pH TANK SUBMERSIBLE MIXERS
SITE CONTRACTOR INSTALL ONLY

2 REQUIRED

FLYGT MODEL 2640-042115SJ/ 2.3HP
480 VOLT, 3 PHASE, 60 HZ

MIXER TO ALL STAINLESS STEEL AND FURNISHED WITH STAINLESS STEEL MOUNTING HARDWARE AND LIFTING CABLE; STAINLESS STEEL GUIDE RAILS TS2x2x1/4" FURNISHED AND INSTALLED BY THE SITE CONTRACTOR.

MINIMUM PUMPING CAPACITY 3,200 GPM TO PRODUCE A 2 FPS SCOUR VELOCITY IN THE TANK CORNERS.

pH METERS

(3) REQUIRED

TBI BAILEY DIVISION OF ABB
METER MODEL TB84-PH
WITH 2 ANALOG OUTPUTS;
3 RELAYS AND PANEL MOUNT KIT

PROBES MODEL TB551 1 2 B 04 F30
FLAT GLASS PROBE WITH SUBMERSIBLE GUARD 3 Lohm EXT CABLE CONNECTOR
TEFLON COATED WOOD REFERENCE
RYTON BODY
BNC CONNECTOR
30 FEET OF CABLE

A pH PROBE SHALL BE MOUNTED IN EACH Ph CONTROL TANK WITH THE METER MOUNTED IN A NEMA 4 ENCLOSURE IN THE BUILDING

THE THIRD PROBE SHALL BE MOUNTED IN THE SAMPLING MANHOLE IN WELL PROVIDED IN THE FLUME. THE METER SHALL BE MOUNTED IN A NEMA 4 ENCLOSURE IN THE SAMPLER ENCLOSURE NEXT TO THE SAMPLING MANHOLE

METERING PUMPS AND TUBING

(2) ACID PUMPS
(2) BASED PUMPS

THE PUMPS SHALL BE LMI MODEL B941-312S
THE PUMPS SHALL BE 120 V, 1 PHASE
PVDF HEADS, CERAMIC BALLS, AND PVDF/ PROPEL CHECK VALVE;

EACH PUMP SHALL BE FURNISHED WITH A FOUR FUNCTUION VALVE, A FOOT VALVE; AN INJECTION VALVE AND A SS WALL MOUNTING BRACKET.

ALL COMPONENTS SHALL BE INTERCHANGEABLE AND ALL COMPONENTS SHALL BE COMPATIBLE FOR USE WITH 93% SUFURIC ACID OR 50% CAUSTIC SODA.

ALL TUBING SHALL BE 1/2" OD POLYPROPLYENE WITH POLYPROPYLENE FITTINGS

FLOW METER

(1) REQUIRED

THE FLWO METER SHALL BE AN AMERICAN SIGMA 950 FLOW METER WITH A ULTRASONIC SENSOR

THE METER SHALL BE MOUNTED IN A NEMA 4 ENCLOSURE AND MOUNTED IN THE SAMPLER ENCLOSURER.

THE METER SHALL HAVE 30 LF OF CONNECTION CABLE FROM THE MOUNTING LOCATION TO THE METER.

THE METER SHALL HAVE OUTPUTS FOR A MODEM, A 4-20 MA OUTPUT TO A DATALOGGER AND RS232 FOR CONNECTION DIRECTLY TO A COMPUTER.

FLOW SAMPLER

(1) REQUIRED

THE FLOW SAMPLER SHALL BE AN AMERICAN SIGMA MODEL 900 REFRIGERATED SAMPLER.

THE UNIT SHALL BE A MICROPROCESSOR BASED FLOW SAMPLER TO TAKE EITHER TIMED SAMPLES OR FLOW PROPORTIONAL SAMPLES. THE SAMPLER SHALL BE FURNISHED WITH TWO 6 GALLON PE SAMPLE BOTTLES FOR COMPOSITE SAMPLES AND TWO SETS OF (24) LITER BOTTLES FOR DISCREET SAMPLES. THE APPROPRIATE ACCESSORIES SHALL BE FURNISHED WITH EACH MODE OF OPERATION.

THE SAMPLER SHALL BE CONNECTED TO THE FLOW METER VIA A VENDOR SUPPLIED CONNECTOR TO TRANSMIT A PULSE SIGNAL BASED ON A VARIBLE FLOW SIGNAL.

SAMPLING MANHOLE AND FLUME
SITE CONTRACTOR INSTALL ONLY

(1) REQUIRED

THE SAMPLING MANHOLE SHALL BE AS MANUFACTURED BY PLASTI-FAB. THE UNIT SHALL BE FURNISHED COMPLETE WITH MOLDED FRP 60° EXTRA LARGE TRAPAZOIDAL FLUME WITH STAINLESS STEEL MOUNTING FOR THE FLOW METER SENSOR, A 1/2" OD SS TUBE FOR THE SAMPLER SUCTION, AND A WELL FOR THE pH PROBE (WELL TO SELF SCOURING).

THE FLUME SHALL HAVE A DEPTH OF FLOW GAGE MOLDED INTO THE FLUME. THE GAGE SHALL READ IN DECIMAL FEET TO THE NEAREST 0.01 FOOT.

THE FLUME SHALL BE LEVELED PER THE MANUFACTURER'S INSTRUCTIONS. THE LEVEL POINTS SHALL BE MARKED ON THE FLUME FLANGE AT THE FACTORY.

THE UNIT SHALL BE AS SHOWN IN THE DETAIL BELOW.

FRP ENCLOSURE
SITE CONTRACTOR INSTALL ONLY

(1) REQUIRED

THE FLOW METERING AND SAMPLING SYSTEM SHALL BE HOUSED IN A FRP ENCLOSURE AS MANUFACTURERED BY AMERICAK SIGMA. THE ENCLOSURE SHALL BE MODEL 6989.

THE UNIT SHALL BE 45 INCHES SQUARE AT THE BASE AND 74 INCHES TALL WITH DOOR AND HOLD OPEN DEVICE.

THE ENCLOSURE SHALL HAVE TWO 120 VOLT DUPLEX OUTLETS; ELECTRIC UNIT HEATER WITH THERMOSTAT, EXHAUST FAN WITH THERMOSTAT AND LIGHTS WITH SWITCH.

THE BACK WALL SHALL A 3/4" THICK PLYWOOD BACKER BOARD FOR MOUNTING THE FLOW METER AND THE pH METER ENCLOSURE. THE BACKER BOARD SHALL BE MOLDED INTO THE FRP WALL.

THE ENCLOSURE EXTERIOR SHALL BE A BEIGE COLOR.

THE ENCLOSURE SHALL BE MOUNTED ON A 5' SQUARE PAD BY THE SITE CONTRACTOR.

BASE STORAGE TANK

(1) REQUIRED

THE TANK SHALL BE AS MANUFACTURERED BY POLYPROCESS

THE TANK SHALL BE 4.0' FT IN DIAMETER BY 9' 6" WITH A CAPACITY OF 805 GALLONS.

THE TANK SHALL BE DESIGNED AND FABRICATED FOR USE WITH 50% SULFUIRC ACID AND SHALL BE MADE OF HIGH DENSITY CROSSLINKED POLY-ETHYLENE.

THE TANK SHALL HAVE 2" FLANGED, 316 STAINLESS STEEL BOTTOM OUTLET WITH A 1 1/2" THD REDUCER.

THE TANK SHALL HAVE A 19" MANWAY IN THE TOP PLUS A 4" VARIBLE FLANGED PVC VENT AND A 2" VARIABLE FLANGED PVC INLET.

ACID STORAGE TANK

(1) REQUIRED

THE TANK SHALL BE AS MANUFACTURERED BY POLYPROCESS

THE TANK SHALL BE 4.0' FT IN DIAMETER BY 9' 6" WITH A CAPACITY OF 805 GALLONS.

THE TANK SHALL BE DESIGNED AND FABRICATED FOR USE WITH 93% SULFUIRC ACID AND SHALL BE MADE OF HIGH DENSITY CROSSLINKED POLY-ETHYLENE AND A OR-1000 OXIDATION RESISTANT LINER.

THE TANK SHALL HAVE 2" FLANGED, 316 STAINLESS STEEL BOTTOM OUTLET WITH AN 1 1/2" REDUCER.

THE TANK SHALL HAVE A 19" MANWAY IN THE TOP PLUS A 4" VARIBLE FLANGED PVC VENT AND A 2" VARIABLE FLANGED PVC INLET.

GREASE TRAP
BY SITE CONTRACTOR

(1) REQUIRED

TANK TO BE PRECAST CONCRETE AND SHALL BE DESIGNED AND CONSTRUCTED TO HAVE A H-20 HIGHWAY LOADING; THE TANK DIMENSIONS MAY VARY EXCEPT THAT THE VOLUME SHALL NOT BE LESS THAN THAT SHOWN ON THE DRAWING. TANK TO BE LEVELED +/- 1/16" OVER LENGTH.

TANK TO HAVE BILCO ALUMINIUM HATCHES CAST INTO THE TOP; HATCHES TO BE FLUSH WITH TOP AND HAVE A 75 PSF LIVE LOAD CAPACITY.

WALL PENETRATIONS TO HAVE BOOT TYPE MECHANICAL SEAL; TOP PENETRATIONS TO HAVE PVC SLEEVE WITH LINK SEAL MECHANICAL SEAL, SLEEVE TO BE 2 PIPE SIZES LARGE THAN PIPE. DETAILS OF THE MECHANICAL SLEEVES PER CONCRETE SYSTEMS INC STANDARD DETAILS.

FLOAT SWITCHES

(2) REQUIRED

THE FLOAT SWITCHES SHALL BE FLYGT MODEL ENH-10 WITH 50 FEET OF CABLE.

EACH CHEMICAL TANK SHALL HAVE A LOW LEVEL FLOAT SWITCH TO ACTIVATE A LOW LEVEL ALARM.

THE CABLE FOR THE SWITCHES SHALL ENTER THE TANK FROM THE TOP.

pH CONTROL TANK
BY SITE CONTRACTOR

(1) REQUIRED

TANK TO BE PRECAST CONCRETE AND SHALL BE DESIGNED AND CONSTRUCTED TO HAVE A H-20 HIGHWAY LOADING; THE TANK DIMENSIONS MAY VARY EXCEPT THAT THE VOLUME FOR EACH MIXING AREA SHALL NOT BE LESS THAN THAT SHOWN ON THE DRAWING. TANK TO BE LEVELED +/- 1/16" OVER LENGTH.

TANK TO HAVE BILCO ALUMINIUM HATCHES CAST INTO THE TOP; HATCHES TO BE FLUSH WITH TOP AND HAVE A 75 PSF LIVE LOAD CAPACITY.

WALL PENETRATIONS TO HAVE BOOT TYPE MECHANICAL SEAL; TOP PENETRATIONS TO HAVE PVC SLEEVE WITH LINK SEAL MECHANICAL SEAL, SLEEVE TO BE 2 PIPE SIZES LARGE THAN PIPE. DETAILS OF THE MECHANICAL SLEEVES PER CONCRETE SYSTEMS INC STANDARD DETAILS.

OPERATION

FIRST STAGE

THE FIRST STAGE TANK HAS 3433 GAL CAPACITY AND HAS A DESIGN RETENTION TIME OF 15 MINUTES AT PEAK FLOW.

THE pH SENSOR WILL SEND A 4-20 MA SIGNAL TO BOTH THE ACID AND BASE METERING PUMPS FOR THE FIRST STAGE. AT A pH OF 9.0, THE ACID PUMP WILL BE ENERGIZED AND BEGIN PUMPING. THE PUMP SPEED WILL BE INCREASED PROPORTIONATELY AS THE pH RISES UNTIL THE PUMP IS A 100% SPEED AT A pH OF 14.

SIMILARLY THE BASE PUMP WILL BE ENERGIZED AT A pH OF 6.0 AND WILL INCREASE IN SPEED TO 100% AS THE pH FALLS TO 1.0.

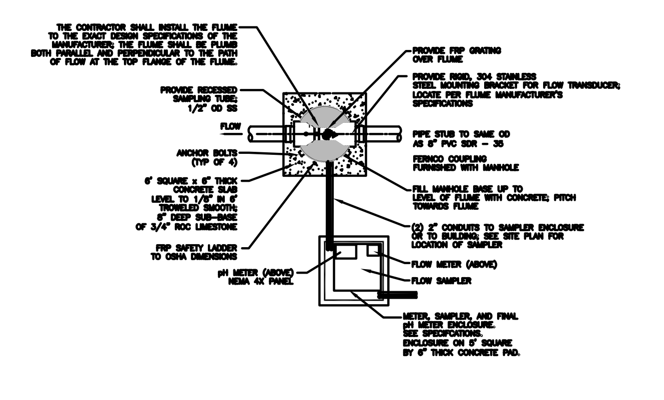
SECOND STAGE

THE SECOND STAGE ALSO HAS A pH METER AND ACID AND BASE METERING PUMPS THAT ARE PROGRAMMED EXACTLY AS THE FIRST STAGE.

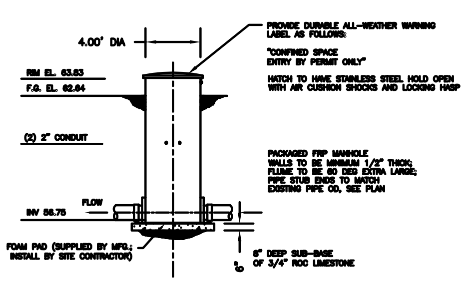
FINAL STAGE

A pH SENSOR AND METER ARE PROVIDED IN THE SAMPLING MANHOLE TO MEASURE AND RECORD THE PERFORMANCE OF THE pH CONTROL SYSTEM.

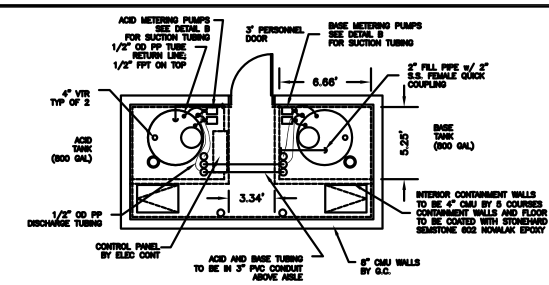
AN ELECTRNIC DATALOGGER IS PROVIDED TO RECORD ALL THREE pH READINGS, THE FLOW RATE, TOTALIZED FLOW AND EFFLUENT TEMPERATURE.



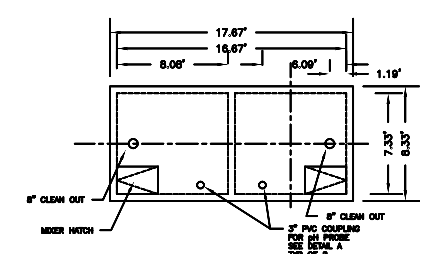
PLAN VIEW – SAMPLING MANHOLE
SCALE 1" = 4'



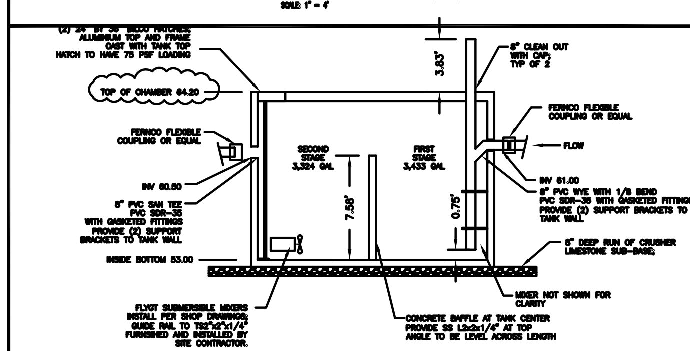
ELEVATION VIEW – SAMPLING MANHOLE
SCALE 1" = 4'



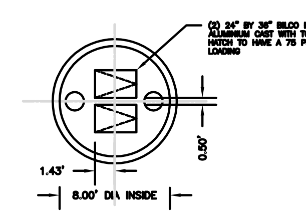
PLAN VIEW – pH EQUIPMENT
SCALE 1" = 4'



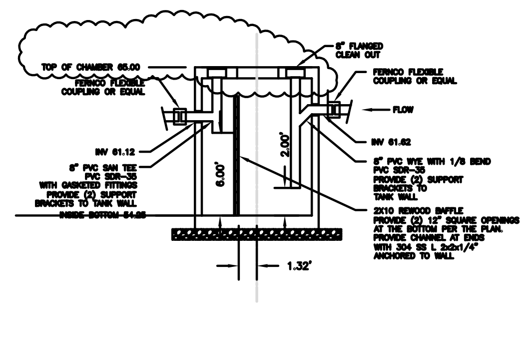
PLAN VIEW – PH TANKS (TOP)
SCALE 1" = 4'



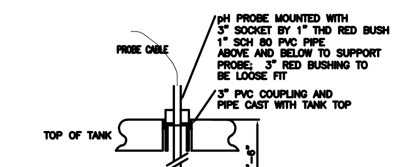
SECTION VIEW – PH TANKS
SCALE 1" = 4'



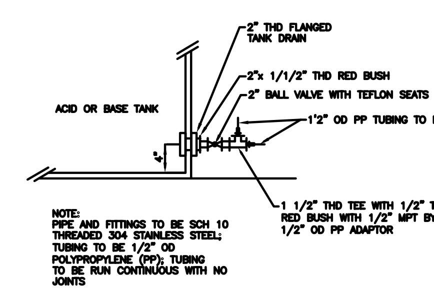
PLAN VIEW – GREASE TRAP
SCALE 1" = 4'



SECTION VIEW – GREASE TRAP
SCALE 1" = 4'



DETAIL A – pH PROBE MOUNTING
NOT TO SCALE



NOTE:
PIPE AND FITTINGS TO BE SCH 10 THREADED 304 STAINLESS STEEL; TUBING TO BE 1/2" OD POLYPROPYLENE (PP); TUBING TO BE RUN CONTINUOUS WITH NO JOINTS

DETAIL B – TANK PIPING (TYP OF 2)
NOT TO SCALE

REL.	DATE	BY	APP.	DESCRIPTION
D	14 APR 03	JMK	JMK	REVISE GT AND pH TANK TOPS
C	11.18.02	RJP	JMK	RELEASED FOR CONSTRUCTION
B	10.17.02	RJP	JMK	GENERAL REVISIONS
A	10.15.02	RJP	JMK	RELEASED FOR WASTE WATER PERMIT

Häns Kissle
Haverhill Facility
Fiber Tech Park
Research Drive
Haverhill, Massachusetts

WASTE TREATMENT DETAILS

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DRAWING NO.
W1.1