

BOARD OF COMMISSIONERS
MICHIGAN CITY SANITARY DISTRICT

RESOLUTION NO. #1306-12

APPROVING STANDARD SPECIFICATIONS FOR LIFT STATION IMPROVEMENTS

WHEREAS, there are times when engineers are required to design lift stations and associated items for sewer system improvements that will become a part of the Michigan City Sanitary District's (MCSD) facilities when fully constructed; and

WHEREAS, based on the recommendation of MCSD management, and MCSD's attorney, James B. Meyer, the Board of Commissioners finds that having and implementing standard specifications for the design of such lift station improvements will decrease costs and increase efficiency of operations for MCSD; and

WHEREAS, the Board finds that it will be a benefit to MCSD and the City of Michigan City if standard specifications for the for such lift station improvements are adopted for MCSD.

NOW, THEREFORE, BE IT RESOLVED by the Board of Commissioners (Board) of the Michigan City Sanitary District (District) that the standard specifications attached hereto as Exhibit A are hereby approved and required to be used for the design and construction of additions and improvements to lift stations in the District's sewer system. If due to unusual circumstances the use of the standard specifications are found and documented by the General Manager to cause the unreasonably excessive expenditure of funds, the General Manager may, in his discretion after consultation with the City Engineer and District's attorney, waive compliance with the standard specifications but must give a written report to the Board as to which specifications were waived and the excessive cost avoided by waiving compliance with the standard specifications.

Approved and adopted the 3rd day of October, 2012.

BOARD OF COMMISSIONERS
MICHIGAN CITY SANITARY DISTRICT

BY: 
Phil Jankowski, President

ATTEST: 
Keith Harris, Secretary


James B. Meyer, MCSD Attorney



STANDARD LIFT STATION NOTES
(Approved 10/3/2012)

1. The electric service, electrical controls, the natural gas service (if required), and the telemetry monitoring system for the lift station shall be provided by the contractor. All coordination with these utility companies and the cost of their fees, permits and installation work shall be the responsibility of the contractor.
2. All electrical work shall be performed in accordance with the National Electrical Code (NEC), all local electric codes and the requirements of the electrical utility, NIPSCO.
3. The location of all buried electrical conduit shall be marked with continuous plastic tape, a minimum of 6 inches wide and 4 mils thick and buried directly above the conduit, approximately 8 inches below finished grade.
4. The lift station contractor shall meet on-site with Michigan City Sanitary District (MCSD) officials and the engineer at the following lift station construction stages: (1) prior to beginning, (2) at 50% completion, (3) at substantial completion start-up and (4) at 100% completion of the lift station. Prior to scheduling the substantial completion start-up with MCSD officials, the contractor shall fully start-up all lift station equipment. MCSD officials will issue a letter of acceptance at 100% completion upon compliance with any "punch list" of items to be completed, which was generated at the substantial completion start-up of all lift station equipment, or thereafter.
5. The contractor shall furnish the MCSD with one (1) digital and four (4) hard copies of the following documents: (a) lift station operation and maintenance manual, with complete detailed information on all lift station equipment and components and a first page summary sheet or index which clearly indicates the contents of the manual all referenced and marked by numbered tabs; (b) as-built construction drawings of the lift station, including a site plan, with state plane coordinates and NGVD88 elevation data for rims and inverts of wet well, other manholes, and connecting sewers; (c) lift station start-up procedure and results check list; and (d) parts list.
6. The following lift station equipment shall be provided:

EXHIBIT A

A. Submersible pumps, minimum 3 HP (2.7 HP) and complete pump controls by ABS Pumps, Inc. or approved equal.

B. If a permanent generator is required for emergency electrical power supply, it shall be natural gas powered and with an automatic transfer switch with adjustable time delay, all by Onan Corp., Generac Corp., Caterpillar Corp. or approved equal

C. Electrical power for the lift station shall be 240/480 volt, 3-phase, depending on the available power supply and the requirements of the lift station equipment. If an electrical phase converter is required for 3 phase electrical power supply, it shall be a static type by Ronk Electrical Industries, or approved equal, and shall be sized for the proper HP rating.

D. The portable generator receptacle, if required, shall have an A/B switch or knife switch, which shall be mounted on the bottom right-hand corner of the switch enclosure, facing downward, matching the available power supply and shall be one of the following:

1. Hubbell 560B9W for 240 volt, 3-phase for KW/KVA less than 65/81
2. Hubbell 460B7W for 480 volt, 3-phase for KW/KVA less than 65/81
3. Appleton AR20044 for 480 volt, 3-phase for KW/KVA greater than 288

E. Permanent stainless steel chains for the installation and removal of each pump on its guide rail system. Each chain shall have sufficient strength and length to reach from each pump to at least four (4) feet above the top of the lift station wet well. Each chain shall be secured on a stainless steel hook bolt, anchored to the top slab of the wet well, in the pump access opening.

F. The pump level control and control transmission system shall include a pressure transducer in the wet well, an Ametek Model 575, complete with 50 feet of cable to extend to the electronic unit without splicing. The electronic unit shall be located in the station control panel.

G. The preceding electronic unit in Item 6(F) shall include one 24"x24"x8" NEMA 4X fiberglass enclosure, provided complete with a swing-out front panel. The swing-out front panel shall include an SJE Rhombus SP6R-LSC Level Controller which shall be programmable to start-stop the pumps at the wet well levels indicated on the drawings. A digital display shall be included to display the wet well levels.

H. The rear of the electronic unit enclosure shall include a Mission M800 Real Time RTU, provided by J.M. Process Equipment Co., telephone number 708-429-3040, and with card addition capability for eight (8) digital inputs (DI) and two (2) analog inputs (AI). The Mission M800 shall transmit the following signals to the Sanitary District of Michigan City.

AI-1 Wet Well Level

EXHIBIT A

DI-1	Pump 1 Run/Off
DI-2	Pump 2 Run/Off
DI-3	Pump 1 Fail/Normal
DI-4	Pump 2 Fail/Normal
DI-5	Low Wet Well Level/Normal
DI-6	High Wet Well Level/Normal
DI-7	Power Fail
DI-8	Float Control

Also included in the 24"x24"x8" electronic unit enclosure shall be a UPS, power fail relay, 24 VDC power supply, lightning arrestor, condensation heater with thermostat, terminal blocks, circuit breaker, receptacle, and GFI.

All alarms shall be automatically self-correcting (alarm condition is removed when event that triggers alarm is corrected). Pump failure shall be monitored through the motor starters with isolated contacts. The M800 and pressure transducer shall be provided with battery back-up to send water level data to the plant in the event of a power failure

I. Provide two (2) mercury-free float switches, each with 50 ft. of cable to extend to the electronic unit with no splicing of cables allowed. The floats shall be utilized to start and stop the "lead" and "lag" pumps in the event of a failure of the level transmitter or controller and to alarm the failure at the elevations indicated on the drawings. The pump controls shall prevent the simultaneous start of both pumps under this situation

J. The pump level control floats shall have sufficient weight to hang freely, without intermediate support, from stainless steel supports that are secured to the wet well wall, just below the top slab of the wet well. The transducer shall be attached to a 1/8" 316 stainless steel cable and 316 stainless steel clamps. A weight shall be attached at the bottom of cable and transducer and shall be attached just above the weight near the bottom of the wet well.

K. Supplier(s) of the pump station control system shall provide one day of supervisory startup service to insure proper operation of the system.

L. If Variable Frequency Drives (VFD) for pump motors are required, they shall be of appropriate make, type and size for this application.

Approved equal in the preceding items shall mean by another manufacturer that is approved prior to bidding the project. This pre-bid approval shall involve a submittal for the engineer's review and recommendation, and final approval by MCSD officials, which verifies that the manufacturer has acceptable experience and the equipment meets specifications, operating conditions and installation requirements.

EXHIBIT A

7. The pump controls shall be provided by the pump manufacturer and shall include the following:

A. A NEMA 3R stainless steel enclosure with outside solid door and an inside door with instrumentation mounting. The control panel shall be designed to conveniently hold the outside door in a 180 degree fully open position and the inside instrument door in a 120 degree open position.

B. The following starting and overload protection facilities for each pump:

1. A combination NEMA rated motor starter and circuit protector to provide short circuit protection per NEC code.
2. A manual reset for dual protection against current overloads and short circuits.
3. An overload relay to be pre-calibrated to match motor characteristics.
4. A hand/off/auto selector switch mounted on the inside door of the control enclosure.

C. Thermal overload protection shutoff switches, restart buttons and warning lights for each pump.

D. A 20 amp 115 volt GFI receptacle in the pump control system enclosure.

E. Run and moisture sensor warning lights for each pump mounted on the inside door of the control enclosure.

F. A separate circuit breaker for the pump control system.

G. Lightning/surge protection for the entire pump control system.

H. A 100 watt heater with thermostat and over-temperature control for moisture control inside the pump control enclosure.

I. Dry contacts for pump thermal failure.

J. Either a 3-phase electrical supply monitor-or a low electrical voltage monitor, if an electrical phase converter is used for lift station power supply. This monitor shall interrupt power to the pump controls in an electrical supply problem condition.

K. Circuit breakers shall be provided in the pump control panel for the following accessories:

EXHIBIT A

1. Area light
2. GFI receptacle
3. 100 watt heater
4. Controls

8. The lift station accessories shall be provided, as indicated on the details contained on-the drawings and/or specified below and as required:

A. The aluminum hatches for the tops of the lift station wet well and valve vault structures shall be series SIS, as manufactured by Halliday Products or approved equal. The hatches shall be the size indicated, or larger if required, for the easy removal of the wet well pumps or the valve vault valves. Each hatch shall have a recessed slam-lock and 90 degree open holding latch.

B. The area light shall have a 70 watt HP sodium lamp, vandal-proof acrylic prismatic reflector, cast aluminum housing, and integral plug-in photoelectric cell for automatic dusk to dawn operation.

C. All cables and conductors shall be in conduit; schedule 80 PVC for buried and rigid galvanized steel for exposed. All conduit sizes shall be oversized for easy future removal of the cables and conductors and their replacement with the next larger size.

D. Two valve operating T-wrenches shall be provided, one eight (8) feet long and one three (3) feet long, for opening the plug valves in the valve vault from the top of the vault.

9. The lift station piping, fittings and valves shall be provided as indicated on the details contained on the drawing and/or as specified below.

A. The sizes of the piping, fittings and valves for the submersible pump discharge and the emergency pump suction and discharge connections shall be specifically determined for the pump station design capacity.

B. All interior or buried piping shall be class 50 ductile iron.

C. All interior or buried fittings shall be class 250 ductile iron with flanged joints.

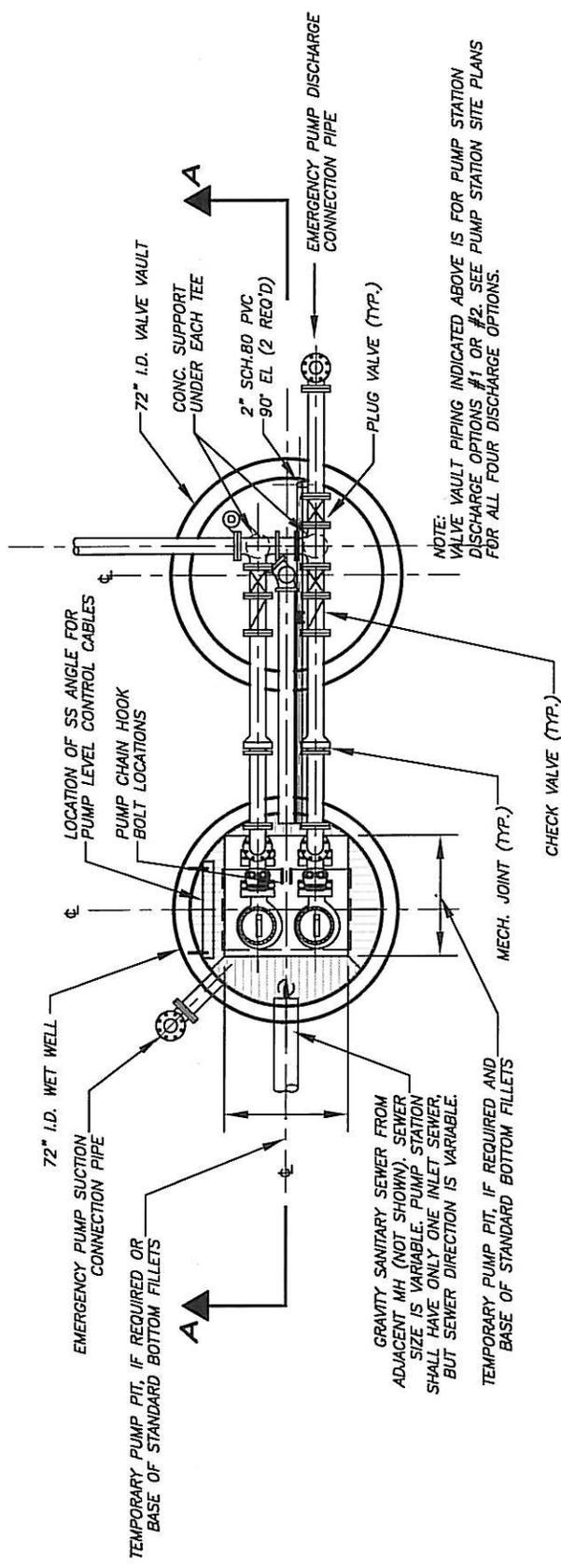
D. Pump discharge check valves shall be swing-check type with outside weighted arm and manufactured in accordance with AWWA specification C508. The check valves shall be ductile iron and have flanged ends as per ANSI B.16.1 Class 125. The valves shall have an access flange for internal valve maintenance, without removing the valve from the pipeline.

EXHIBIT A

E. Pump discharge plug valves shall have eccentric action such that the valve plug rises off the seat during operation. The valve plug shall be neoprene or BUNA-N faced. The plug valves shall be iron or semi-steel and have flanged ends as per ANSI B.16.1 Class 125. Plug valve operators shall be as indicated in the drawing details. Plug valves shall be DeZurick series 100, or equal.

F. All pipe connections to fittings and valves can be with field flanges, Uni-flange or equal.

G. Pump discharge check, plug, and bypass valves shall be located in a separate structure with aluminum hatch. This structure shall have a drain that returns to the wet well with an appropriate trap, as indicated on the drawing.



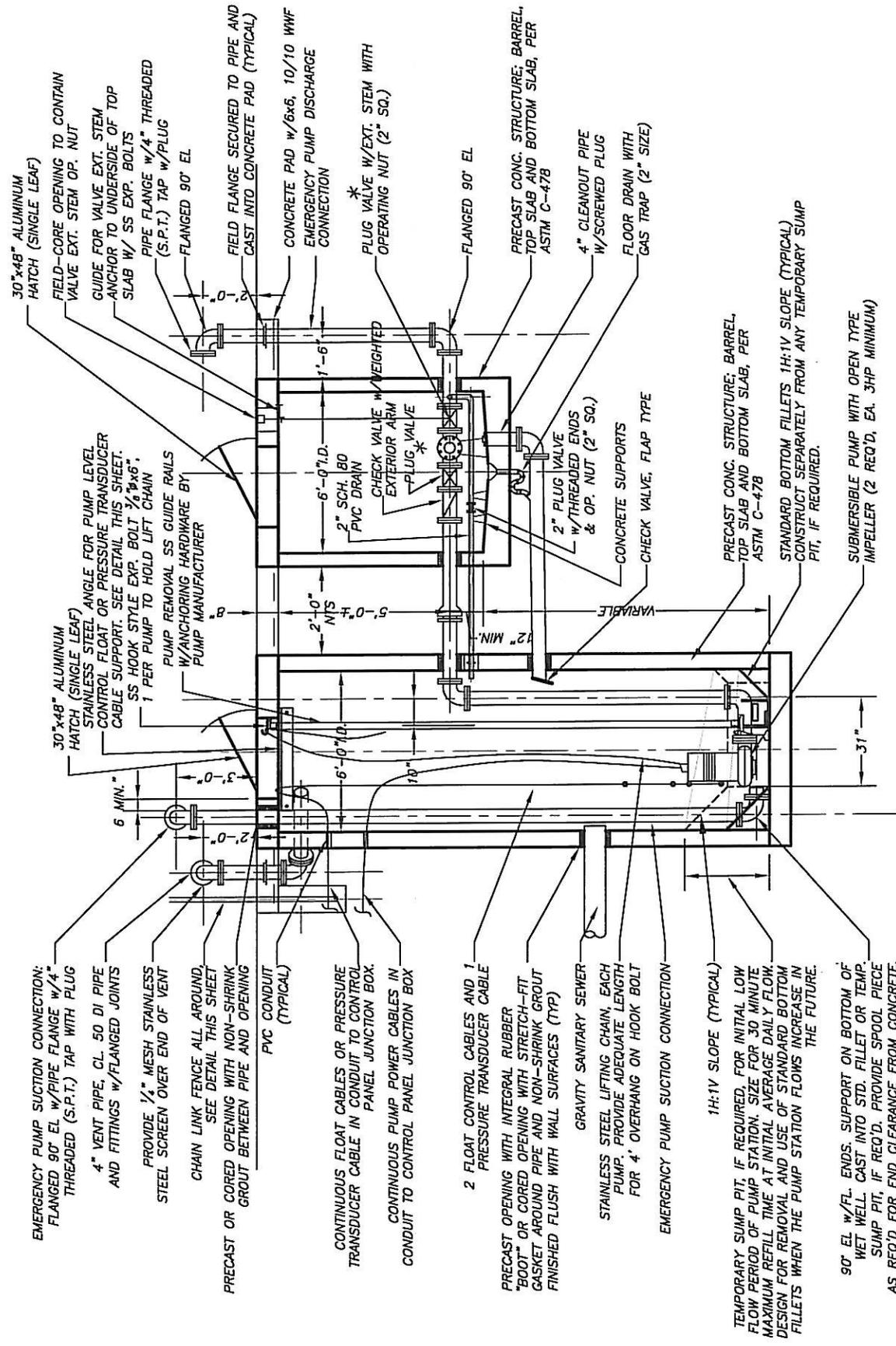
NOTE: VALVE VAULT PIPING INDICATED ABOVE IS FOR PUMP STATION DISCHARGE OPTIONS #1 OR #2. SEE PUMP STATION SITE PLANS FOR ALL FOUR DISCHARGE OPTIONS.

PUMP STATION PLAN

SCALE: 3/16"=1'-0"

LIFT STATION STANDARDS
SANITARY DISTRICT OF MICHIGAN CITY
DRAWING 2 OF 8

SECTION A-A
 SCALE: 3/16" = 1'-0"



EMERGENCY PUMP SUCTION CONNECTION: FLANGED 90° EL. W/PIPE FLANGE W/4" THREADED (S.P.T.) TAP WITH PLUG

4" VENT PIPE, CL. 50 DI PIPE AND FITTINGS W/FLANGED JOINTS

PROVIDE 1/4" MESH STAINLESS STEEL SCREEN OVER END OF VENT

CHAIN LINK FENCE ALL AROUND, SEE DETAIL THIS SHEET

PRECAST OR CORED OPENING WITH NON-SHRINK GROUT BETWEEN PIPE AND OPENING

PVC CONDUIT (TYPICAL)

CONTINUOUS FLOAT CABLES OR PRESSURE TRANSDUCER CABLE IN CONDUIT TO CONTROL PANEL JUNCTION BOX.

CONTINUOUS PUMP POWER CABLES IN CONDUIT TO CONTROL PANEL JUNCTION BOX

2 FLOAT CONTROL CABLES AND 1 PRESSURE TRANSDUCER CABLE

PRECAST OPENING WITH INTEGRAL RUBBER "BOOT" OR CORED OPENING WITH STRETCH-FIT GASKET AROUND PIPE AND NON-SHRINK GROUT FINISHED FLUSH WITH WALL SURFACES (TYP)

GRAVITY SANITARY SEWER

STAINLESS STEEL LIFTING CHAIN, EACH PUMP, PROVIDE ADEQUATE LENGTH FOR 4" OVERHANG ON HOOK BOLT

EMERGENCY PUMP SUCTION CONNECTION

1H:1V SLOPE (TYPICAL)

TEMPORARY SUMP PIT, IF REQUIRED, FOR INITIAL LOW FLOW PERIOD OF PUMP STATION. SIZE FOR 30 MINUTE MAXIMUM REFILL TIME AT INITIAL AVERAGE DAILY FLOW DESIGN FOR REMOVAL AND USE OF STANDARD BOTTOM FILLETS WHEN THE PUMP STATION FLOWS INCREASE IN THE FUTURE.

90° EL. W/FL. ENDS. SUPPORT ON BOTTOM OF WET WELL, CAST INTO STD. FILLET OR TEMP. SUMP PIT, IF REQ'D. PROVIDE SPOOL PIECE AS REQ'D FOR END CLEARANCE FROM CONCRETE.

* 4" VALVES SHALL INCLUDE AN OPERATING NUT (2" SQ.). 6" AND LARGER VALVES SHALL INCLUDE A GEAR OPERATOR WITH AN OPERATING NUT (2" SQ.).

STANDARD BOTTOM FILLETS 1H:1V SLOPE (TYPICAL) CONSTRUCT SEPARATELY FROM ANY TEMPORARY SUMP PIT, IF REQUIRED.

SUBMERSIBLE PUMP WITH OPEN TYPE IMPELLER (2 REQ'D, EA. 3HP MINIMUM)

PRECAST CONC. STRUCTURE; BARREL, TOP SLAB AND BOTTOM SLAB, PER ASTM C-478

CHECK VALVE, FLAP TYPE

PRECAST CONC. STRUCTURE; BARREL, TOP SLAB AND BOTTOM SLAB, PER ASTM C-478

PLUG VALVE W/EXT. STEM WITH OPERATING NUT (2" SQ.)

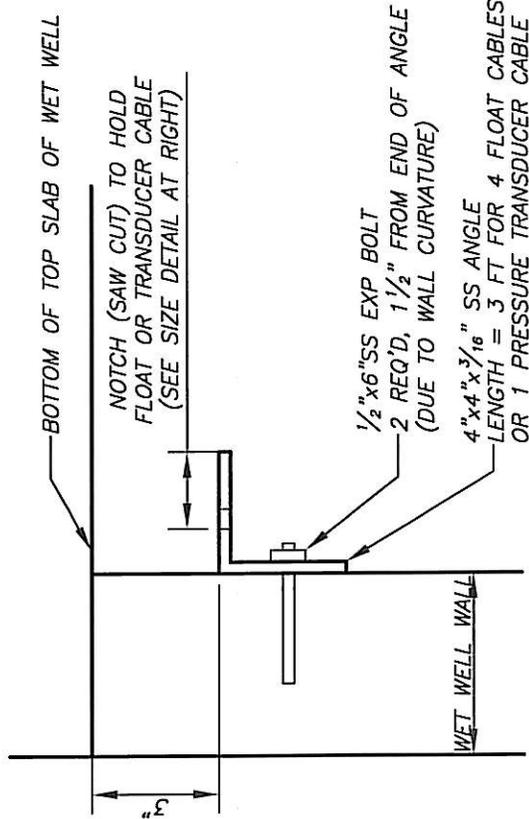
CONCRETE PAD W/6x6, 10/10 WWF EMERGENCY PUMP DISCHARGE CONNECTION

FIELD FLANGE SECURED TO PIPE AND CAST INTO CONCRETE PAD (TYPICAL)

PIPE FLANGE W/4" THREADED (S.P.T.) TAP W/PLUG

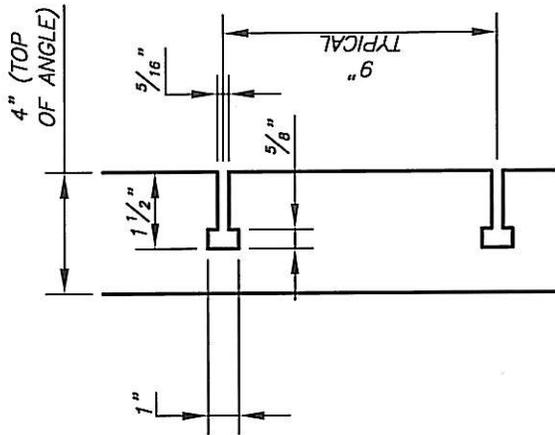
FIELD-CORE OPENING TO CONTAIN VALVE EXT. STEM OP. NUT

30"x48" ALUMINUM HATCH (SINGLE LEAF)



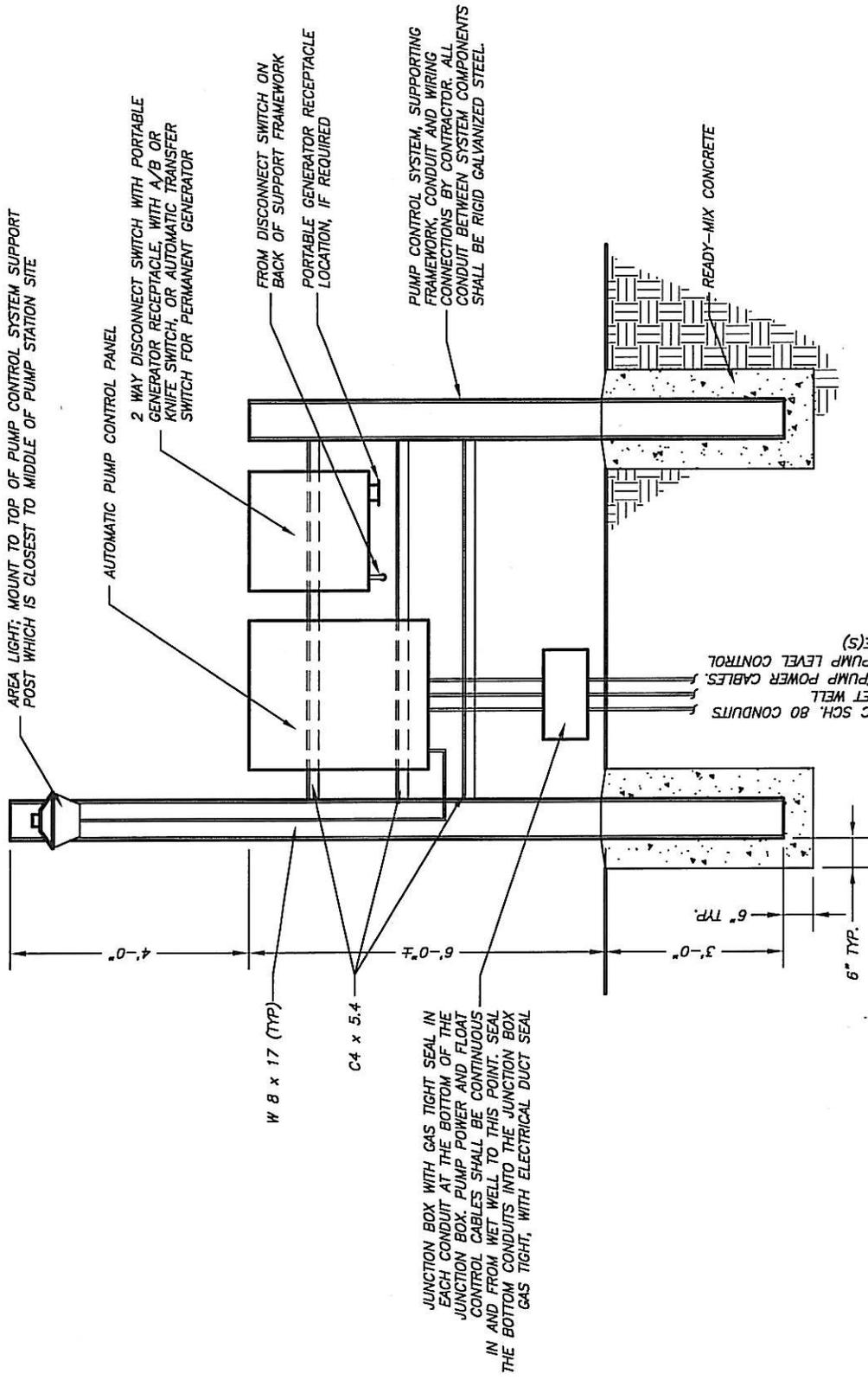
**PUMP CONTROL LEVEL FLOAT OR
TRANSDUCER CABLE SUPPORT**

SCALE: NONE

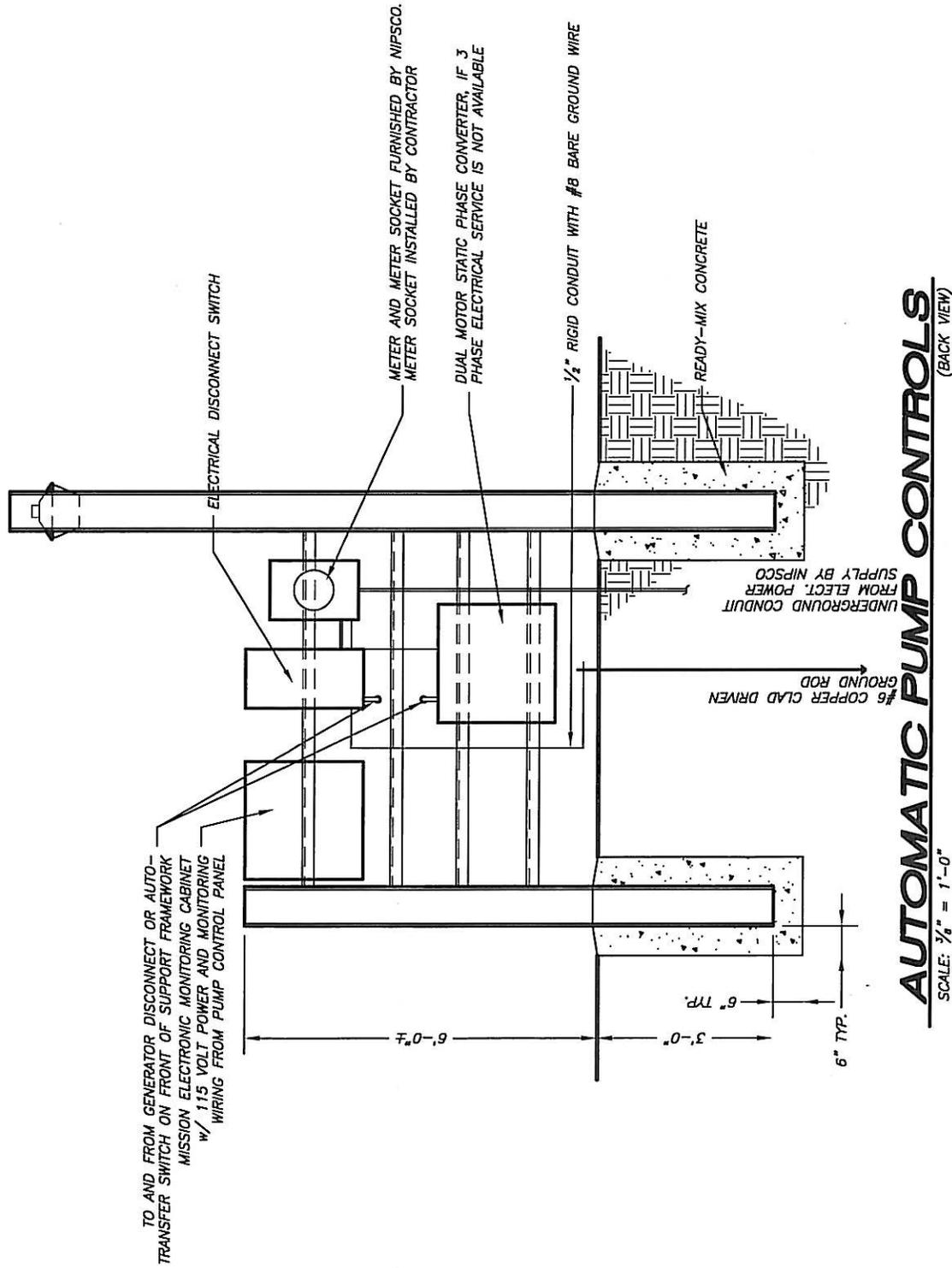


NOTCH PLAN

SCALE: NONE

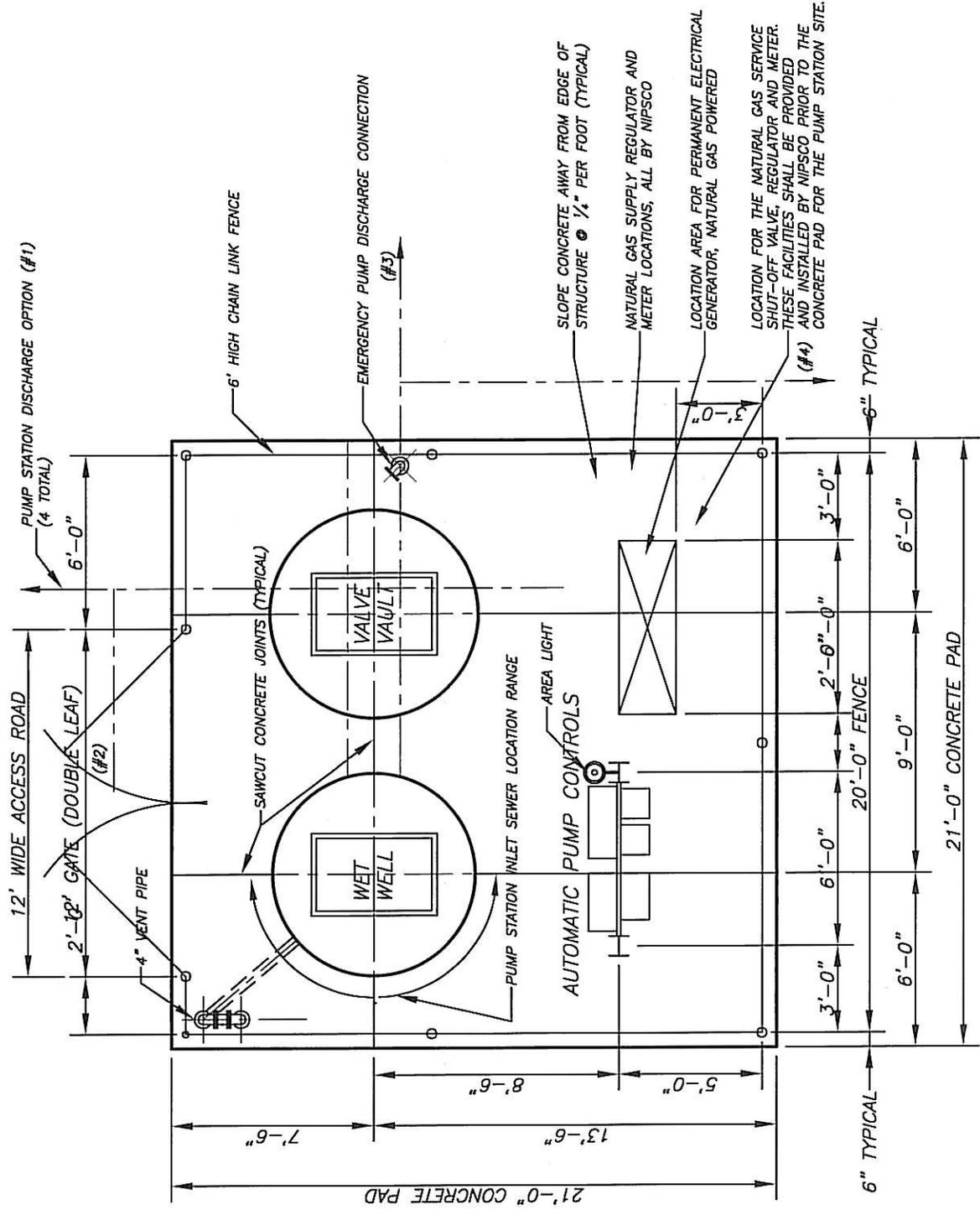


AUTOMATIC PUMP CONTROLS
 SCALE: 3/8" = 1'-0"
 (FRONT VIEW)



AUTOMATIC PUMP CONTROLS

(BACK VIEW)



PUMP STATION SITE PLAN

(MINIMUM SIZE) WITH PERMANENT ELECTRICAL GENERATOR
 SCALE: 3/16" = 1'-0"

LIFT STATION STANDARDS
SANITARY DISTRICT OF MICHIGAN CITY
DRAWING 7 OF 8

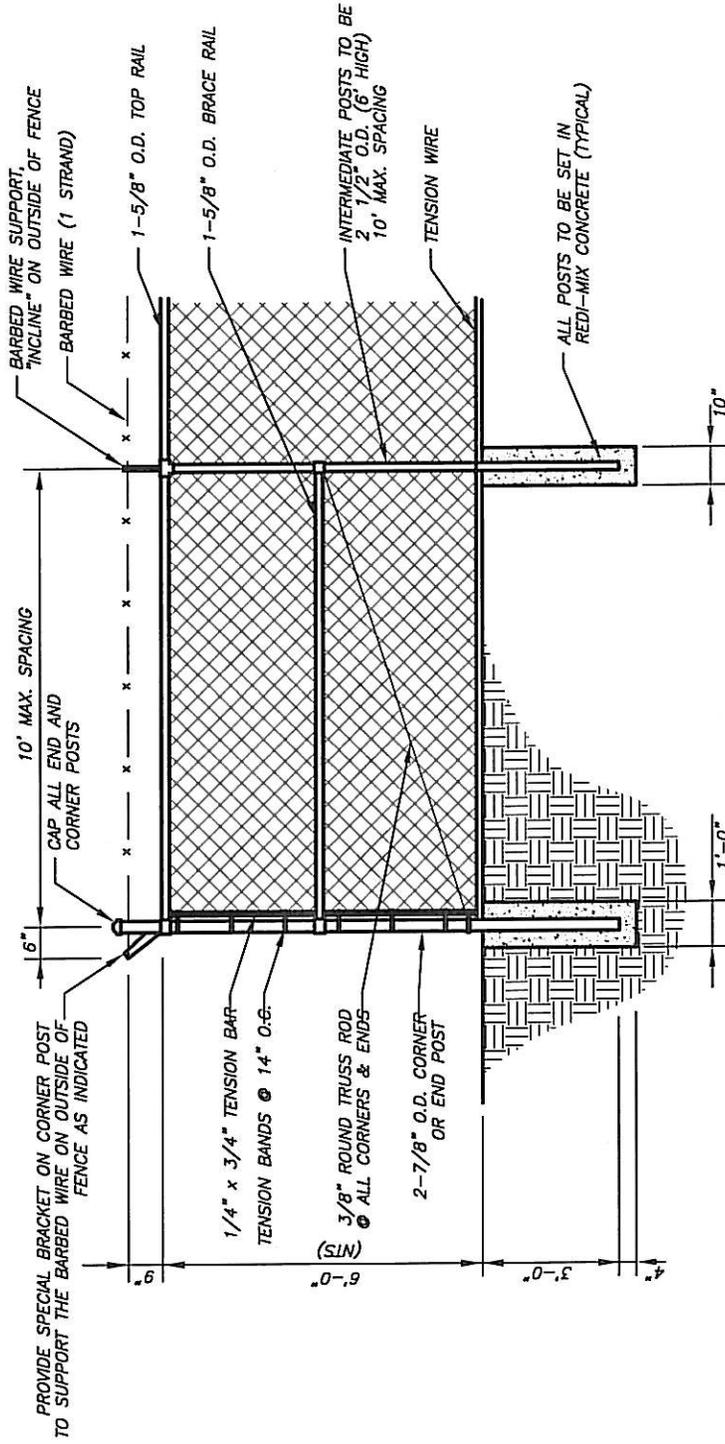
EMERGENCY PUMP DISCHARGE CONNECTION (#3)

SLOPE CONCRETE AWAY FROM EDGE OF STRUCTURE @ 1/4" PER FOOT (TYPICAL)

NATURAL GAS SUPPLY REGULATOR AND METER LOCATIONS, ALL BY NIPSCO

LOCATION AREA FOR PERMANENT ELECTRICAL GENERATOR, NATURAL GAS POWERED

LOCATION FOR THE NATURAL GAS SERVICE SHUT-OFF VALVE, REGULATOR AND METER. THESE FACILITIES SHALL BE PROVIDED AND INSTALLED BY NIPSCO PRIOR TO THE CONCRETE PAD FOR THE PUMP STATION SITE. (#4)



FENCE DETAIL

SCALE: 3/8" = 1'-0"