Planning Considerations for a New Irrigation Pump System

Irrigation ASSOCIATION™

Objectives

- Equipment Sizing
- Site Considerations
- Building Considerations
- Pump System Technology Overview
- Project Timeline
- Case Study From the Superintendent’s POV
- Questions

Panel

Brian Vinchesi – Irrigation Consulting, Inc.

Independent Consulting Engineer (27 years in golf industry)

Bob Sylvester – Watertronics

Manufacturer's (Technology) Representative (28 years in golf industry)

Matt Ceplo - Rockland Country Club, New York

Golf Course Superintendent (20 years)

Equipment Sizing

- Deliver peak daily demand in minimum 6 to 8 hours a night, 6 days per week while providing adequate pressure and water quality.
- Demand

$$\frac{\text{(Irrigated Area) x (Required Depth with respect to time)}}{\text{(Efficiency)}}$$

Depth = Turf Evapotranspiration, ET (i.e., inches per week)

Area = Area of specific turf type (acres or square feet)

Efficiency = 0.65 to 0.80 for current system sprinkler layout

1-inch of water over 1 acre (acre-inch) = 27,154 gallons

Demand Assessment Example

- Fairway Irrigated Area = 55 acres
  - ET = 1.10” per week
- Green Irrigated Area = 3 acres
  - ET = 0.95” per week
- Rough Irrigated Area = 25 acres
  - ET = 1.25” per week
- Tee Irrigated Area = 2.5 acres
  - ET = 0.95” per week
- Sprinkler Application Efficiency is 75%

Fairway Demand

$$\frac{(55 \text{ Acres} \times 1.10 \text{ inches per week} \times 27{,}154 \text{ gallons per ac-in})}{(0.75)} = \textbf{2,190,000 gpw}$$

Green Demand

$$\frac{(3.0 \text{ Acres} \times 0.95 \text{ inches per week} \times 27{,}154 \text{ gallons per ac-in})}{(0.75)} = \textbf{103,185 gpw}$$

Rough Demand

$$\frac{(25 \text{ Acres} \times 1.25 \text{ inches per week} \times 27{,}154 \text{ gallons per ac-in})}{(0.75)} = \textbf{1,131,000 gpw}$$

Tee Demand

$$\frac{(2.5 \text{ Acres} \times 0.95 \text{ inches per week} \times 27{,}154 \text{ gallons per ac-in})}{(0.75)} = \textbf{85,988 gpw}$$

Total Weekly Demand = 3,510,173 gallons

Weekly Operating Period is 6 hours per day, 6 days per week (36 hours) = 2,160 minutes
Weekly Operating Period is 8 hours per day, 6 days per week (48 hours) = 2,880 minutes

Minimum Pump Station Flow = 3,510,173 gallons / 2,160 minutes = 1,625 gpm
Minimum Pump Station Flow = 3,510,173 gallons / 2,880 minutes = 1,219 gpm

Desired Pumping Capacity 6 Hours) = 1,800 gpm
Desired Pumping Capacity 8 Hours) = 1,500 gpm

Horsepower Determination

- HP = $\frac{\text{Flow (gpm) x Pressure (psi)}}{\text{1714 (efficiency)}}$

- Pressure is determined by:
  - Operating Pressure Requirement of Sprinklers
  - Elevation Change from Water Surface to Highest Point
  - Friction Losses Within System Piping

- Efficiency will vary based on:
  - Type of Pump - centrifugal end suction, submersible, turbine
  - Manufacturing Process - tolerances

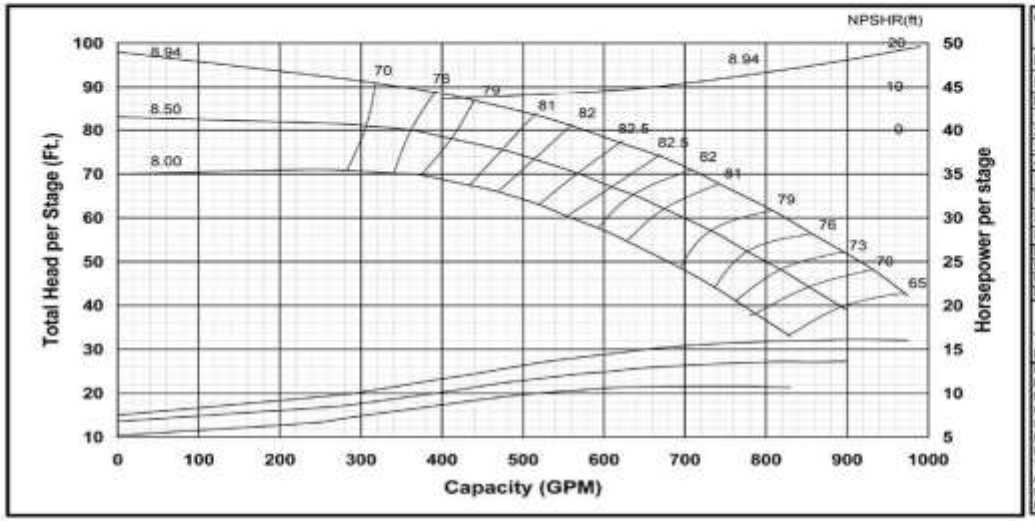
For the Example Provided:

- Source of water for the irrigation system is an irrigation pond at elevation 260’ MSL
- The highest region of the golf course is at 340’ MSL
- Elevation gain is 80 feet
- **2.31 feet of water exerts 1 psi of water pressure**
- 80 feet reduces pressure by (80 feet/2.31feet/psi) = **35 psi**
- Operating Pressure of Sprinklers is 80 psi
- Friction losses within the system is 15 psi.
- Total pressure requirements = 35 psi + 80 psi + 15 psi = **130 psi**

MODEL 12WAMC *(Effective June 1, 2006)*

GOULDS PROPOSAL NO.	GOULDS S.O. NO.	INQUIRY NO.	CUSTOMER P.O. NO.	P.O. DATE	ITEM NO.	CUSTOMER

PROJECT	SERVICE	GPM CAPACITY	FT. TDH	% EFFICIENCY	RPM



Curve No.	E6412WCPC2
Model	12WAMC
RPM	1770
EFFICIENCY CORRECTION	
1-STAGE	-3.0
2-STAGE	-2.0
3-STAGE	-1.0
4-STAGE	0.0
Impeller	ENCLOSED
Ns =	1615
K =	7.0 LBS/FT
K(Bal.)=	N/A
Bowl O.D.	11.60"
Bowl Lateral	0.75"
Max. PSI	390
Disch size	6",8",10"

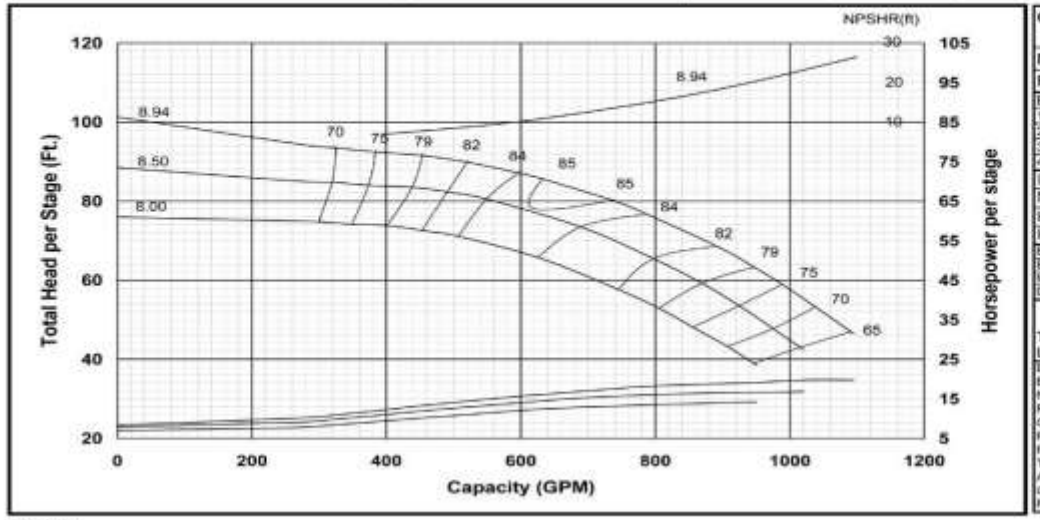
TURBINE OPERATIONS
Lubbock, Texas

BOWL PERFORMANCE CURVE BASED ON PUMPING CLEAR, NON-AERATED WATER. RATED POINT ONLY IS GUARANTEED. CURVES REPRESENT SINGLE STAGE PERFORMANCE BASED ON TEST OF MULTI-STAGE BOWL ASSEMBLY. EFFICIENCY CORRECTION IS REQUIRED FOR LESSER STAGES.

MODEL 12WAHC *(Effective June 1, 2006)*

GOULDS PROPOSAL NO.	GOULDS S.O. NO.	INQUIRY NO.	CUSTOMER P.O. NO.	P.O. DATE	ITEM NO.	CUSTOMER

PROJECT	SERVICE	GPM CAPACITY	FT. TDH	% EFFICIENCY	RPM



Curve No.	E6412WAPC1
Model	12WAHC
RPM	1770
EFFICIENCY CORRECTION	
1-STAGE	-3.0
2-STAGE	-2.0
3-STAGE	-1.0
4-STAGE	-0.5
Impeller	ENCLOSED
Ns =	1720
K =	7.0 LBS/FT
K(Bal.)=	N/A
Bowl O.D.	11.60"
Bowl Lateral	0.75"
Max. PSI	390
Disch size	6",8",10"

TURBINE OPERATIONS
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Horsepower

- Horsepower considers the efficiency of the pumps to determine the power requirement of the pump. Pump efficiency generally ranges from 40 to 85 percent.

- For redundancy, versatility and control system reasons, multiple main pumps are recommended.

- For the example provided, 3 main pumps (600 gpm) would be recommended.

- Based on the pump curve, pump efficiency is 82%. This is for a vertical turbine pump.

- Horsepower of each pump is: $\frac{(600 \text{ gpm} \times 135 \text{ psi})}{(1{,}714 \times 0.82)}$ = **57.63 hp**

- Each main pump shall be **60 hp (Motor Size)**

- Sometimes you may limit the flow to not exceed a specific hp.

- Pressure maintenance pumps shall be sized for just that or also for some hand watering.

- Courses that perform regular and large amounts of hand watering should have a jockey pump also sized for the hand watering demand

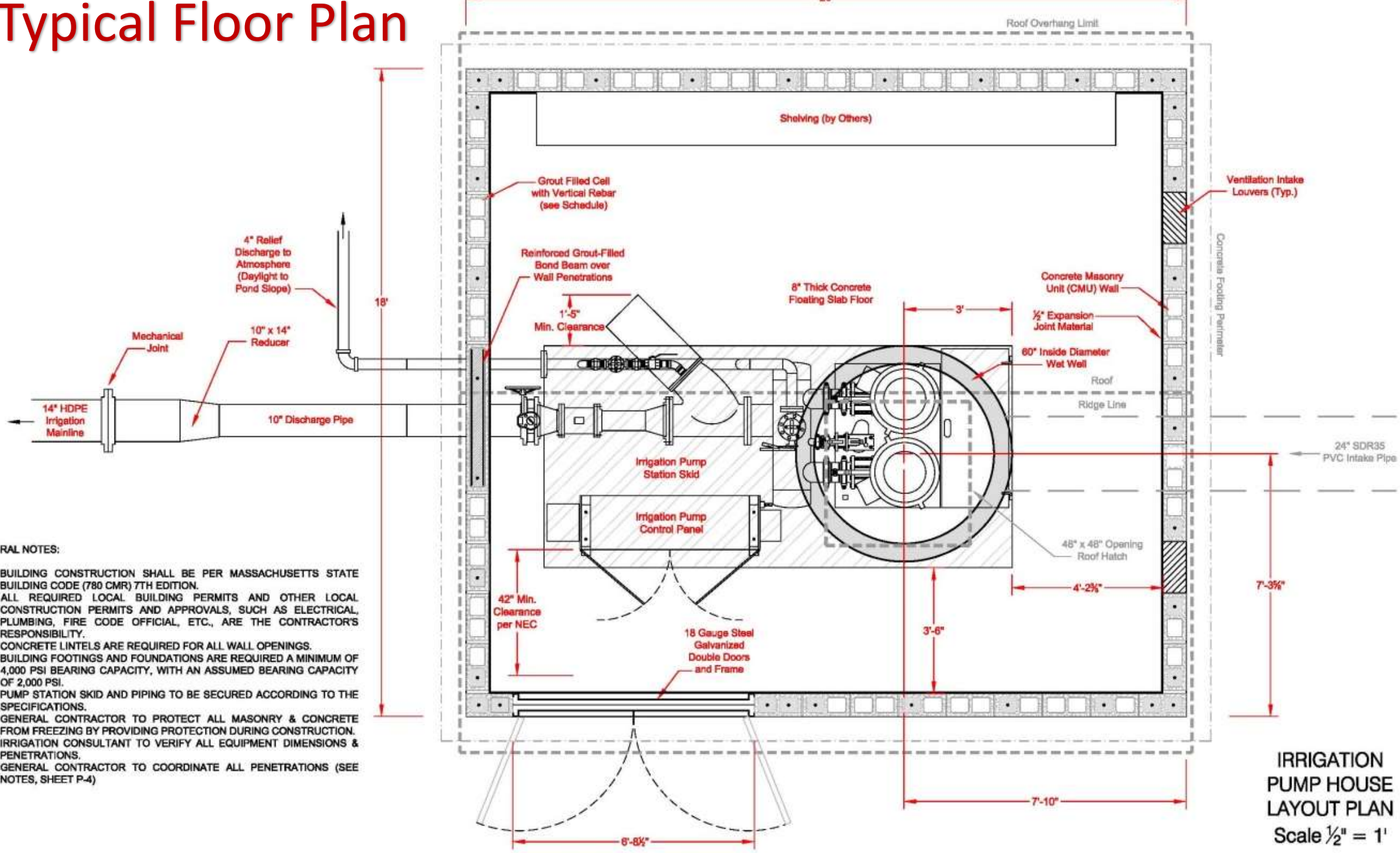
Pump House

- Location/Site
  - Water Supply (potable, non-potable)
  - Vehicular Access
  - Power Supply
  - Proximity to Irrigation System
  - Regulated Resource Areas (wetlands, flood plain)
- Floor Plan Size/Layout
  - Type of Pumps
  - Number of Pumps

Pump House

- Determination of Size
  - Equipment
  - Storage
  - Chemical Spill Containment
- Materials
  - Wood
  - Metal
  - Concrete Masonry Unit (CMU)
  - Modular

Typical Floor Plan



GENERAL NOTES:

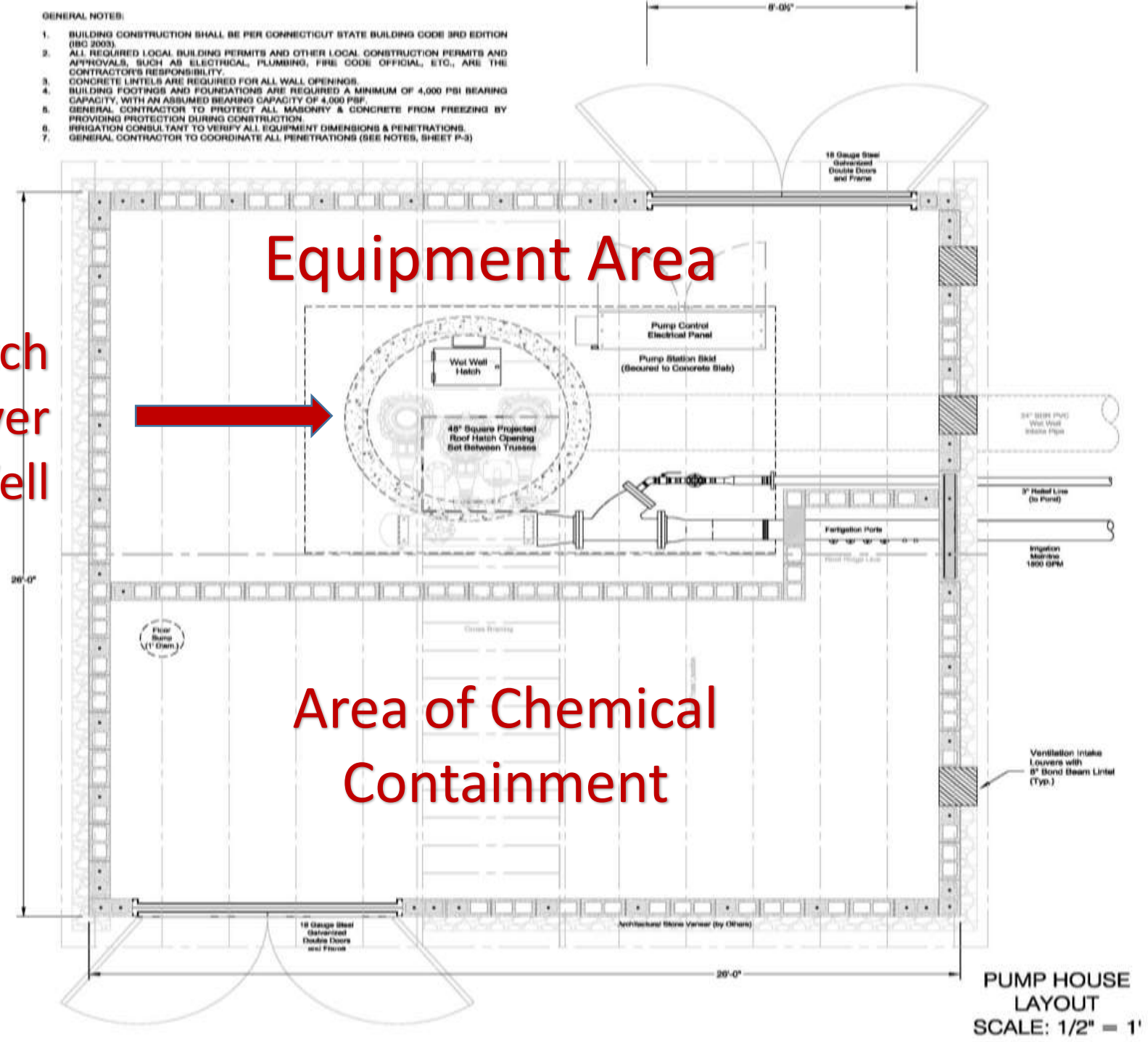
1. BUILDING CONSTRUCTION SHALL BE PER MASSACHUSETTS STATE BUILDING CODE (780 CMR) 7TH EDITION.
2. ALL REQUIRED LOCAL BUILDING PERMITS AND OTHER LOCAL CONSTRUCTION PERMITS AND APPROVALS, SUCH AS ELECTRICAL, PLUMBING, FIRE CODE OFFICIAL, ETC., ARE THE CONTRACTOR'S RESPONSIBILITY.
3. CONCRETE LINTELS ARE REQUIRED FOR ALL WALL OPENINGS.
4. BUILDING FOOTINGS AND FOUNDATIONS ARE REQUIRED A MINIMUM OF 4,000 PSI BEARING CAPACITY, WITH AN ASSUMED BEARING CAPACITY OF 2,000 PSI.
5. PUMP STATION SKID AND PIPING TO BE SECURED ACCORDING TO THE SPECIFICATIONS.
7. GENERAL CONTRACTOR TO PROTECT ALL MASONRY & CONCRETE FROM FREEZING BY PROVIDING PROTECTION DURING CONSTRUCTION.
6. IRRIGATION CONSULTANT TO VERIFY ALL EQUIPMENT DIMENSIONS & PENETRATIONS.
7. GENERAL CONTRACTOR TO COORDINATE ALL PENETRATIONS (SEE NOTES, SHEET P-4)

IRRIGATION PUMP HOUSE LAYOUT PLAN
Scale ½" = 1'

GENERAL NOTES:

1. BUILDING CONSTRUCTION SHALL BE PER CONNECTICUT STATE BUILDING CODE 3RD EDITION (IBC 2003).
2. ALL REQUIRED LOCAL BUILDING PERMITS AND OTHER LOCAL CONSTRUCTION PERMITS AND APPROVALS, SUCH AS ELECTRICAL, PLUMBING, FIRE CODE OFFICIAL, ETC., ARE THE CONTRACTOR'S RESPONSIBILITY.
3. CONCRETE LINTELS ARE REQUIRED FOR ALL WALL OPENINGS.
4. BUILDING FOOTINGS AND FOUNDATIONS ARE REQUIRED A MINIMUM OF 4,000 PSI BEARING CAPACITY, WITH AN ASSUMED BEARING CAPACITY OF 4,000 PSF.
5. GENERAL CONTRACTOR TO PROTECT ALL MASONRY & CONCRETE FROM FREEZING BY PROVIDING PROTECTION DURING CONSTRUCTION.
6. IRRIGATION CONSULTANT TO VERIFY ALL EQUIPMENT DIMENSIONS & PENETRATIONS.
7. GENERAL CONTRACTOR TO COORDINATE ALL PENETRATIONS (SEE NOTES, SHEET P-3)

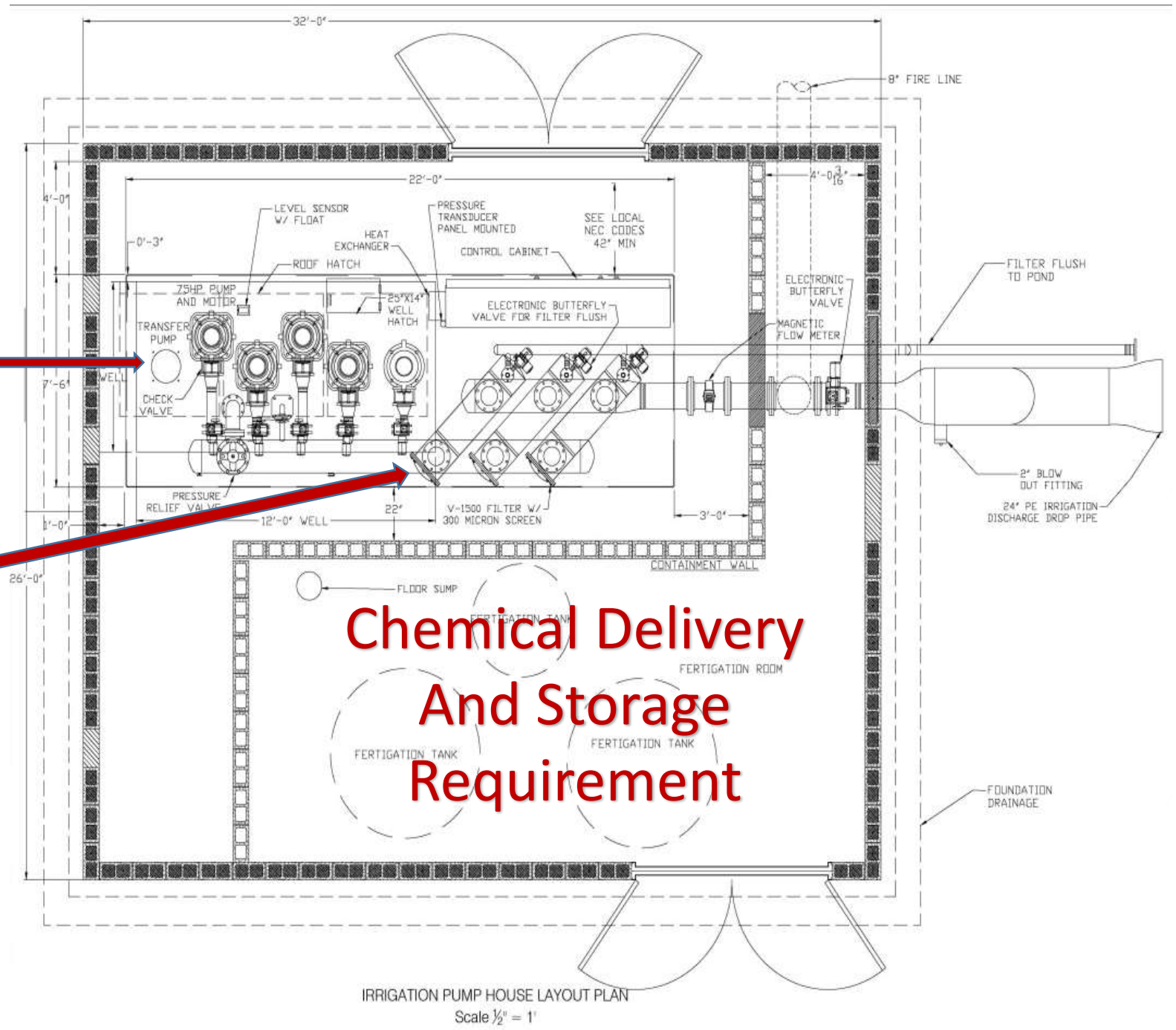
Pump Service Hatch Required Over Wet Well



PUMP HOUSE LAYOUT
SCALE: 1/2" = 1'

Vertical Service Requirement For Pumps

Horizontal Service Requirement For Filters

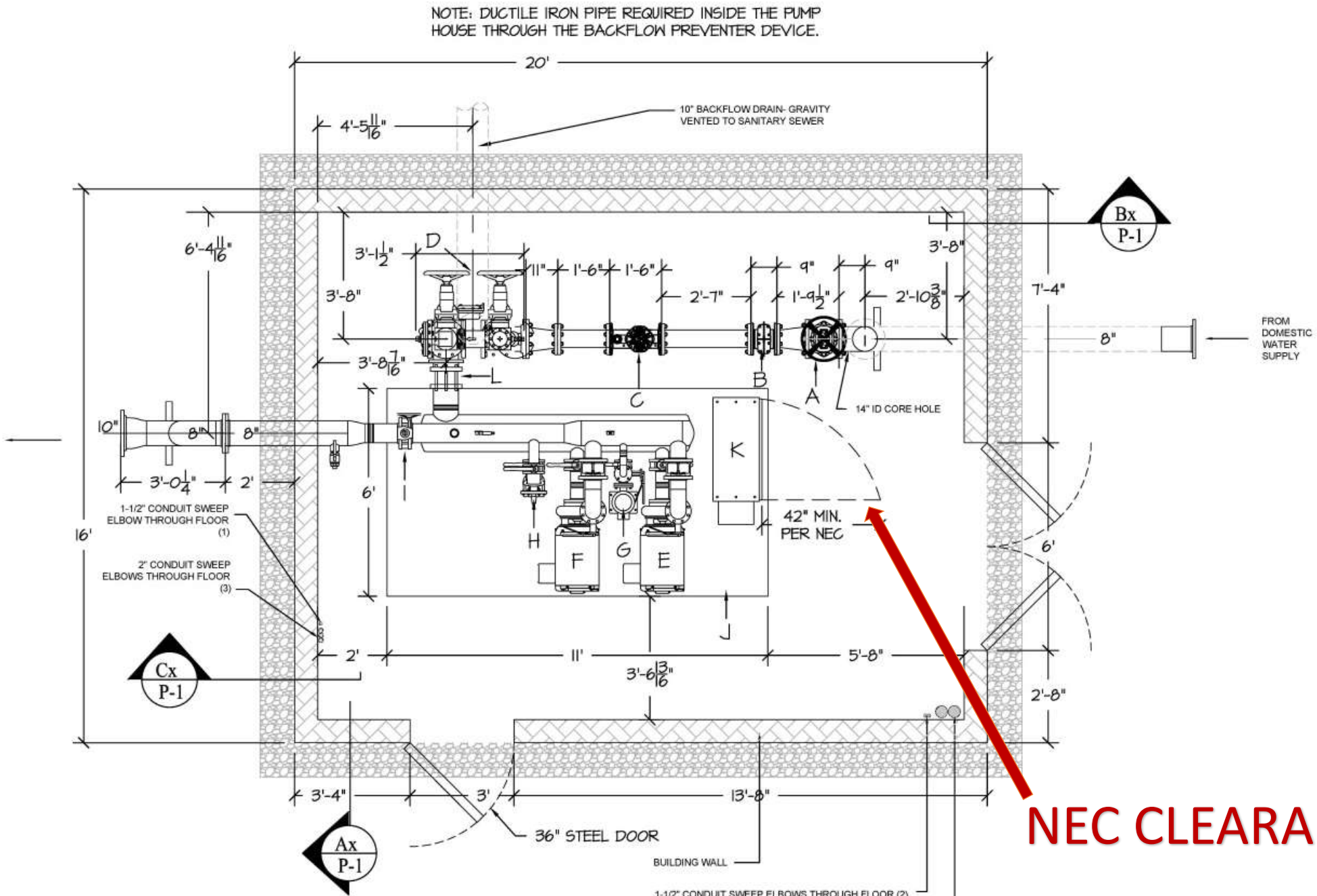


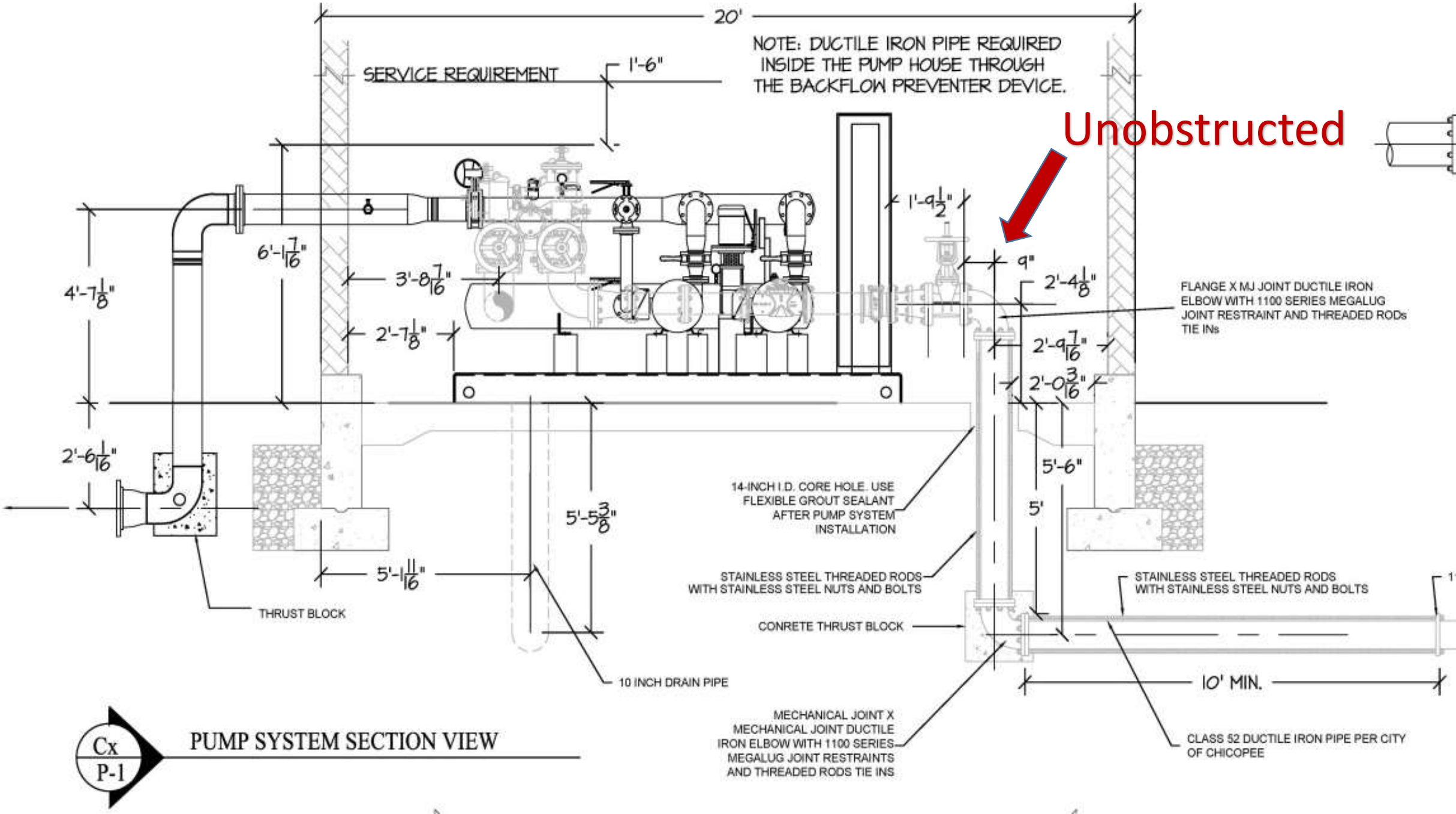
IRRIGATION PUMP HOUSE LAYOUT PLAN
Scale ½" = 1'

Chemical Delivery And Storage Requirement

Pump House

- Code Requirements
  - National Electric Code
    - 42 inches
- Service Clearances
  - 18 to 24 inches minimum back and side
  - Filter Access/Service
  - Overhead Service of Pump and Motors
- Utilities
  - Overhead or Underground
  - Transformer Location


NOTE: DUCTILE IRON PIPE REQUIRED INSIDE THE PUMP HOUSE THROUGH THE BACKFLOW PREVENTER DEVICE.
20'
10" BACKFLOW DRAIN- GRAVITY VENTED TO SANITARY SEWER
4'-5 11/16"
6'-4 11/16"
3'-1 1/2"
D
11"
1'-6"
1'-6"
2'-7"
9"
1'-9 1/2"
9"
2'-10 3/8"
3'-8"
3'-8"
7'-4"
Bx
P-1
FROM DOMESTIC WATER SUPPLY
8"
3'-8 7/16"
L
C
B
A
14" ID CORE HOLE
10"
8"
8"
3'-0 1/4"
2'
6'
K
H
F
G
E
J
42" MIN. PER NEC
16'
1-1/2" CONDUIT SWEEP ELBOW THROUGH FLOOR (1)
2" CONDUIT SWEEP ELBOWS THROUGH FLOOR (3)
Cx
P-1
2'
11'
5'-8"
3'-6 13/16"
6'
2'-8"
3'-4"
3'
13'-8"
Ax
P-1
36" STEEL DOOR
BUILDING WALL
1-1/2" CONDUIT SWEEP ELBOWS THROUGH FLOOR (2)
4" CONDUIT SWEEP ELBOWS THROUGH FLOOR (2)
PUMP SYSTEM PLAN VIEW
NEC CLEARANCE



Cx
P-1

PUMP SYSTEM SECTION VIEW

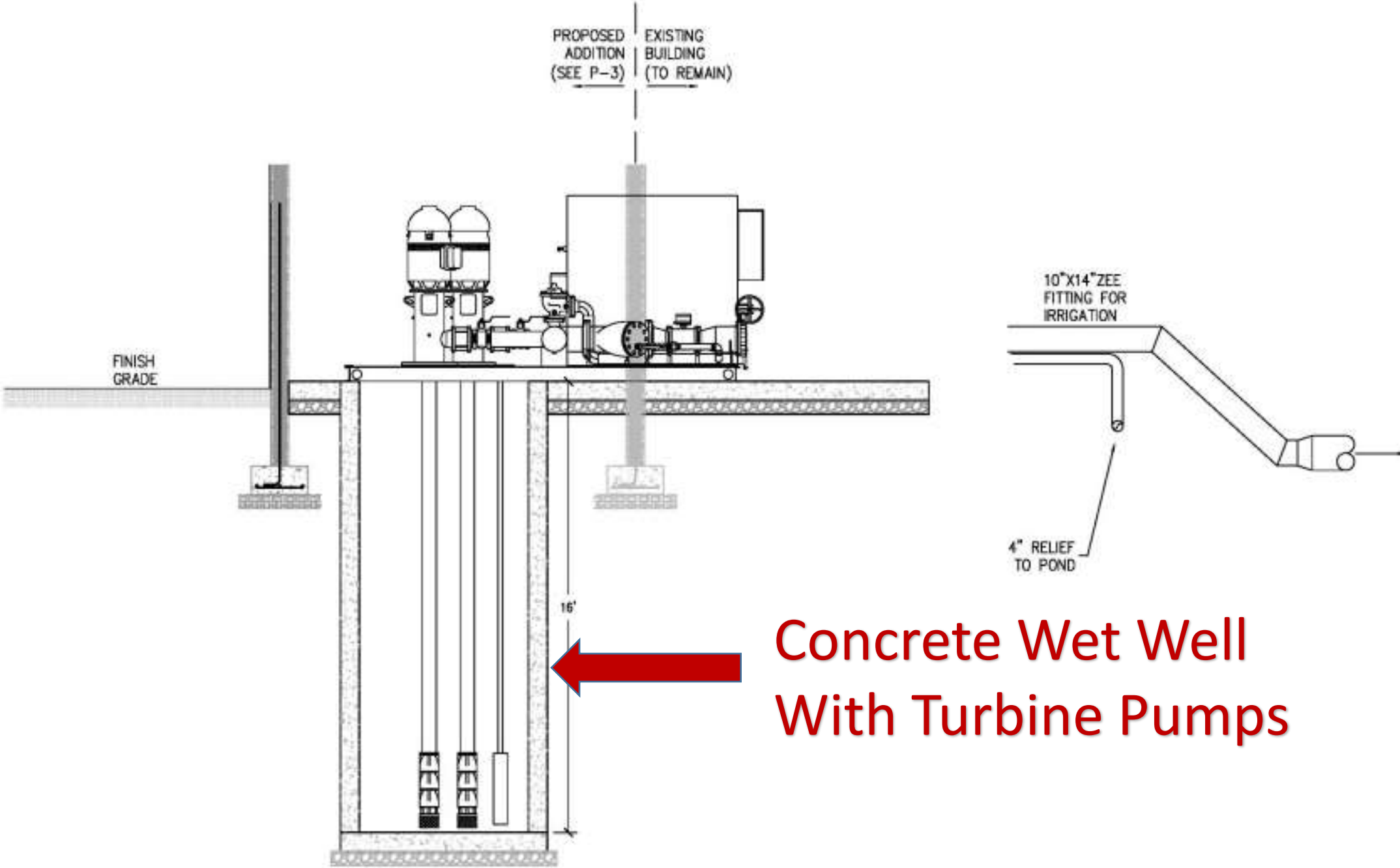

2000 9 28


CONTRONEX


Link-Belt
8690

System Intake

- Intake
  - Suction Lift
  - Wet Well Size and Depth
  - Intake Length
  - Screen Size
  - Is it Existing and Can be Reused?



Concrete Wet Well With Turbine Pumps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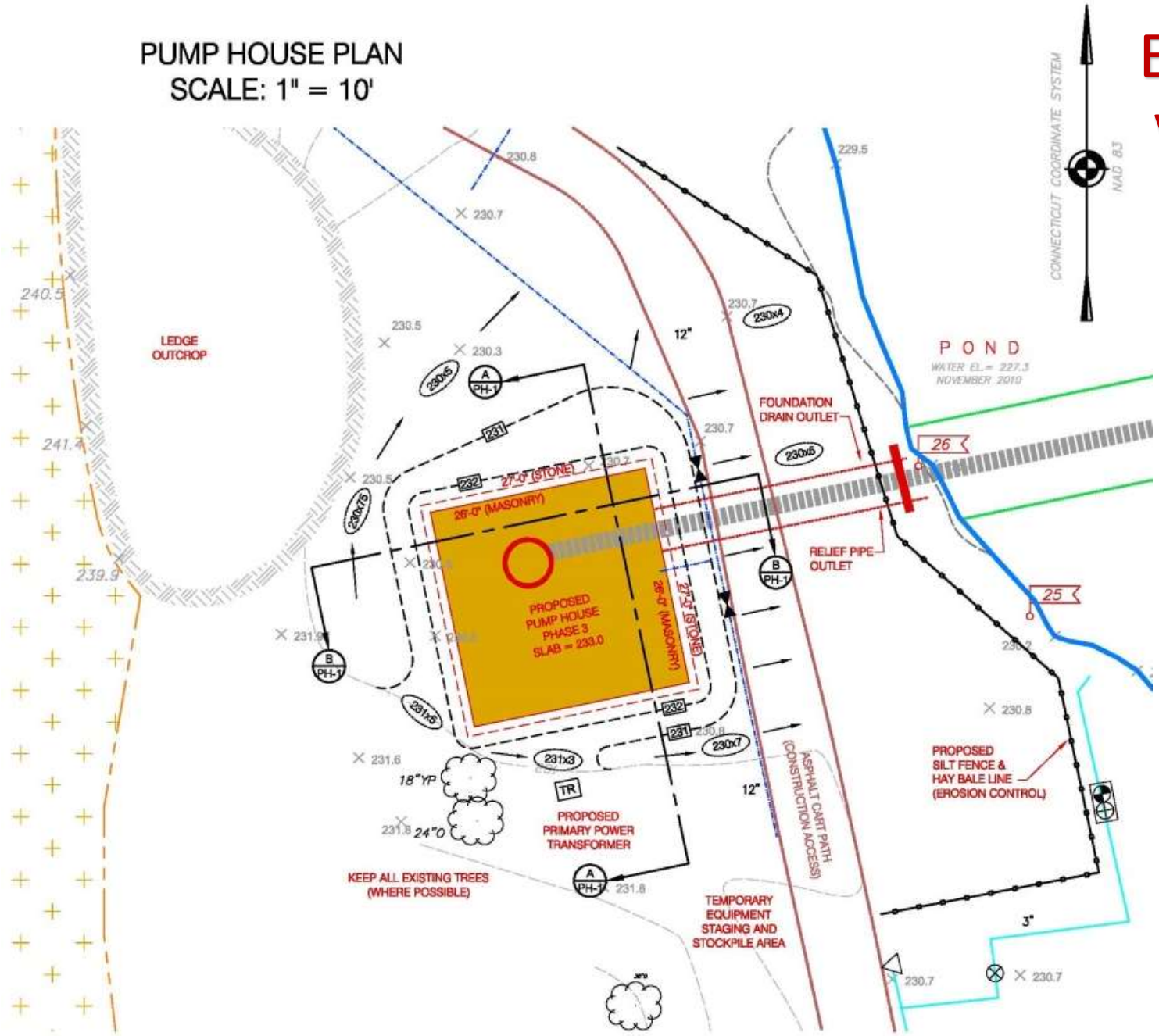
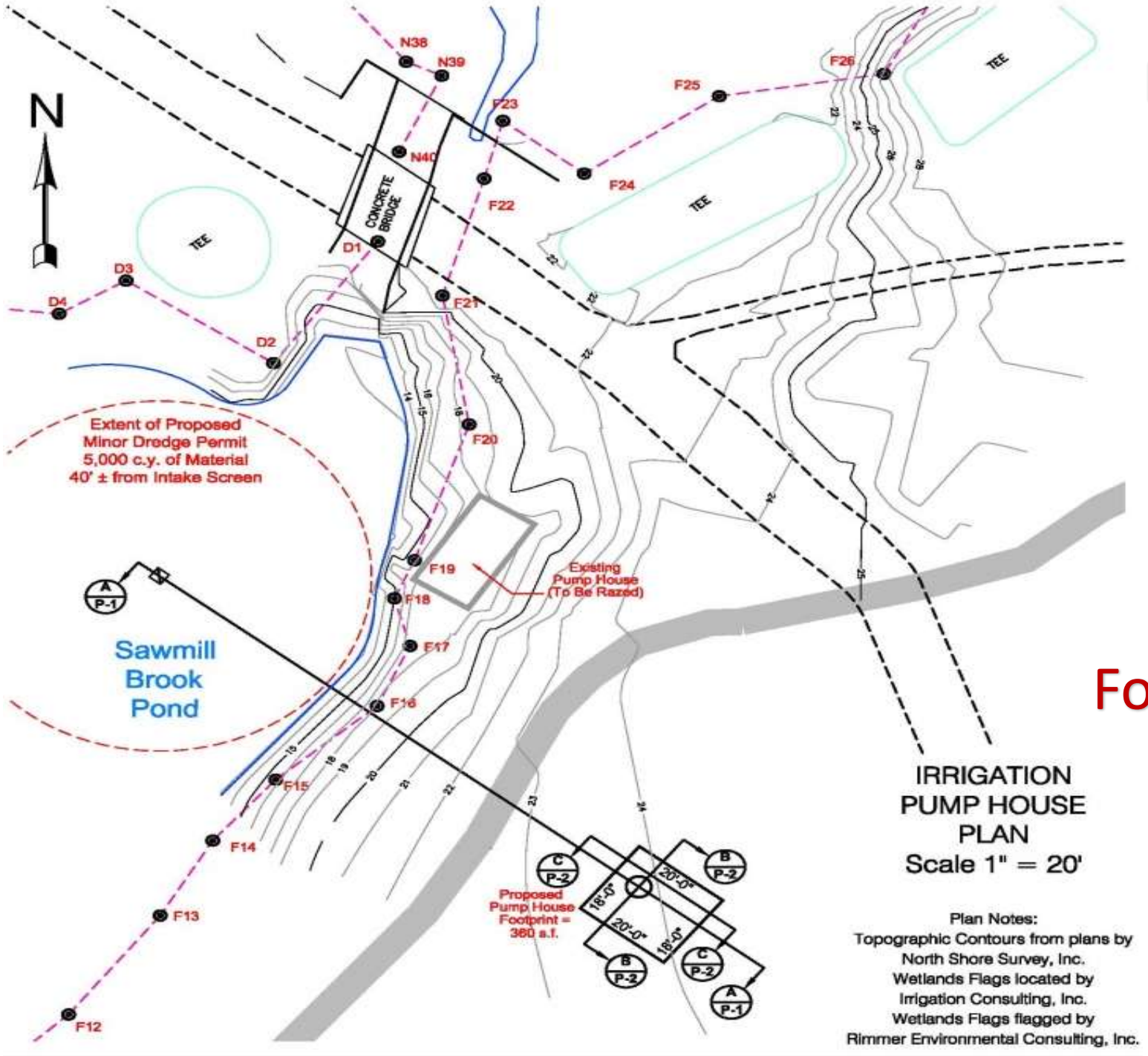
Engineered Site Plans Very Often Required



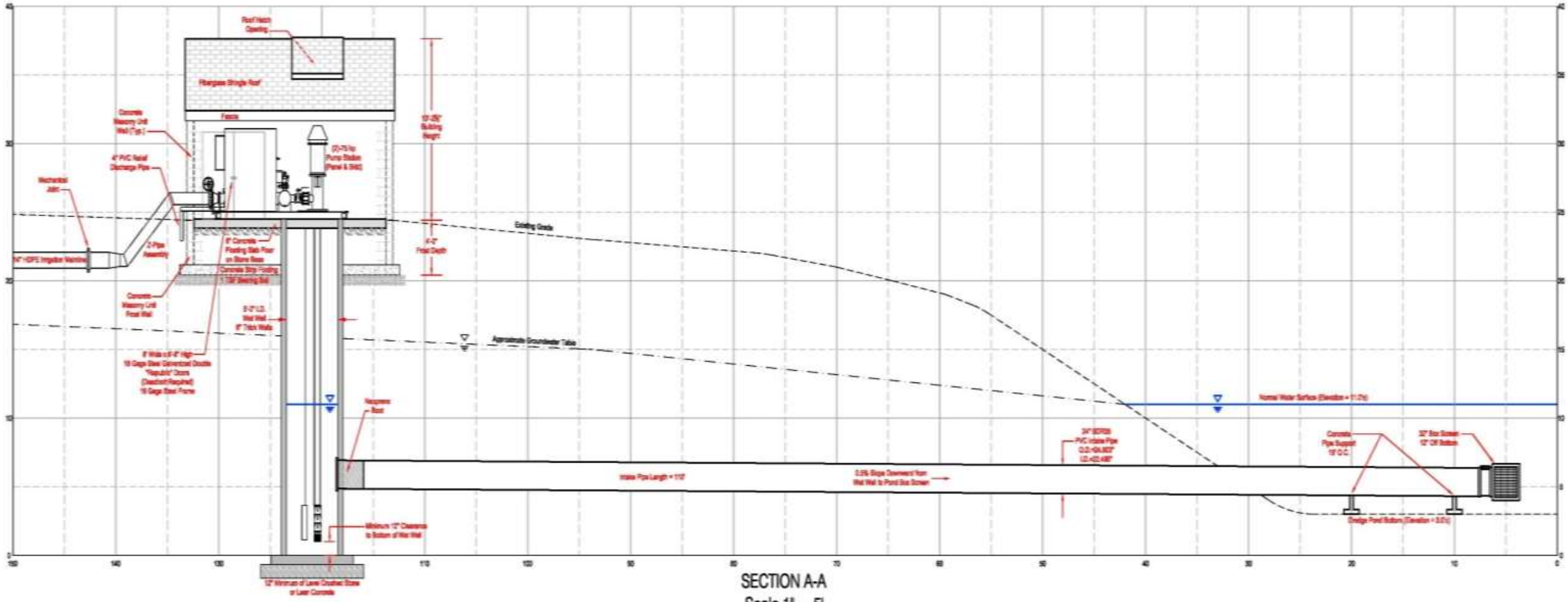


Resource Area/Wet Lands
Require Delineation by
A Science Professional

Topography and Grading
Also Necessary

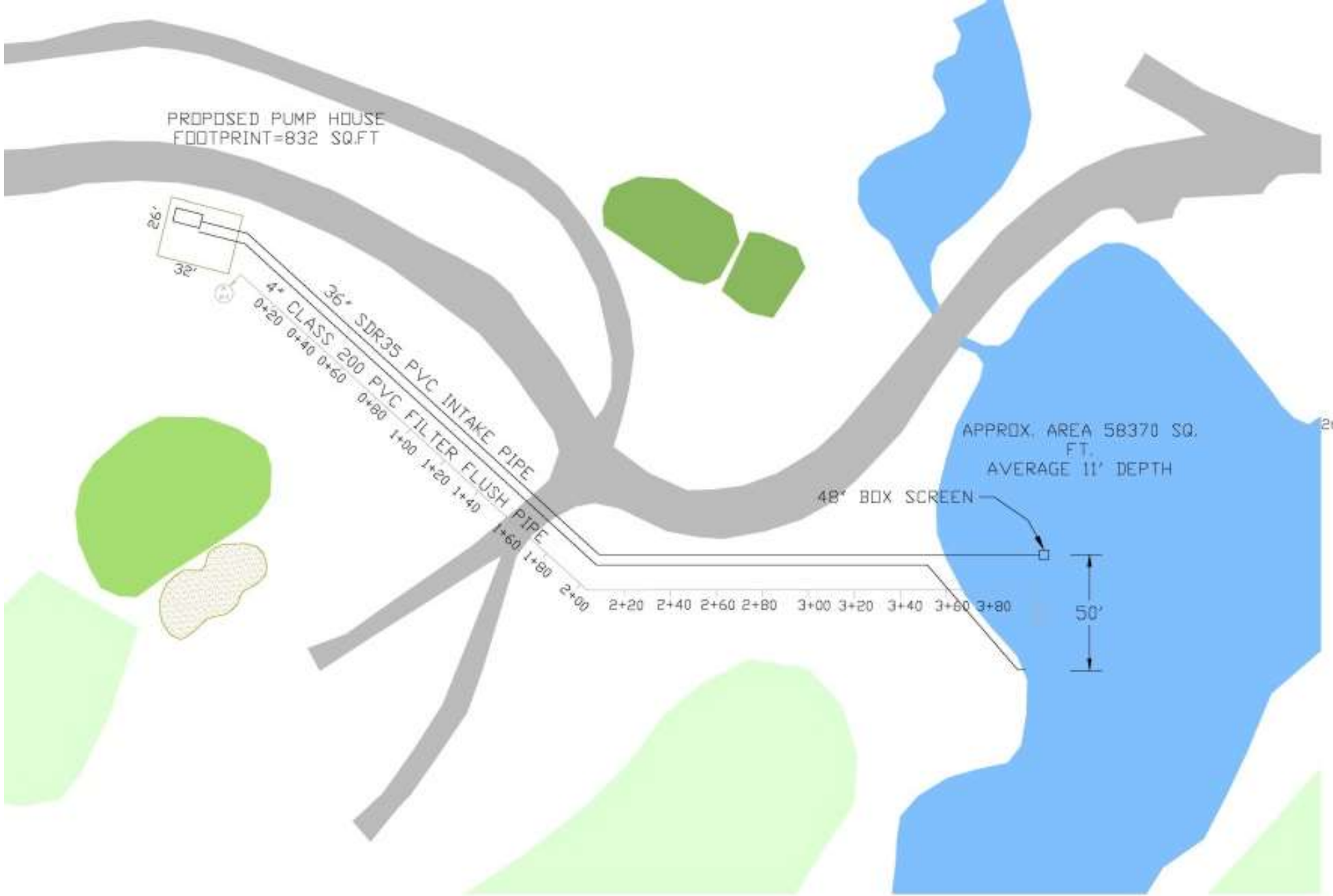
If Filling in a Flood Plain
For Pump House Foundation,
Compensatory Storage
May be Necessary

Typical Engineered Pump System Profile



SECTION A-A
Scale 1" = 5'
NGVD29 Datum per North Shore Survey, Inc.


TOTH BROS.
CAT



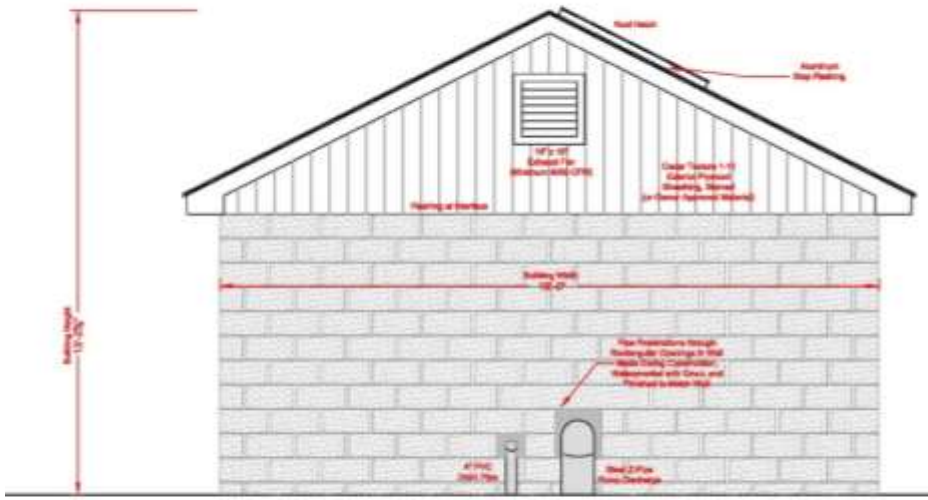
IRRIGATION PUMP HOUSE PLAN
Scale 1" = 30'

Building Materials and Architecture

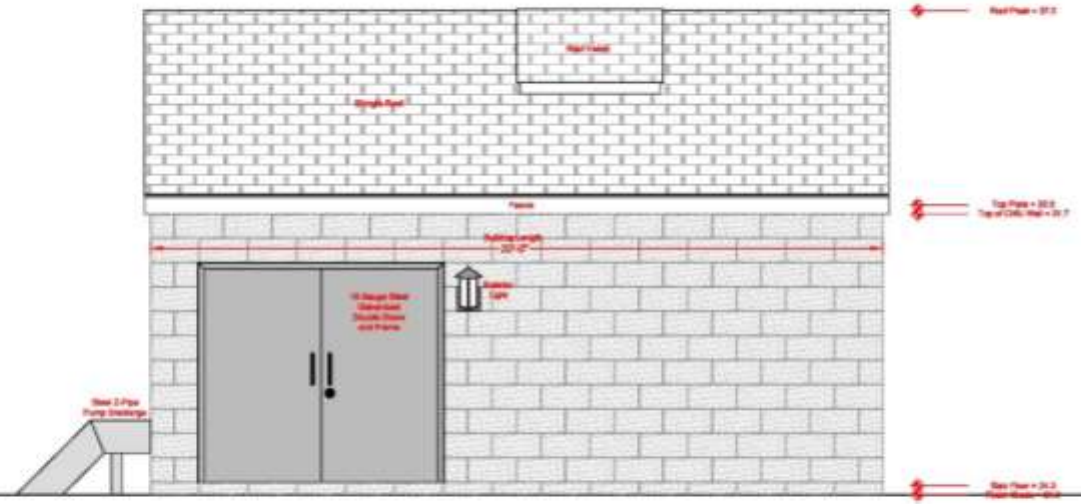
- Material
  - Concrete Block
  - Wood/Timber Frame
  - Steel
  - Composite
  - Various Finishes
- Utility/Non-Aesthetic
- In Character with Clubhouse or Local Building Codes


XTREME
MANUFACTURING

North Elevation
Scale ½" = 1'



East Elevation
Scale ½" = 1'



West Elevation
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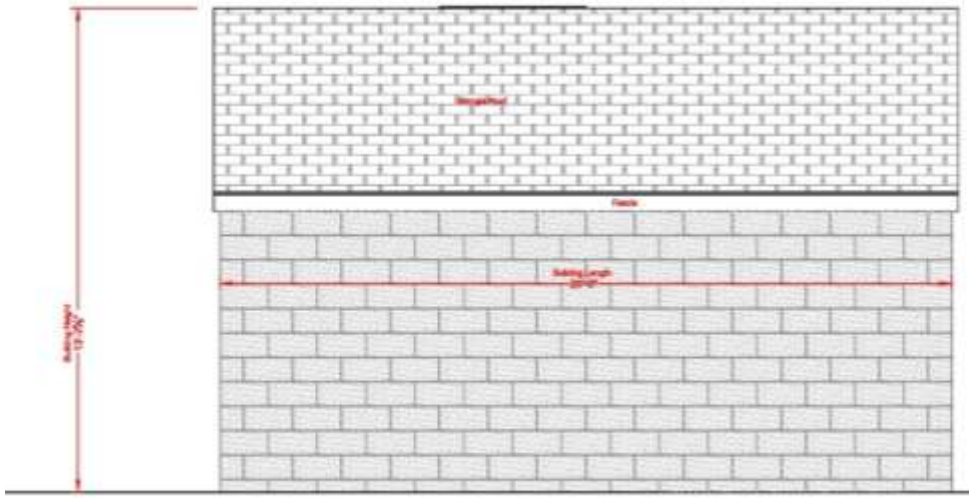
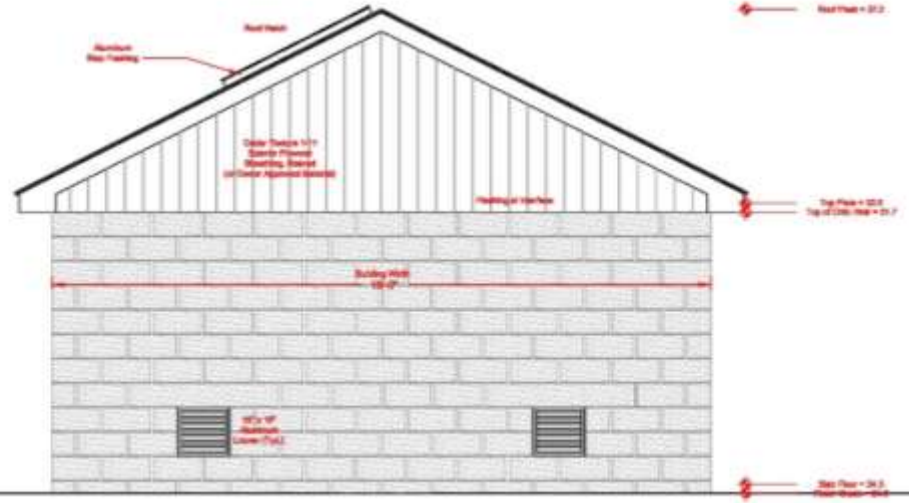
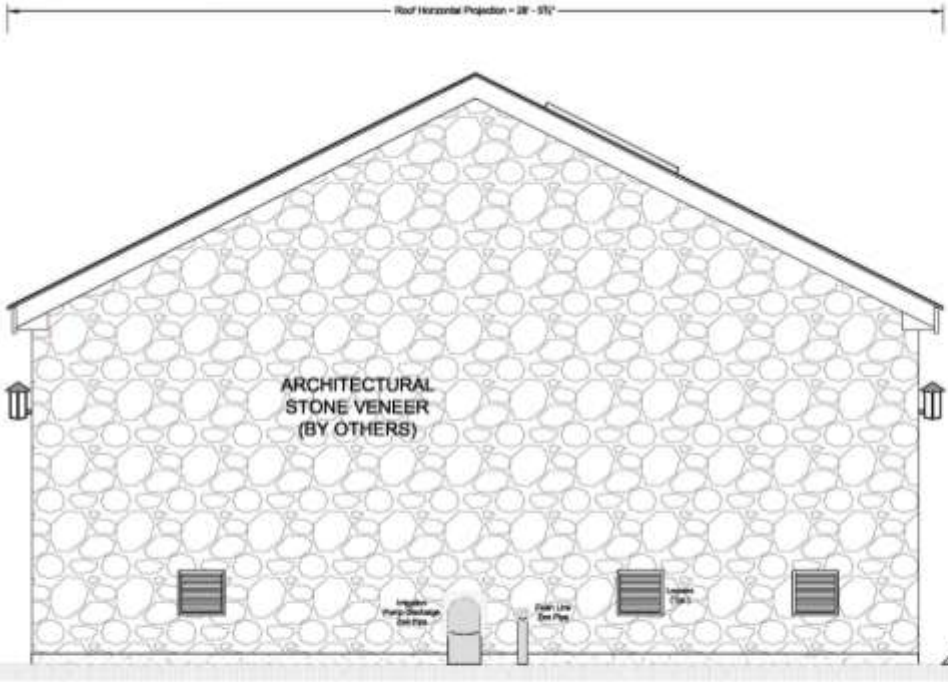


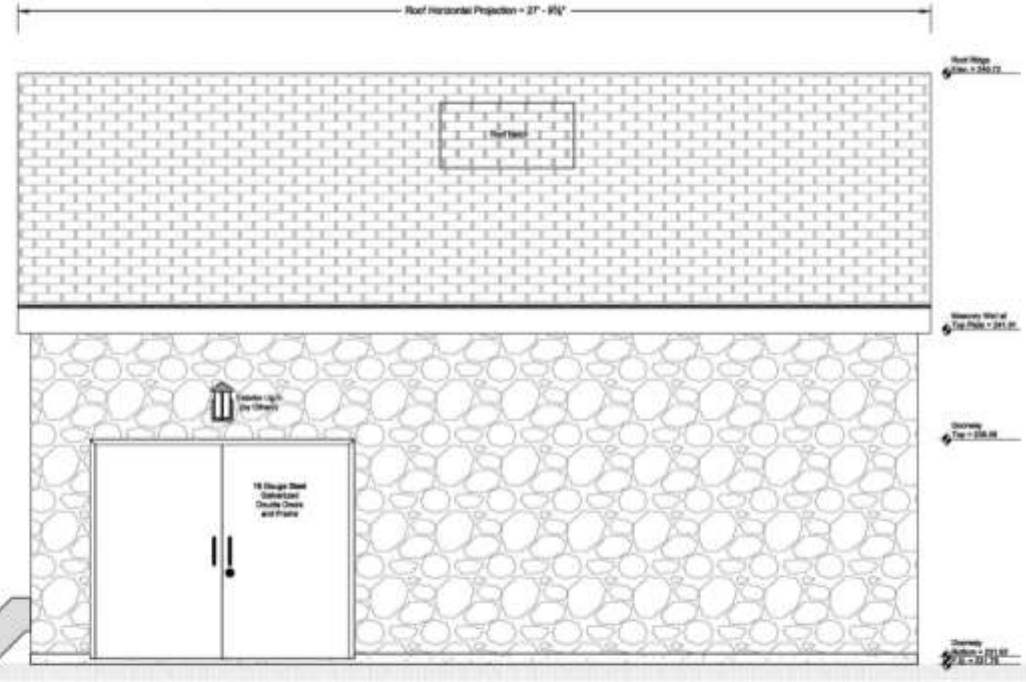
South Elevation
Scale ½" = 1'



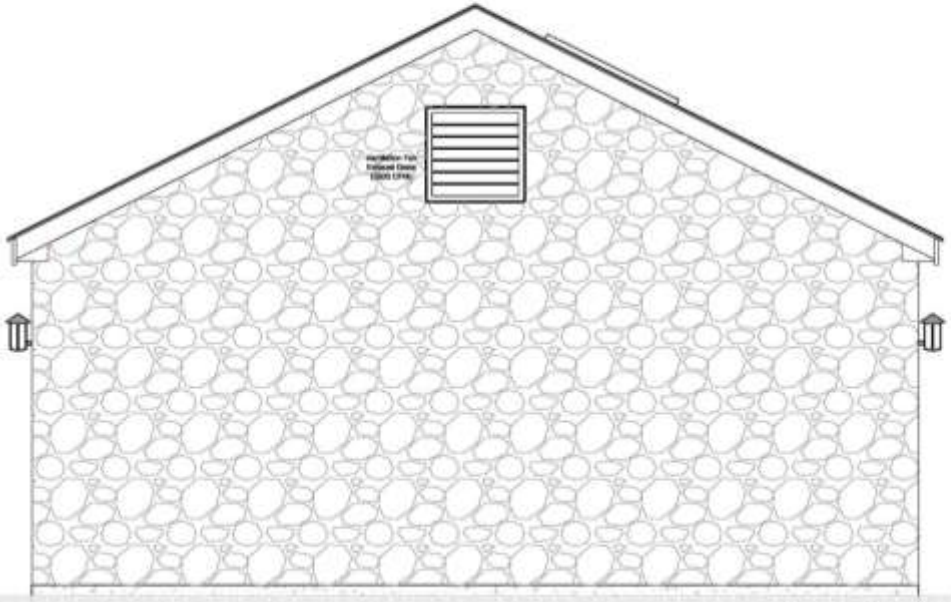
EAST ELEVATION



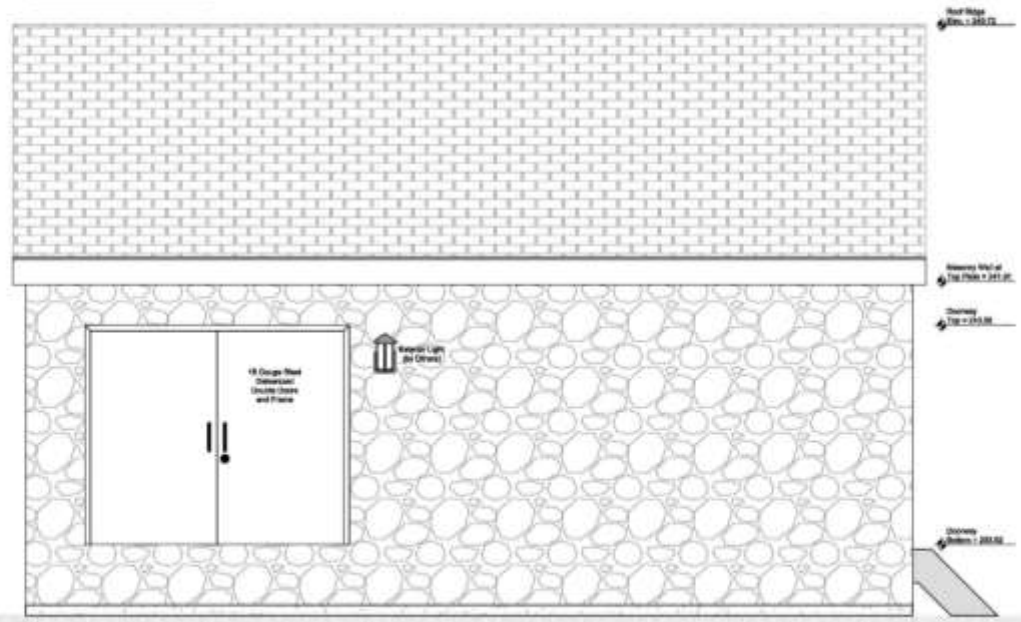
NORTH ELEVATION

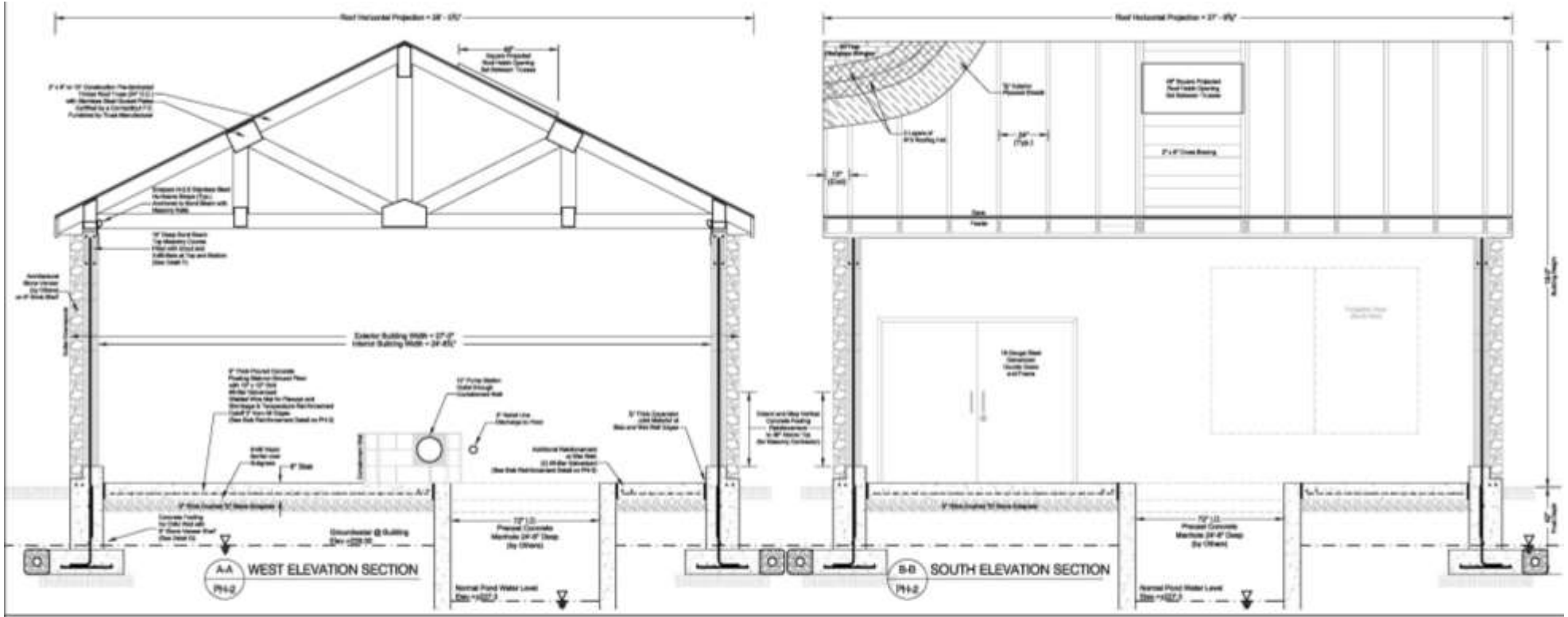


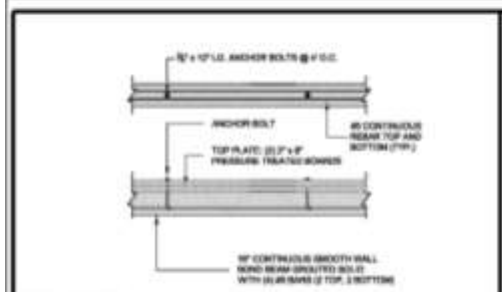
WEST ELEVATION



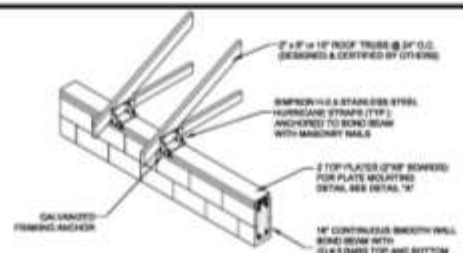
SOUTH ELEVATION



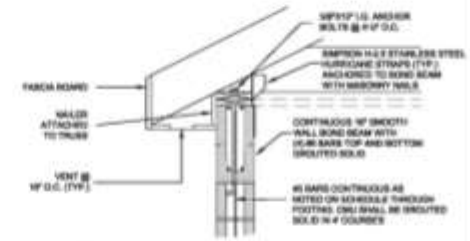




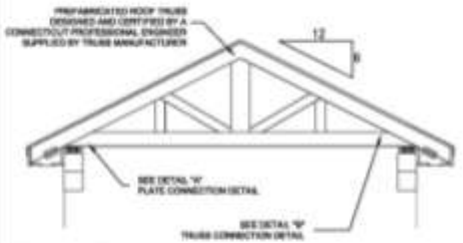
DETAIL A - N.T.S.
PLATE CONNECTION DETAIL



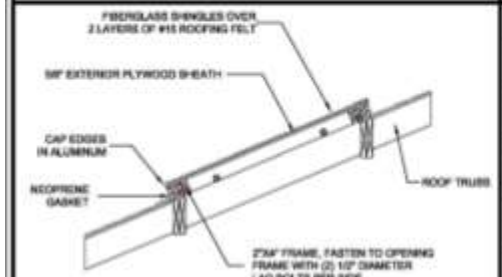
DETAIL B - N.T.S.
TRUSS CONNECTION DETAIL



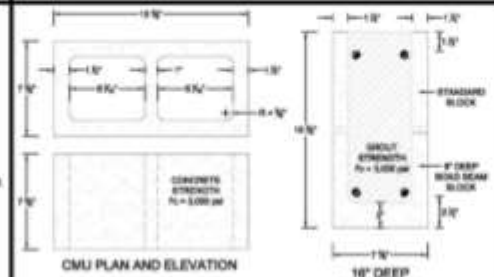
DETAIL C - N.T.S.
TOP PLATE DETAIL



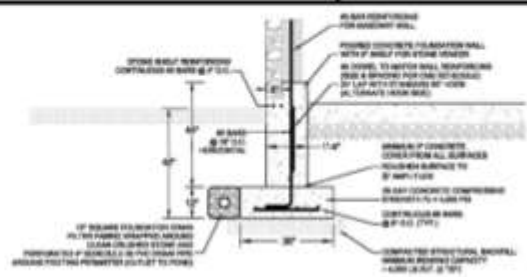
DETAIL D - N.T.S.
TRUSS DETAIL



DETAIL E - N.T.S.
ROOF HATCH



DETAIL F - N.T.S.
CMU BLOCK & LINTEL DETAIL



DETAIL G - N.T.S.
CONCRETE FOOTING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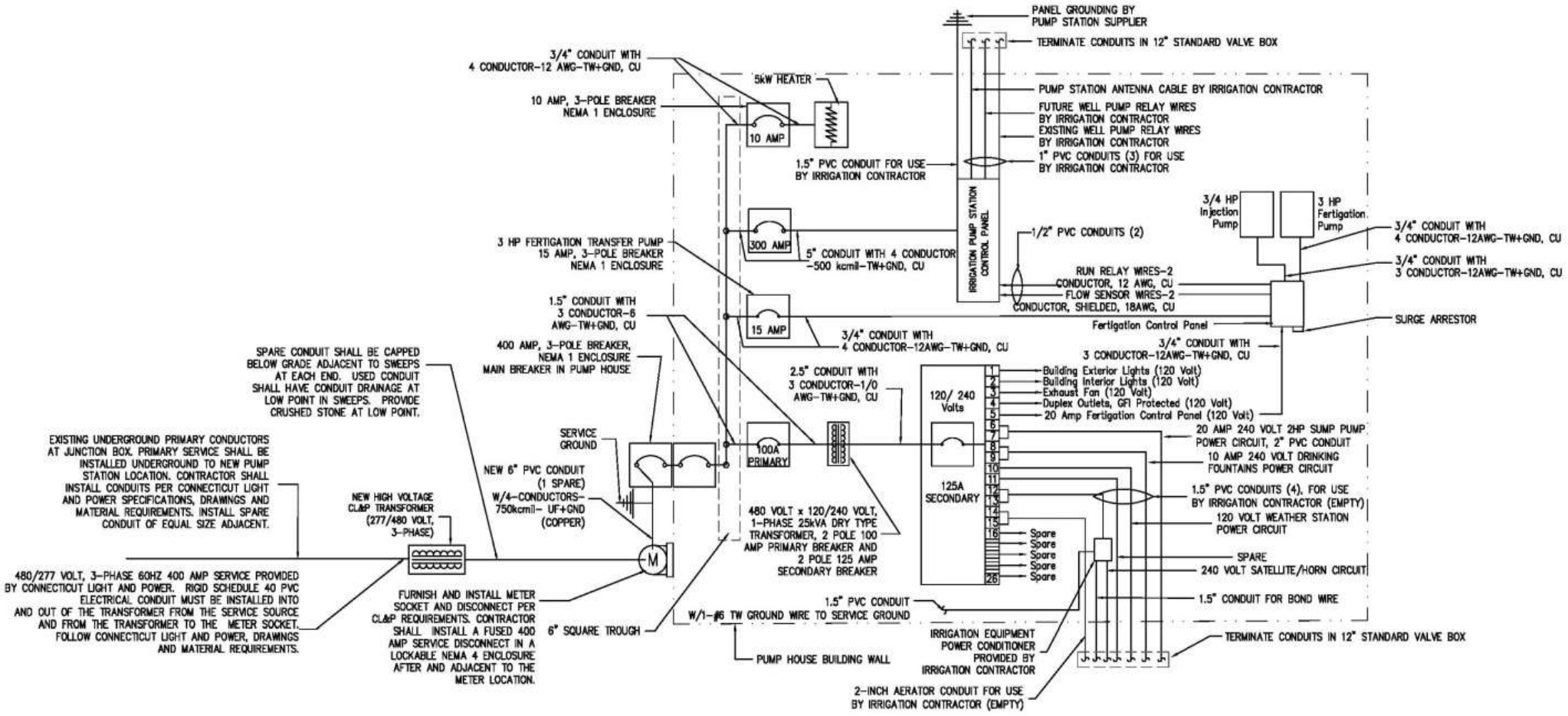
Electrical

Overall Current Load/Planned Equipment

- Main Pump Station Horsepower
  - 1 HP = 0.745kW
  - Watts = Amps x Voltage
  - Greater Voltage = Lower Current for the same power output
  - Full Load Current of Motors are Provided
- Water Treatment Equipment
- Field Equipment
  - Irrigation Controllers
  - Fountains
  - Aerators
- Building HVAC
- Miscellaneous

One-Line Diagram

Identify and Size All Primary and Branch Circuits



ONE LINE DIAGRAM
Not to Scale

NOTE:

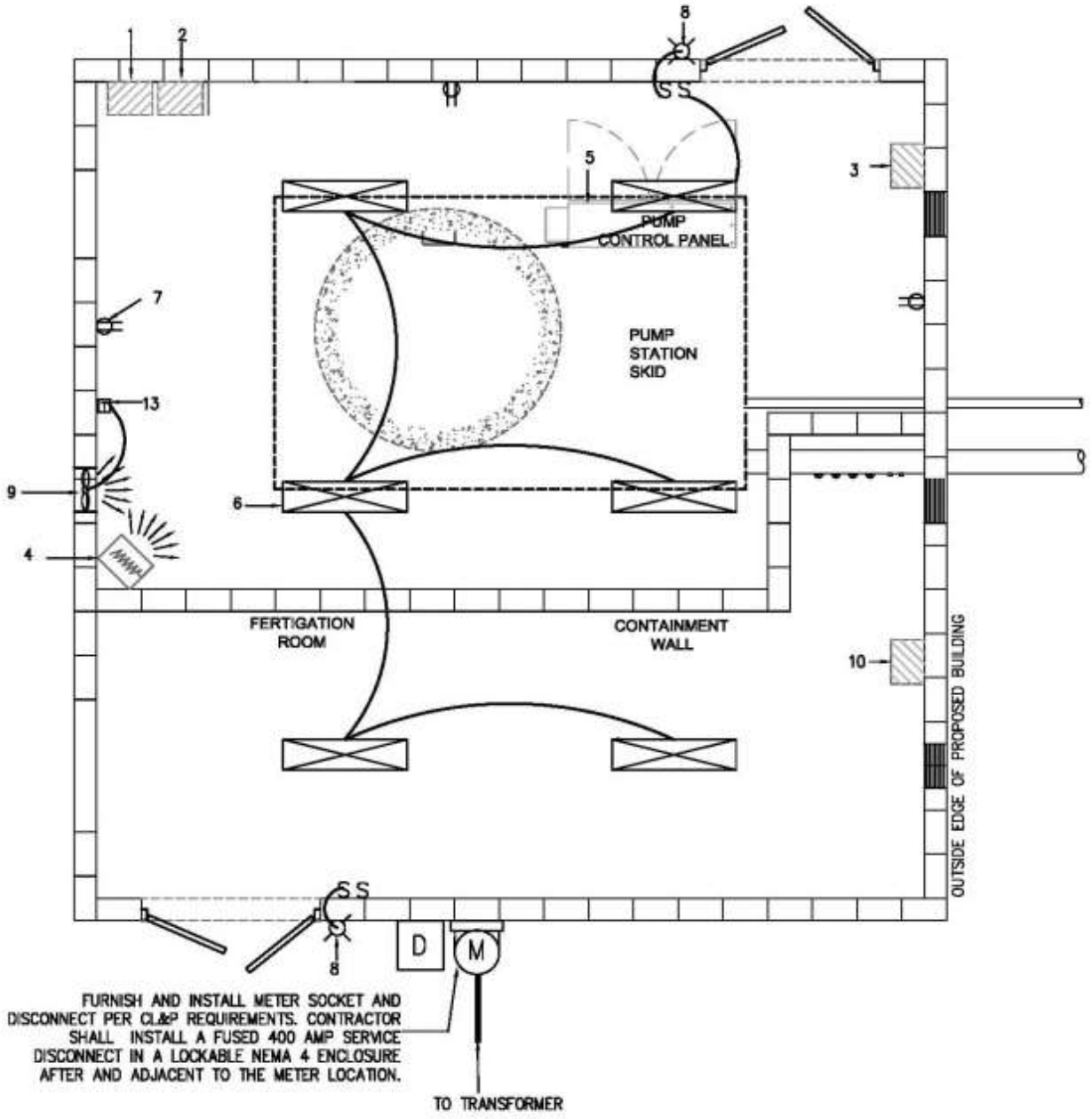
ALL OUTDOOR, ABOVE GRADE WIRE SHALL BE IN CONDUIT.

UNLESS OTHERWISE NOTED, ALL SINGLE PHASE CIRCUITS SHALL CONSIST OF 3/4" PVC CONDUIT 3 CONDUCTOR-#12 TW+GND, CU PROTECTED BY A 15 AMP BREAKER IN THE LIGHTING PANEL.

ALL CONDUITS WITHIN PUMP HOUSE SHALL BE INSTALLED OVERHEAD

ALL WIRING SHALL BE DONE WITH COPPER CONDUCTORS.

Lighting and Receptacle Plan



LEGEND:

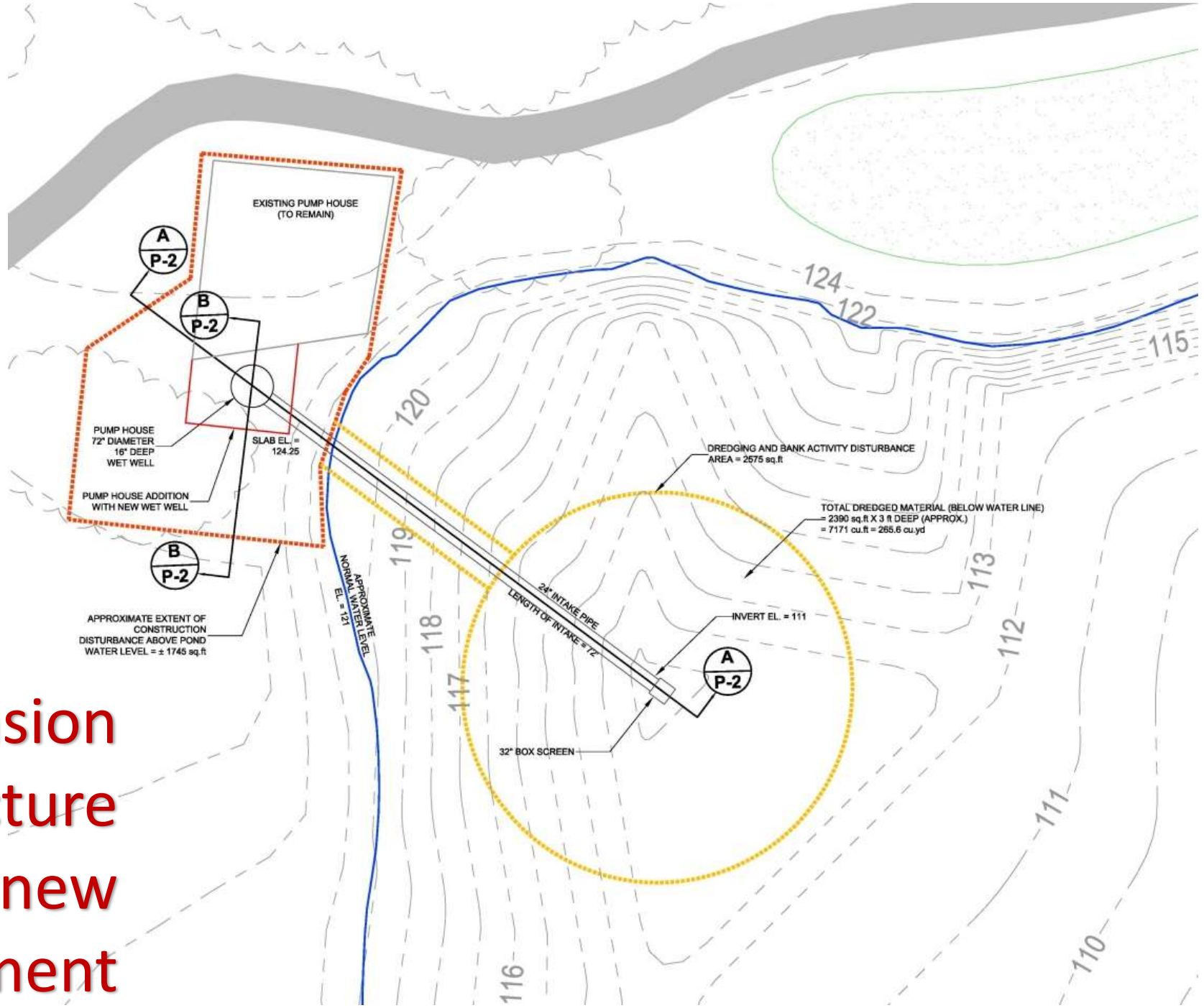
1. 3–Phase Control Panel: Main Breaker Fertigation Transfer Pump, Heater Equipment and Pump Control Panel and Lighting Panel Breakers
2. Lighting Panel 480V TO 120/240V Transformer in Nema 4 Enclosure
3. Irrigation Power Conditioner Box (By Others)
4. 5000 Watt Resistive Heater
5. Main Pump Control Panel (By Others)
6. 2'x4' Surface Mounted Ceiling Light (Typ. 6)
7. Duplex Outlet (Typ.)
8. Wall Pack Light
9. Wall Mounted Exhaust Fan 1650 CFM W/ Louver and Thermostat Switch
10. Fertigation Control Panel.

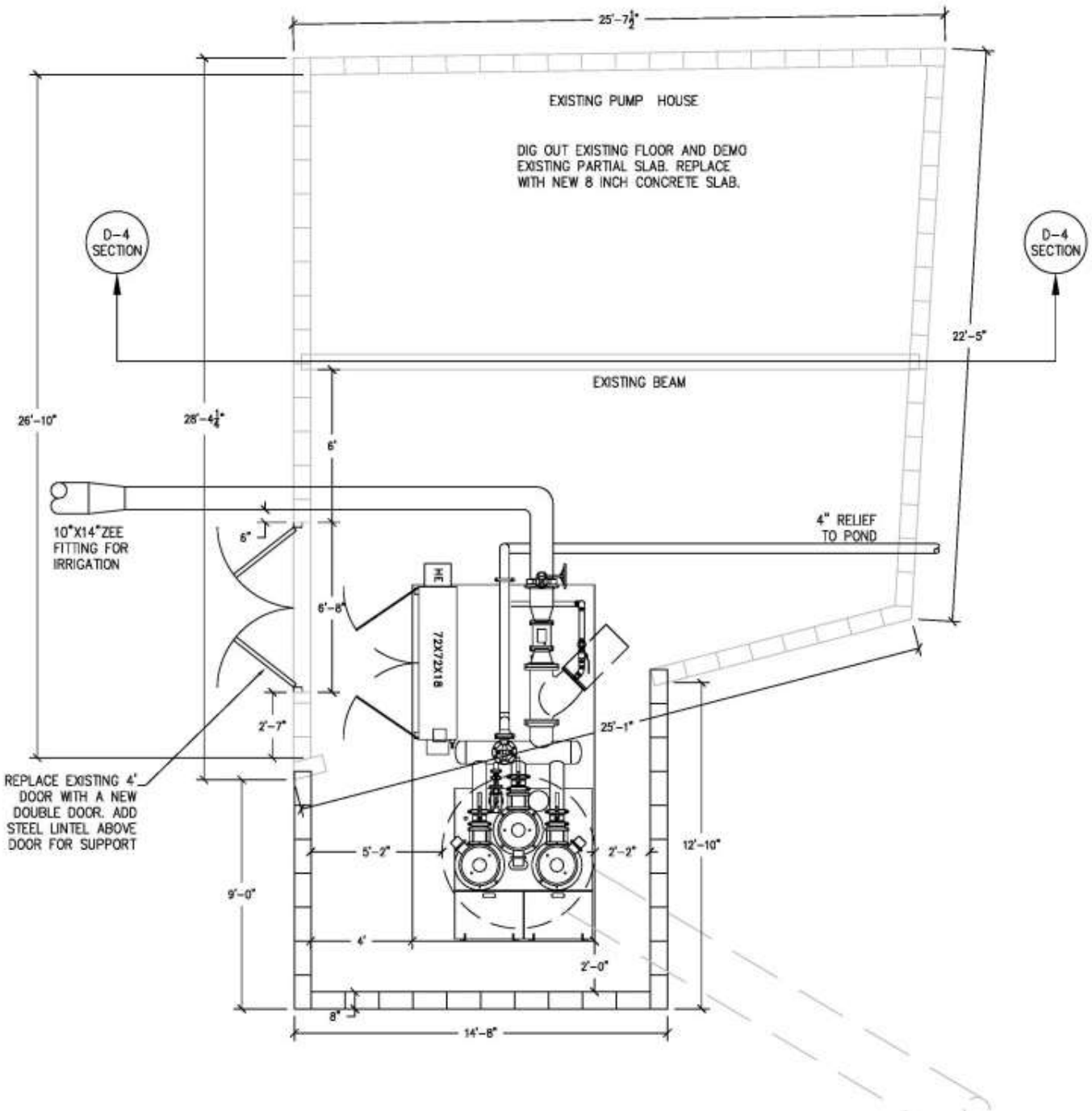
Other Equipment

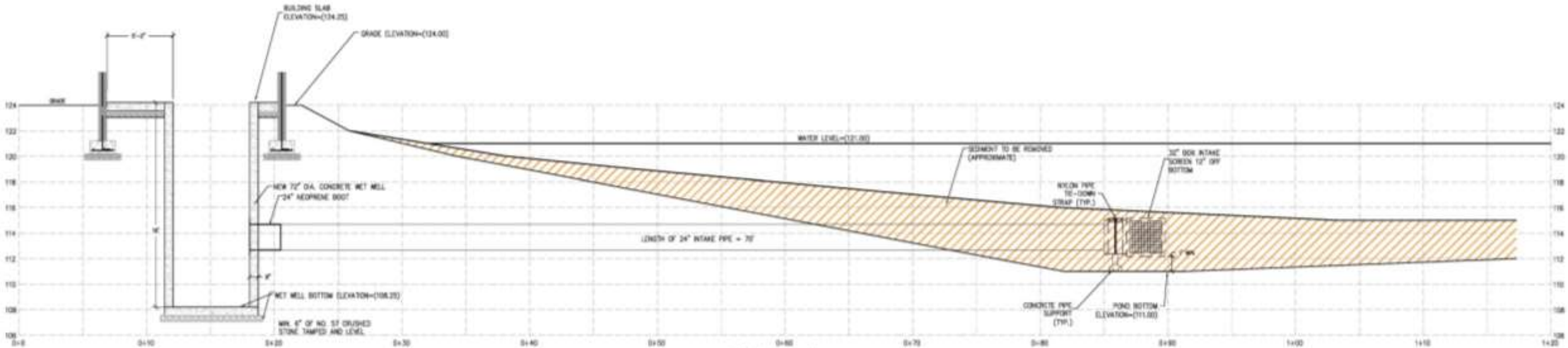
- Filters
  - Sized for peak flow. Single or multiple filters. Quantity does not have to match number of main pumps. Size based on:
    - Flow
    - Screening (microns)
    - Level of cleaning needed
- Disinfection – requires significant filtration
  - Ultra-violet
  - Ozone
  - Chlorine
- Reverse Osmosis (RO)
- Fertigation
  - On Skid
  - Off Skid
- Backflow Prevention


amiad
amiad
CAUTION

Improvements/Expansion Of Existing Structure To Accommodate new Equipment




25'-7½"
EXISTING PUMP HOUSE
DIG OUT EXISTING FLOOR AND DEMO EXISTING PARTIAL SLAB. REPLACE WITH NEW 8 INCH CONCRETE SLAB.
D-4 SECTION
D-4 SECTION
22'-5"
EXISTING BEAM
26'-10"
28'-4¼"
6'
10"X14" ZEE FITTING FOR IRRIGATION
6"
4" RELIEF TO POND
HE
72X72X18
6'-8"
2'-7"
25'-1"
REPLACE EXISTING 4' DOOR WITH A NEW DOUBLE DOOR. ADD STEEL LINTEL ABOVE DOOR FOR SUPPORT
5'-2"
2'-2"
12'-10"
9'-0"
4'
2'-0"
8"
14'-8"


BUILDING SLAB
ELEVATION=(134.25)
GRADE ELEVATION=(134.00)
GRADE
NEW 72" DIA. CONCRETE WET WELL
24" NEOPRENE BOOT
WATER LEVEL=(121.00)
SEDIMENT TO BE REMOVED
(APPROXIMATE)
32" DIA INTAKE
SCREEN 12" OFF
BOTTOM
NYLON PIPE
TIE-DOWN
STRAP (TYP.)
LENGTH OF 24" INTAKE PIPE = 70'
WET WELL BOTTOM ELEVATION=(108.25)
MIN. 6" OF NO. 57 CRUSHED
STONE TAMPED AND LEVEL
CONCRETE PIPE
SUPPORT
(TYP.)
POND BOTTOM
ELEVATION=(111.00)
124
122
120
118
116
114
112
110
108
106
0+00
0+10
0+20
0+30
0+40
0+50
0+60
0+70
0+80
0+90
1+00
1+10
1+20

SECTION A-A

Evolution in Pump Station Technology

- Cla-Val Pressure Regulation
- Motorized Butterfly Valves Pressure Regulation
- Relay Logic

Data Industrial 220 SS

Web Enabled Touch Screen

Air Condition Cooled Panel

Premium Efficient Motors

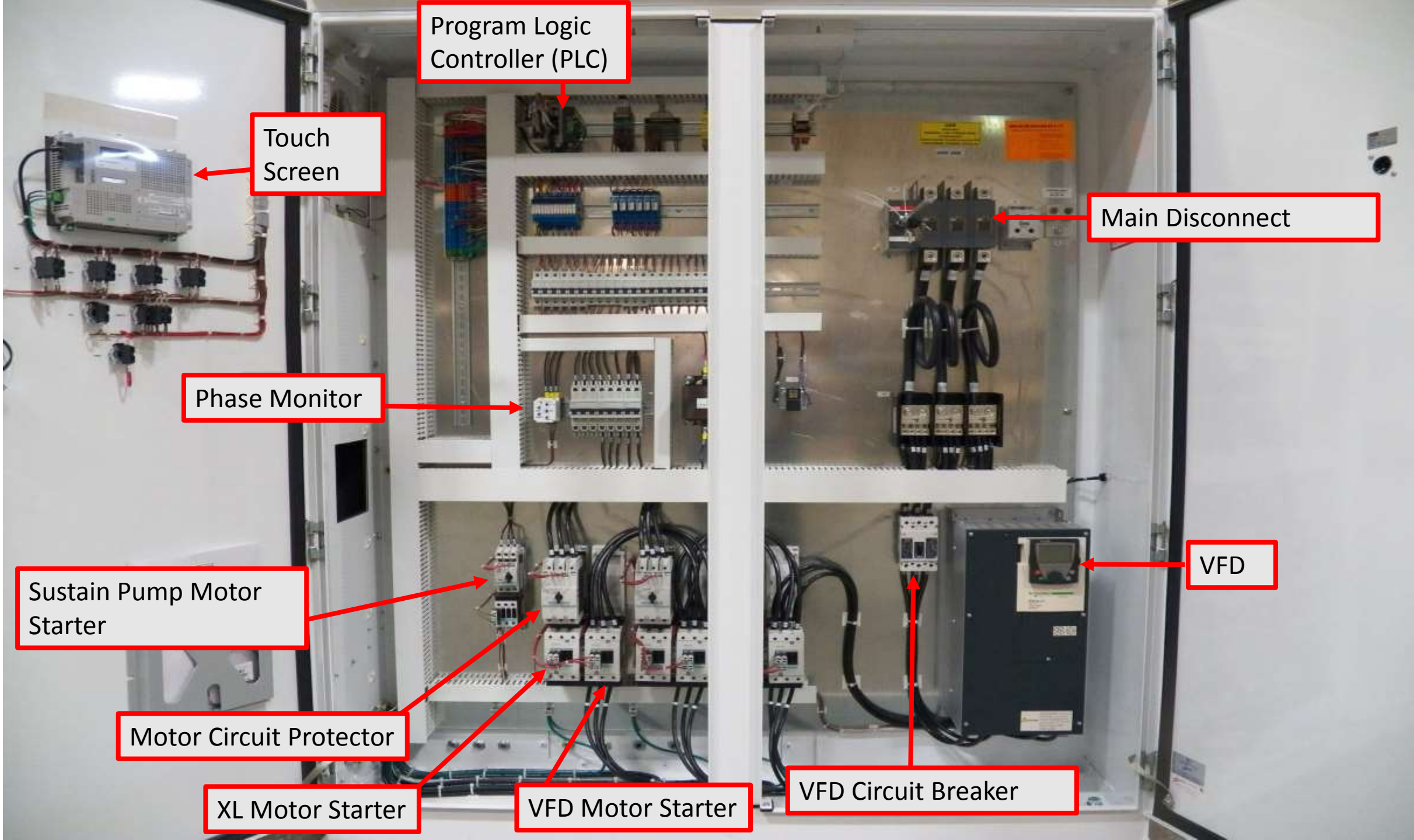
Electromagnetic Flow Meter

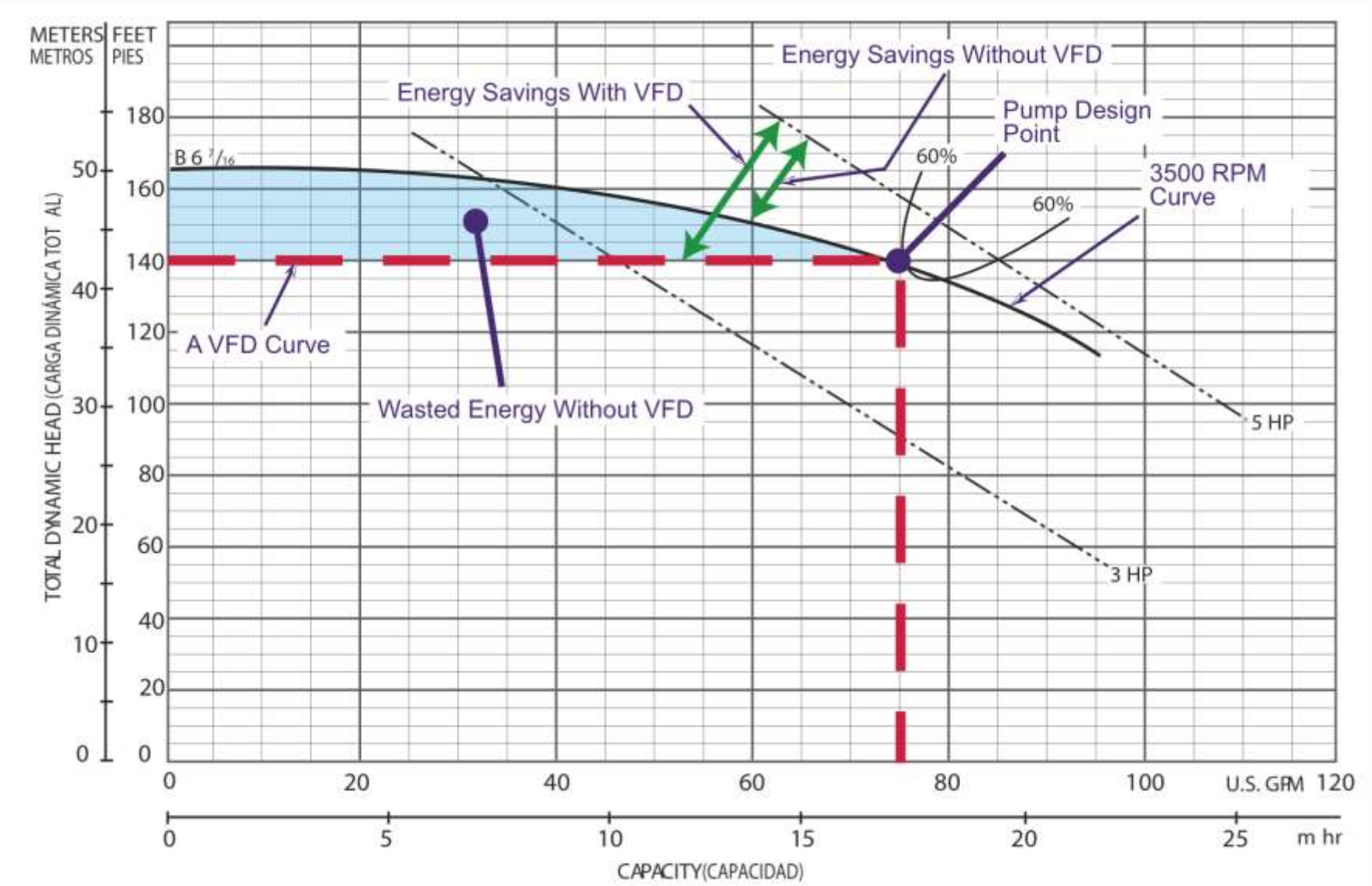
Mechanical Seals

Corrosion Protection

- Aluminum
- Stainless Steel
- Poly Urea (bed liner)

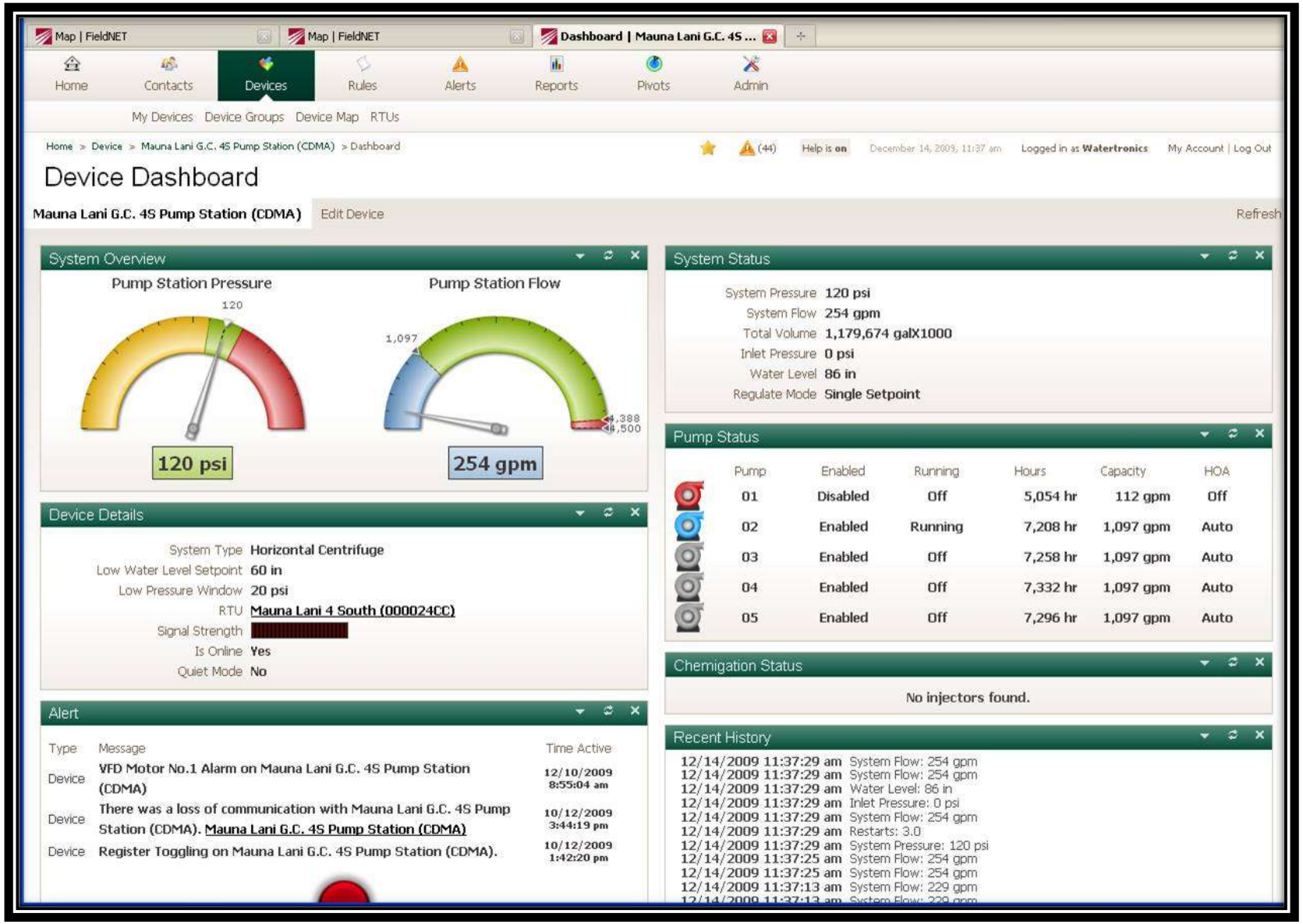
Stainless Steel Pump Impellers


Program Logic Controller (PLC)
Touch Screen
Main Disconnect
Phase Monitor
VFD
Sustain Pump Motor Starter
Motor Circuit Protector
XL Motor Starter
VFD Motor Starter
VFD Circuit Breaker



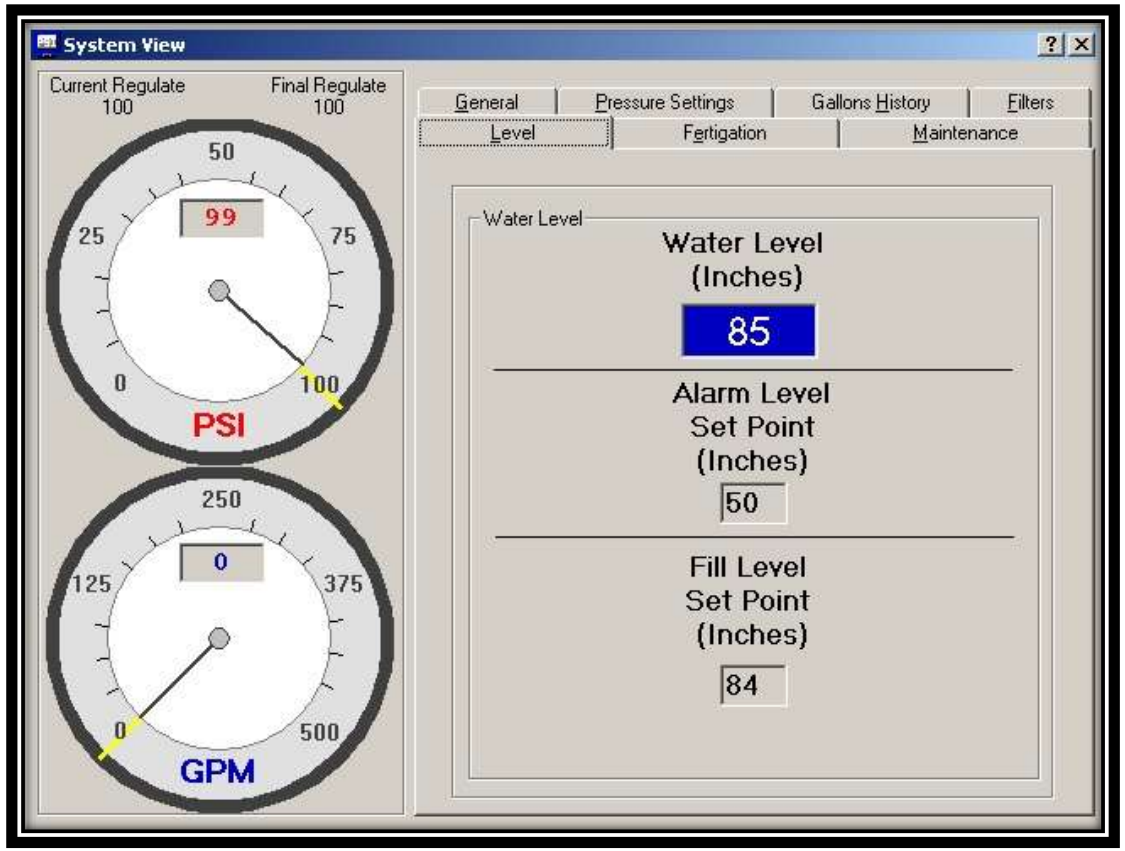
The horizontal dashed red line represents a VFD regulating a constant pressure at variable flow.

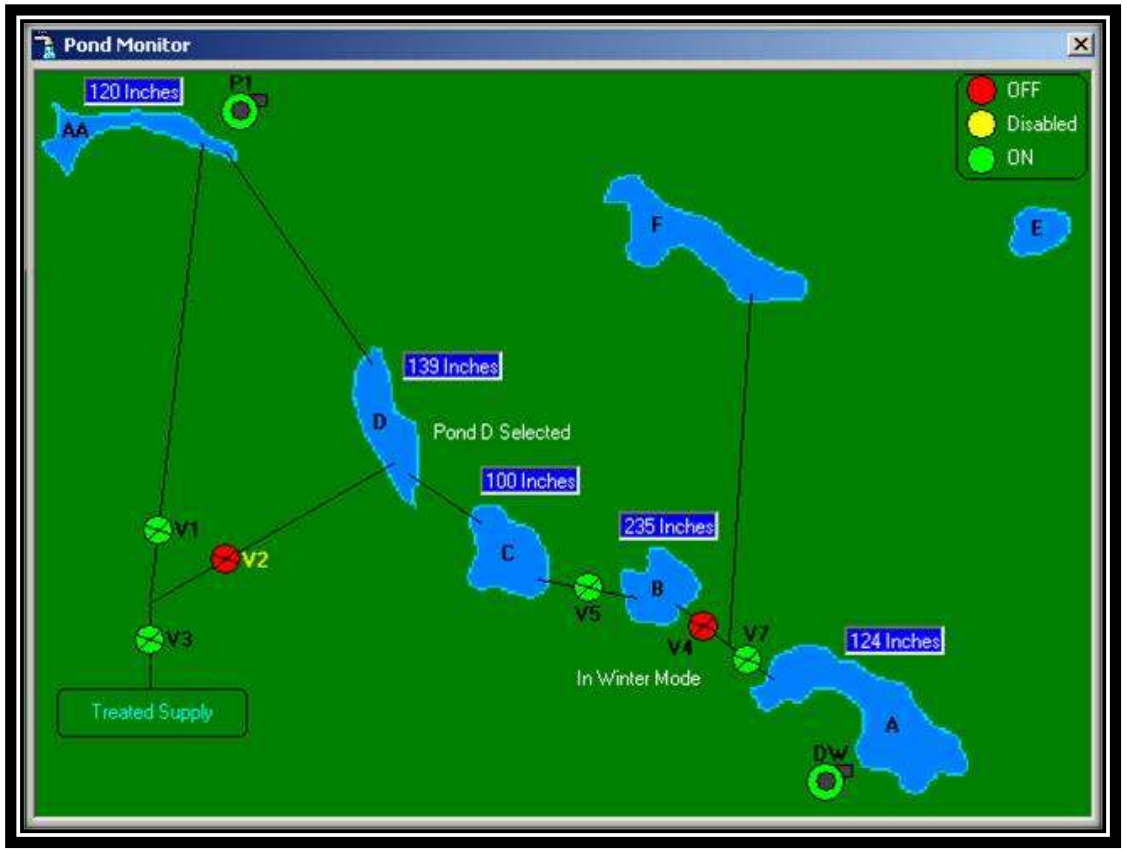
ADVANCE CONTROL FEATURES



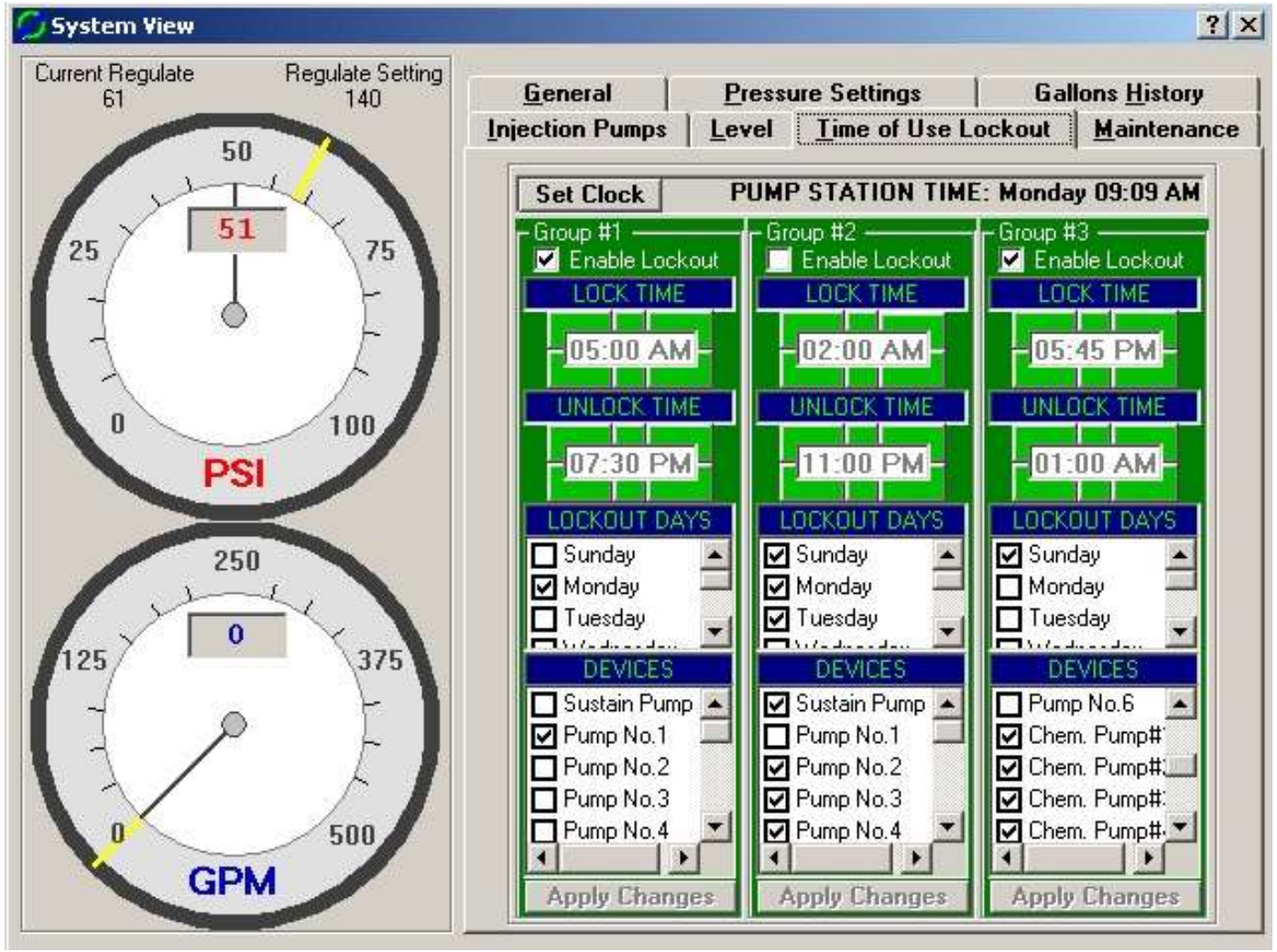
ADVANCE CONTROL FEATURES

ADVANCE CONTROL FEATURES





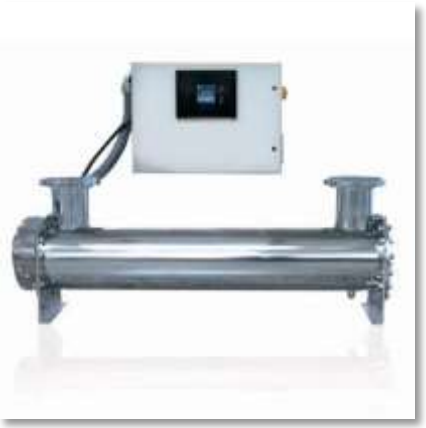
Lockout Control



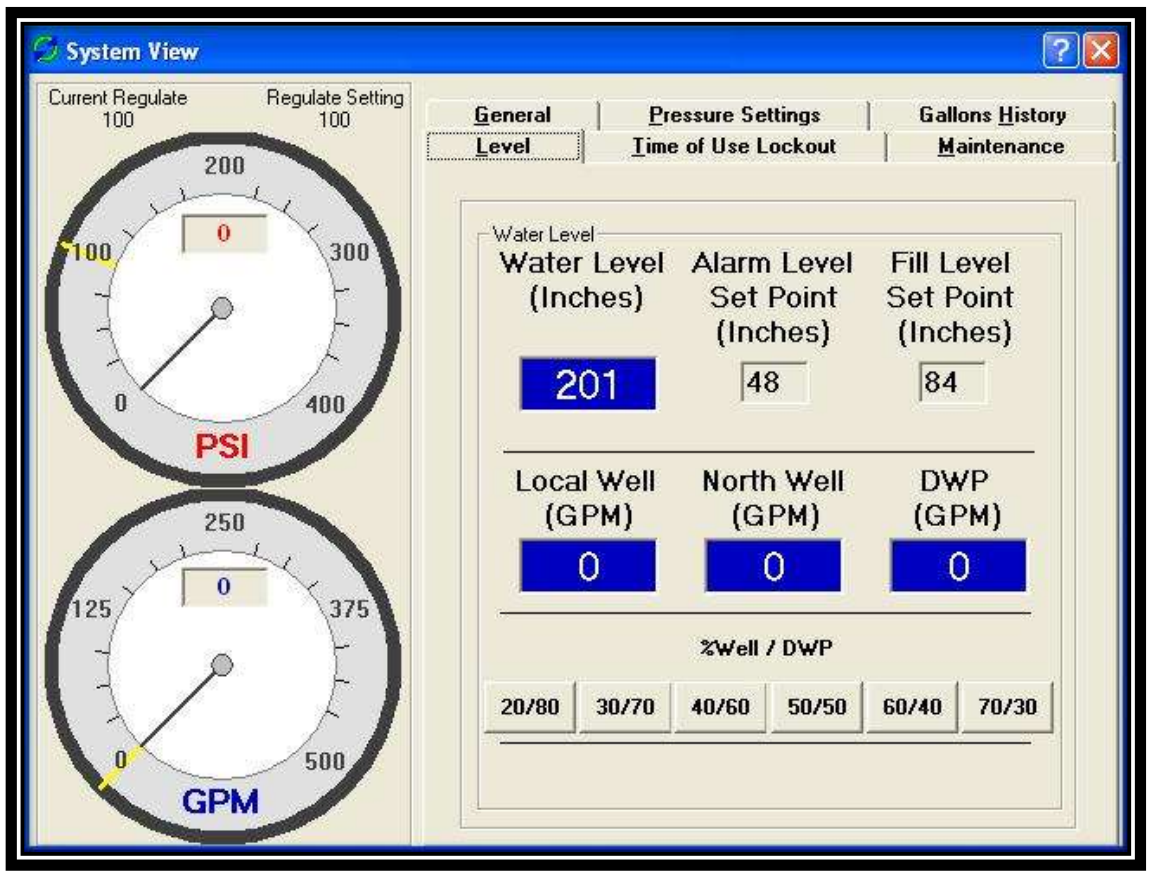
- Control Your Equipment
- Day of Week
- Time of Day
- Pumps
- Lake Fill
- Fertigation
- Other

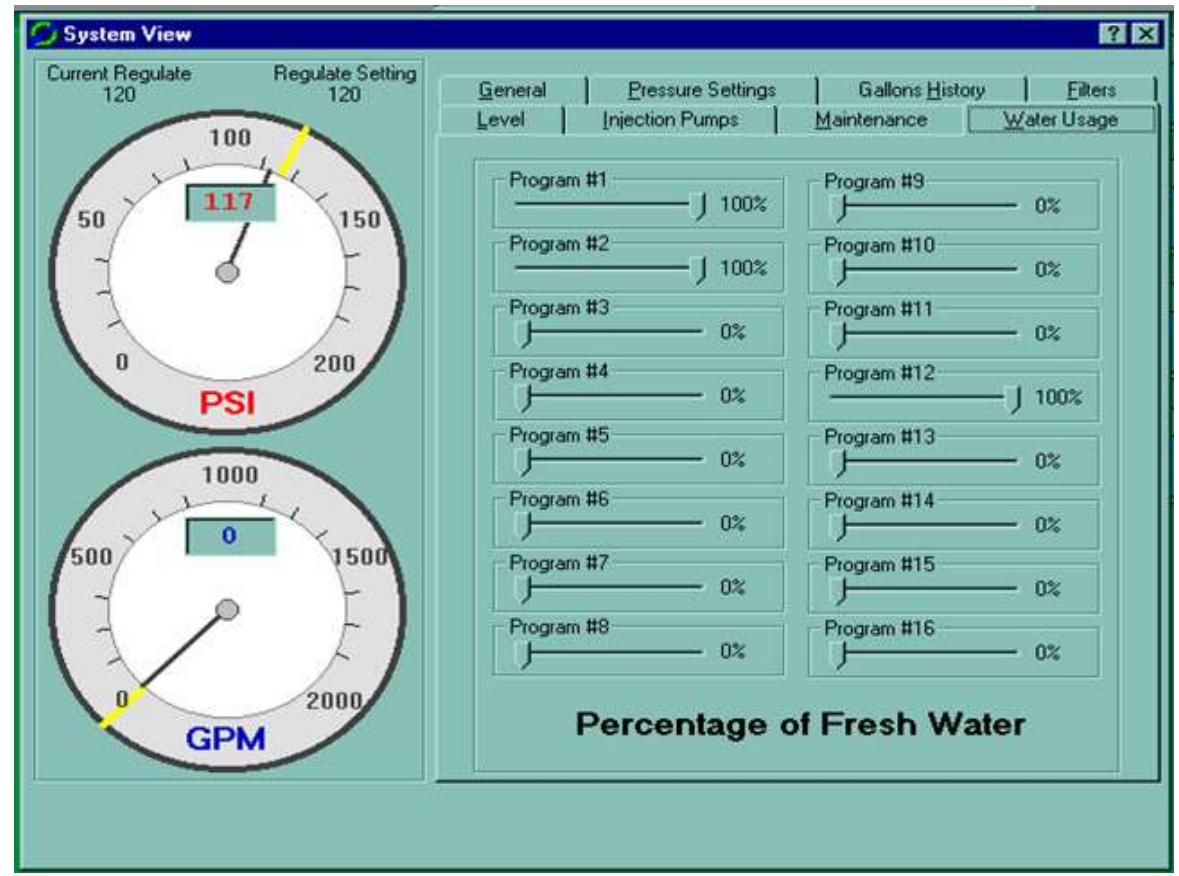
Water Treatment

- Automatic Self-flushing Screen filtration
- Media Filtration (25 micron)
- Ultrafiltration (5 micron)
- UV (disinfection)
- Chlorine (disinfection)
- Ozone (disinfection)
- Reverse Osmosis (ion removal)

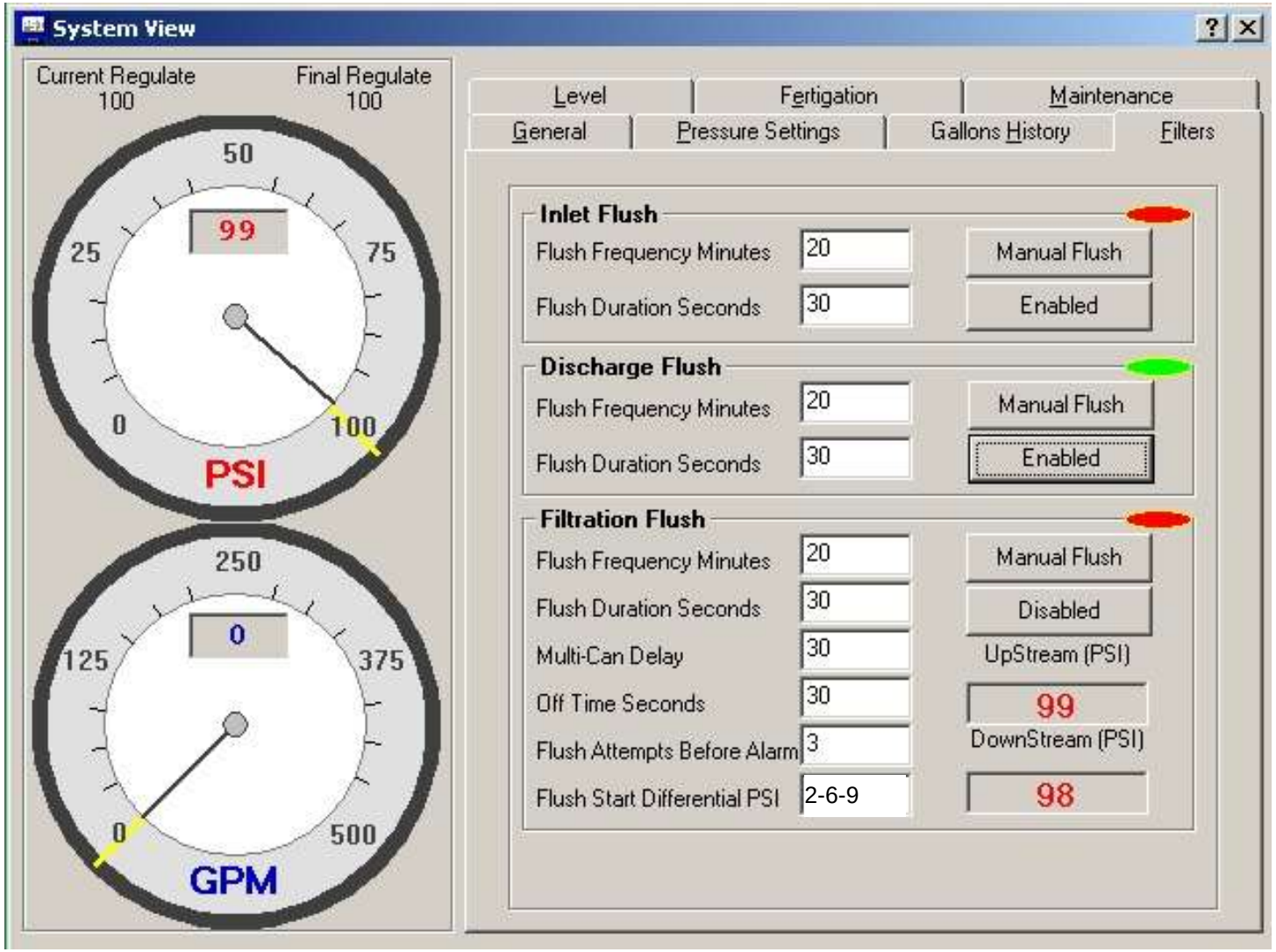


ADVANCE CONTROL FEATURES

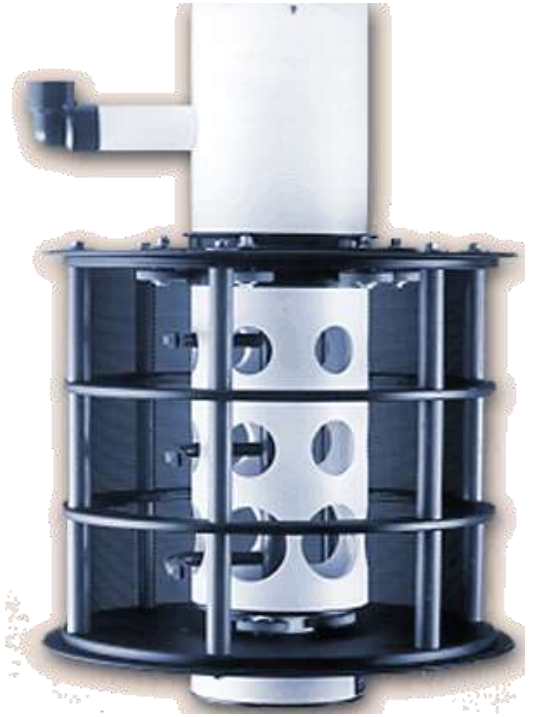




Filter Control



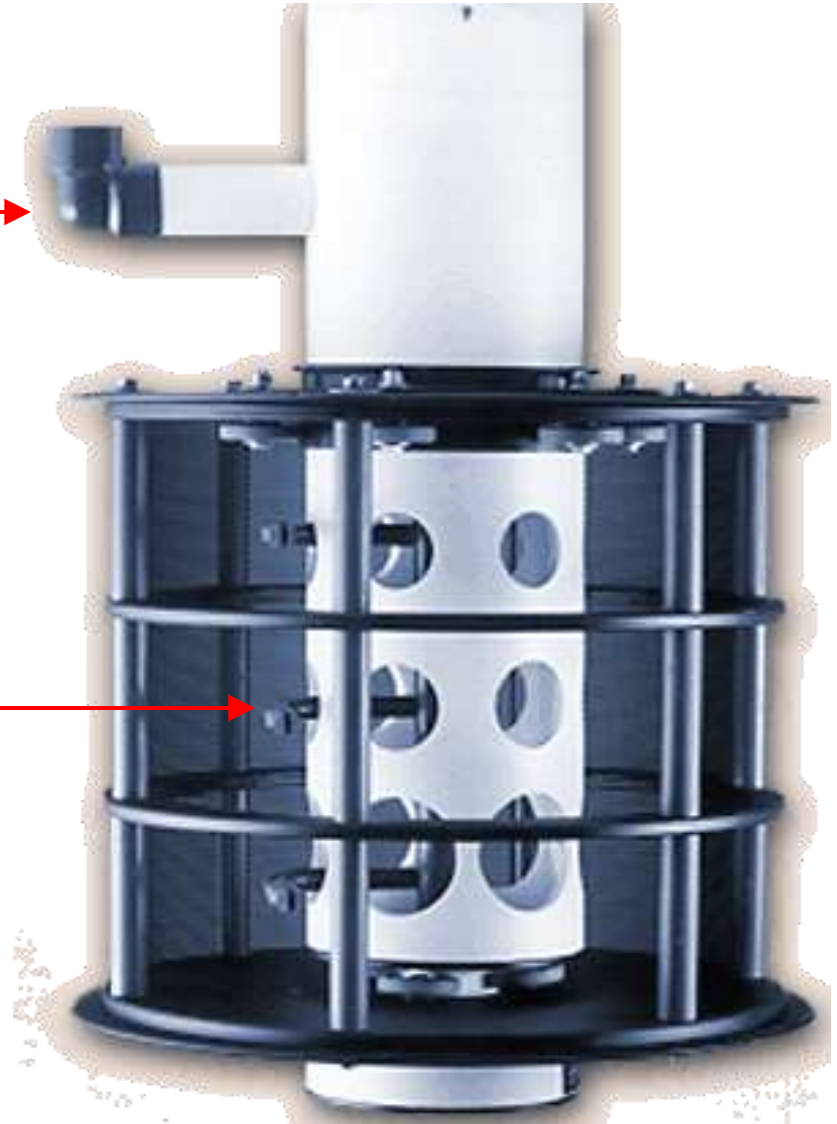
Pre Filtration



Rotating Inlet Screen

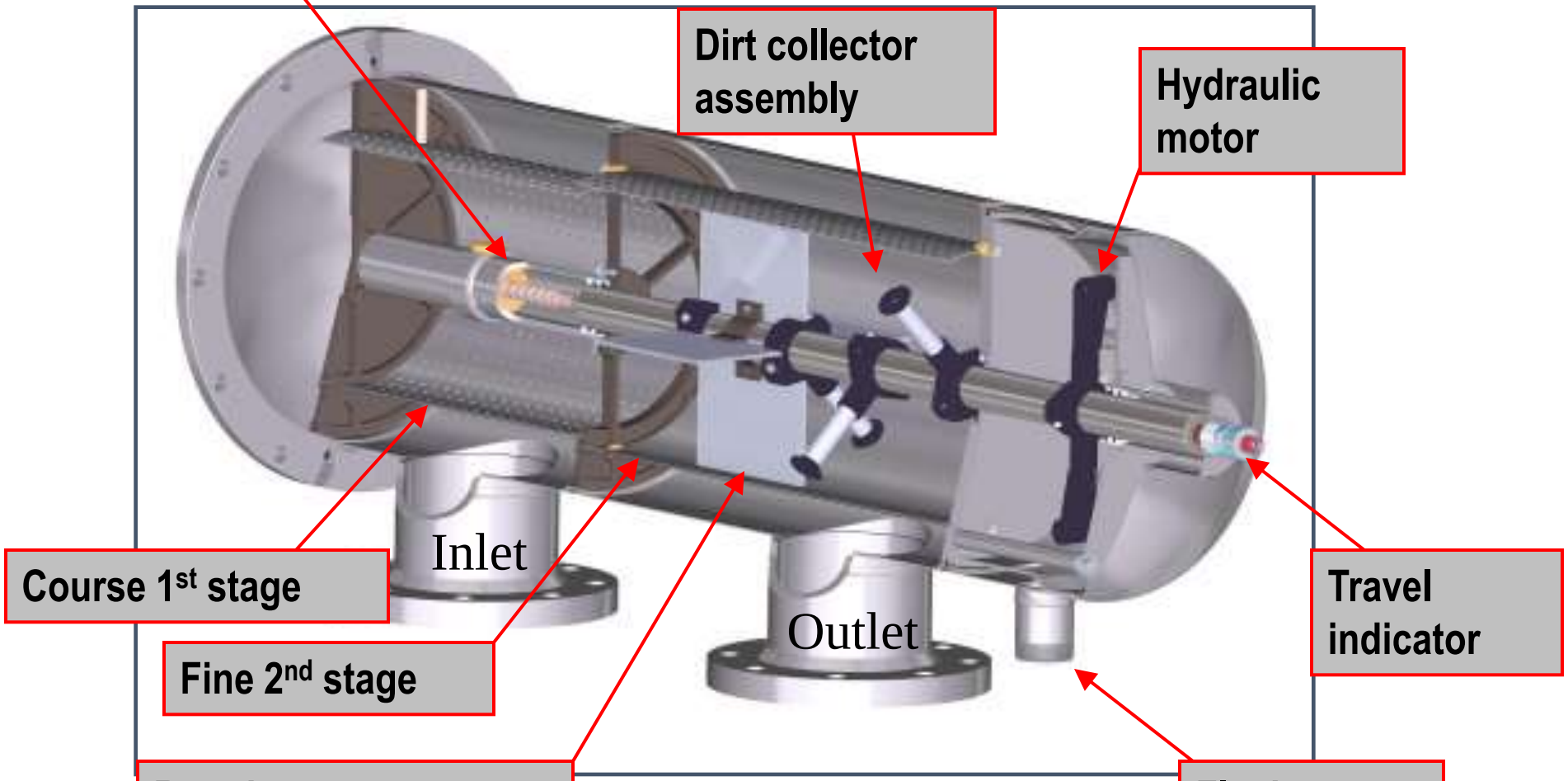
High Pressure Water from Pump Station

Flushing spray nozzles



Discharge Filtration

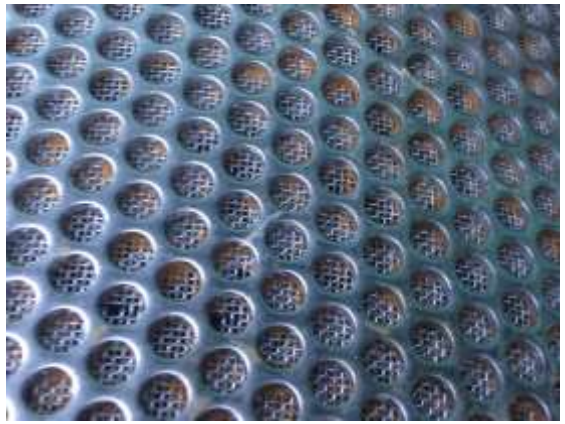
Suction Scanner Filtration



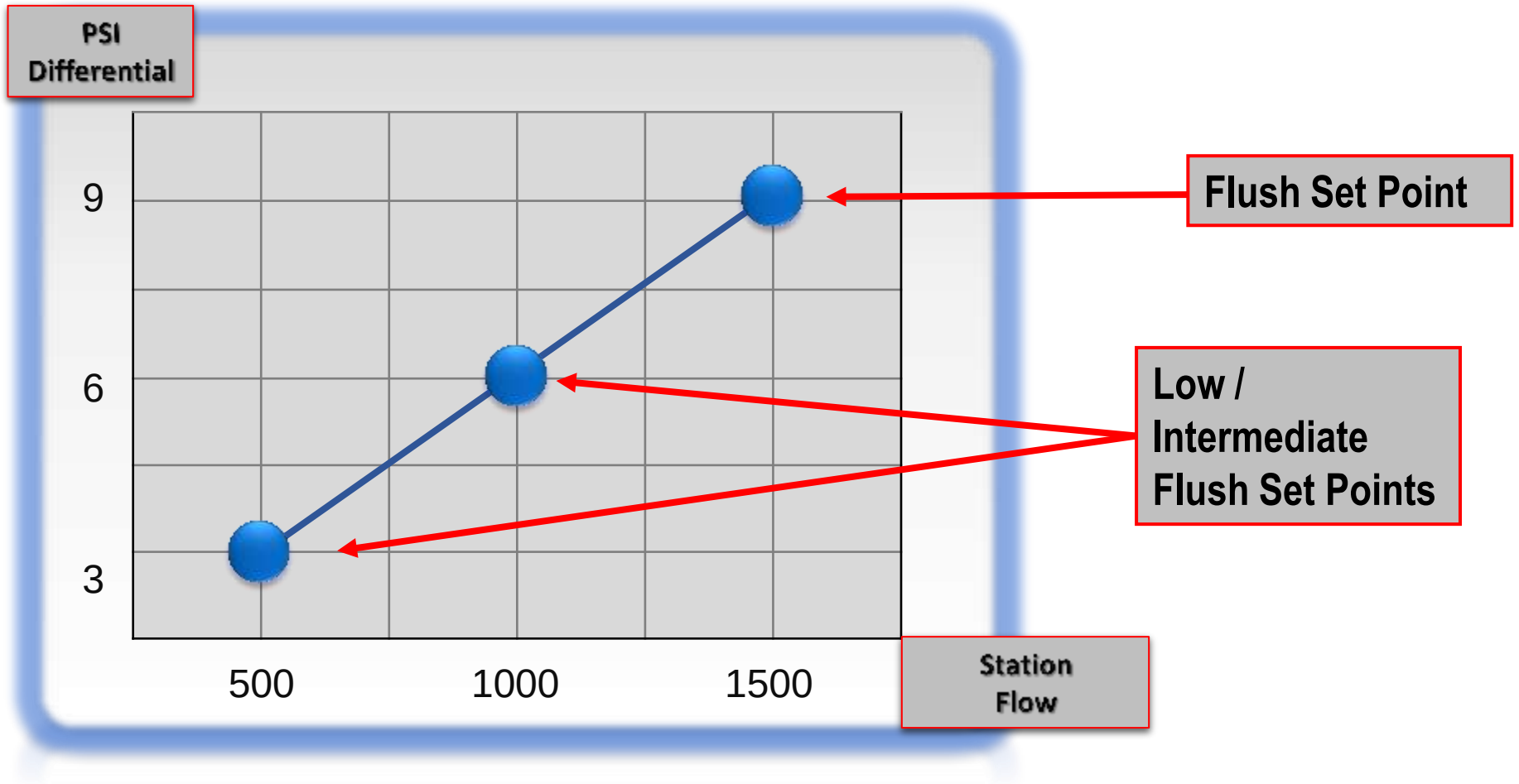
Suction Scanner Filter

Coarse 1st stage (1/4”) Suggest annual inspection/ cleaning

Fine 2nd stage (100 – 500 micron) Auto flush. Inspect quality and uniformity of cleaning.



Advanced Filter Controls



Pump Station Procurement

- Proposal Documents
- Station Drawings
- Delivery

Proposal Documents

- Station Design
- Control Scope
- List of Components
- Services
- Terms & Conditions

Acceptance Terms:

1. Purchaser hereby agrees that in the event of default in the payment of any amount due, that if this account is placed in the hands of an attorney, or agency for collection or legal action, to pay any and all related attorneys fees, costs of collection including agency, private process servers fees, court costs, etc., incurred and any other costs of collection permitted by the laws governing these transactions.
2. Equipment cancelled before completion will incur restocking charges that will be calculated at time of cancellation. Restocking fees may be the full cost of the pump station depending on the nature of the pump station that is cancelled.
3. Equipment shipped separately from the station, at Purchaser's request, may incur additional freight charges, payable by Purchaser.

4. Delayed deliveries by the customer once equipment is ready to ship, will incur minimum storage charges of $200 per week, added to the final invoice.

ACCEPTED BY:

Company Name:_____ By:_____

Print Name:_____ Title:_____

Signature Date: _____ Requested Delivery Date:_____

Is this sale taxable? (circle one) Yes No (If the order is non-taxable, a tax exempt certificate for the "ship to" state must be submitted with this order).

Please Return One Signed Copy of This Quotation On Acceptance. Merchandise delivered or shipped is due and payable to: Watertronics LLC, 525 Industrial Drive, P.O. Box 530, Hartland, WI 53029-0530.
Fax number: 262-367-5551 Phone 262-367-5000.

BILL TO INFORMATION:

Company Name:_____ Phone:_____ Fax:_____ Email Address_____

Billing Address:_____ City:_____ State:_____ Zip Code:_____

Contact Name (Print):_____ Title:_____

SHIP TO INFORMATION:

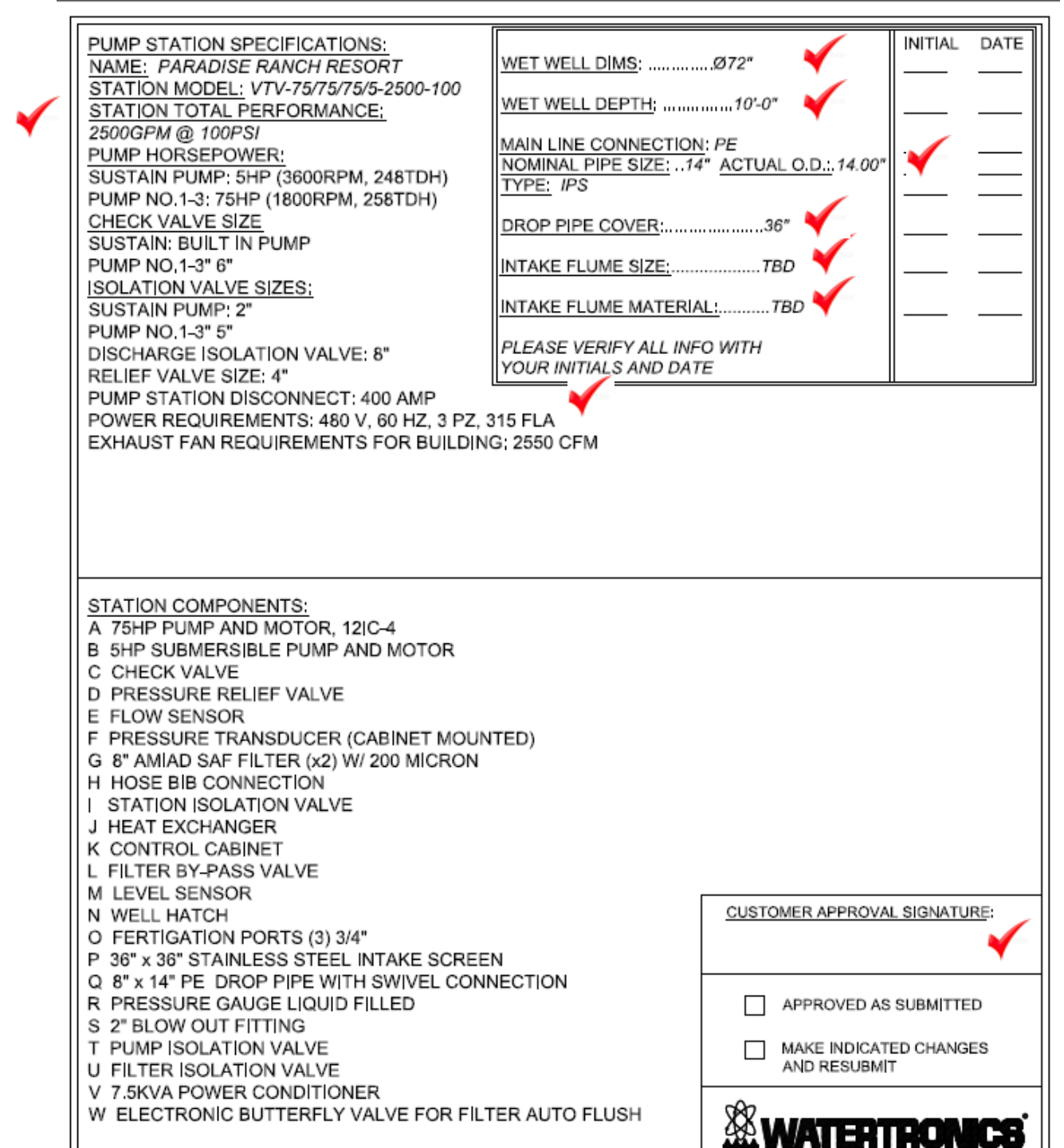
Company Name:_____ Phone:_____ Fax:_____

Shipping Address:_____ City:_____ State:_____ Zip Code:_____

Contact Name (Print):_____ Title: _____ Phone :_____

Station Drawings

- Text View
- Plan View
- Elevation View
- Slab View



PUMP STATION SPECIFICATIONS:
NAME: *PARADISE RANCH RESORT*
STATION MODEL: *VTV-75/75/75/5-2500-100*
STATION TOTAL PERFORMANCE:
2500GPM @ 100PSI
PUMP HORSEPOWER:
SUSTAIN PUMP: 5HP (3600RPM, 248TDH)
PUMP NO.1-3: 75HP (1800RPM, 258TDH)
CHECK VALVE SIZE
SUSTAIN: BUILT IN PUMP
PUMP NO.1-3" 6"
ISOLATION VALVE SIZES:
SUSTAIN PUMP: 2"
PUMP NO.1-3" 5"
DISCHARGE ISOLATION VALVE: 8"
RELIEF VALVE SIZE: 4"
PUMP STATION DISCONNECT: 400 AMP
POWER REQUIREMENTS: 480 V, 60 HZ, 3 PZ, 315 FLA
EXHAUST FAN REQUIREMENTS FOR BUILDING; 2550 CFM

WET WELL DIMS: .....Ø72"
WET WELL DEPTH; .....10'-0"
MAIN LINE CONNECTION: *PE*
NOMINAL PIPE SIZE: ..14" ACTUAL O.D.:.14.00"
TYPE: *IPS*
DROP PIPE COVER:.....36"
INTAKE FLUME SIZE:.....TBD
INTAKE FLUME MATERIAL:.....TBD
PLEASE VERIFY ALL INFO WITH YOUR INITIALS AND DATE

	INITIAL	DATE

STATION COMPONENTS:
A 75HP PUMP AND MOTOR, 12IC-4
B 5HP SUBMERSIBLE PUMP AND MOTOR
C CHECK VALVE
D PRESSURE RELIEF VALVE
E FLOW SENSOR
F PRESSURE TRANSDUCER (CABINET MOUNTED)
G 8" AMIAD SAF FILTER (x2) W/ 200 MICRON
H HOSE BIB CONNECTION
I STATION ISOLATION VALVE
J HEAT EXCHANGER
K CONTROL CABINET
L FILTER BY-PASS VALVE
M LEVEL SENSOR
N WELL HATCH
O FERTIGATION PORTS (3) 3/4"
P 36" x 36" STAINLESS STEEL INTAKE SCREEN
Q 8" x 14" PE DROP PIPE WITH SWIVEL CONNECTION
R PRESSURE GAUGE LIQUID FILLED
S 2" BLOW OUT FITTING
T PUMP ISOLATION VALVE
U FILTER ISOLATION VALVE
V 7.5KVA POWER CONDITIONER
W ELECTRONIC BUTTERFLY VALVE FOR FILTER AUTO FLUSH

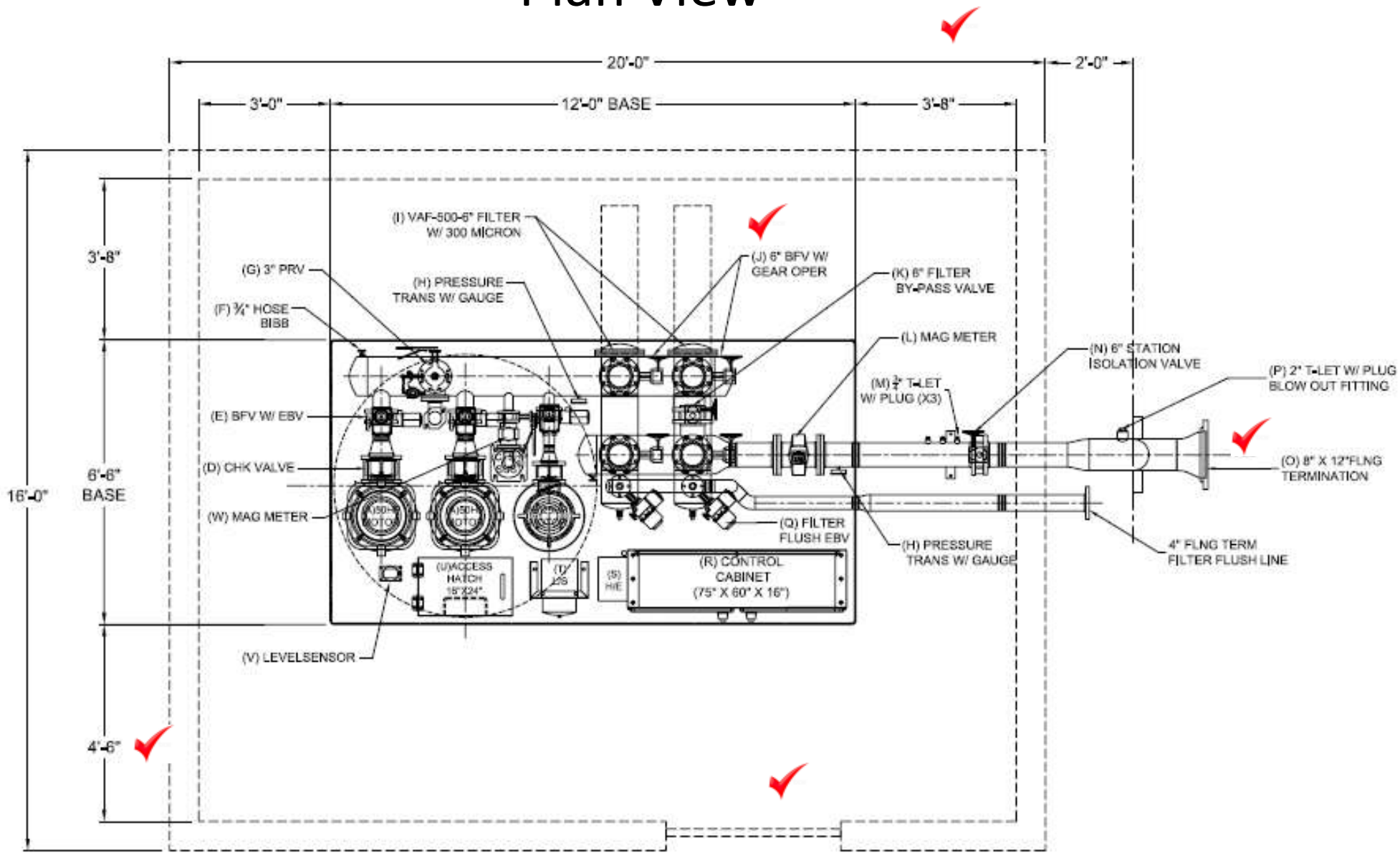
CUSTOMER APPROVAL SIGNATURE:

☐ APPROVED AS SUBMITTED

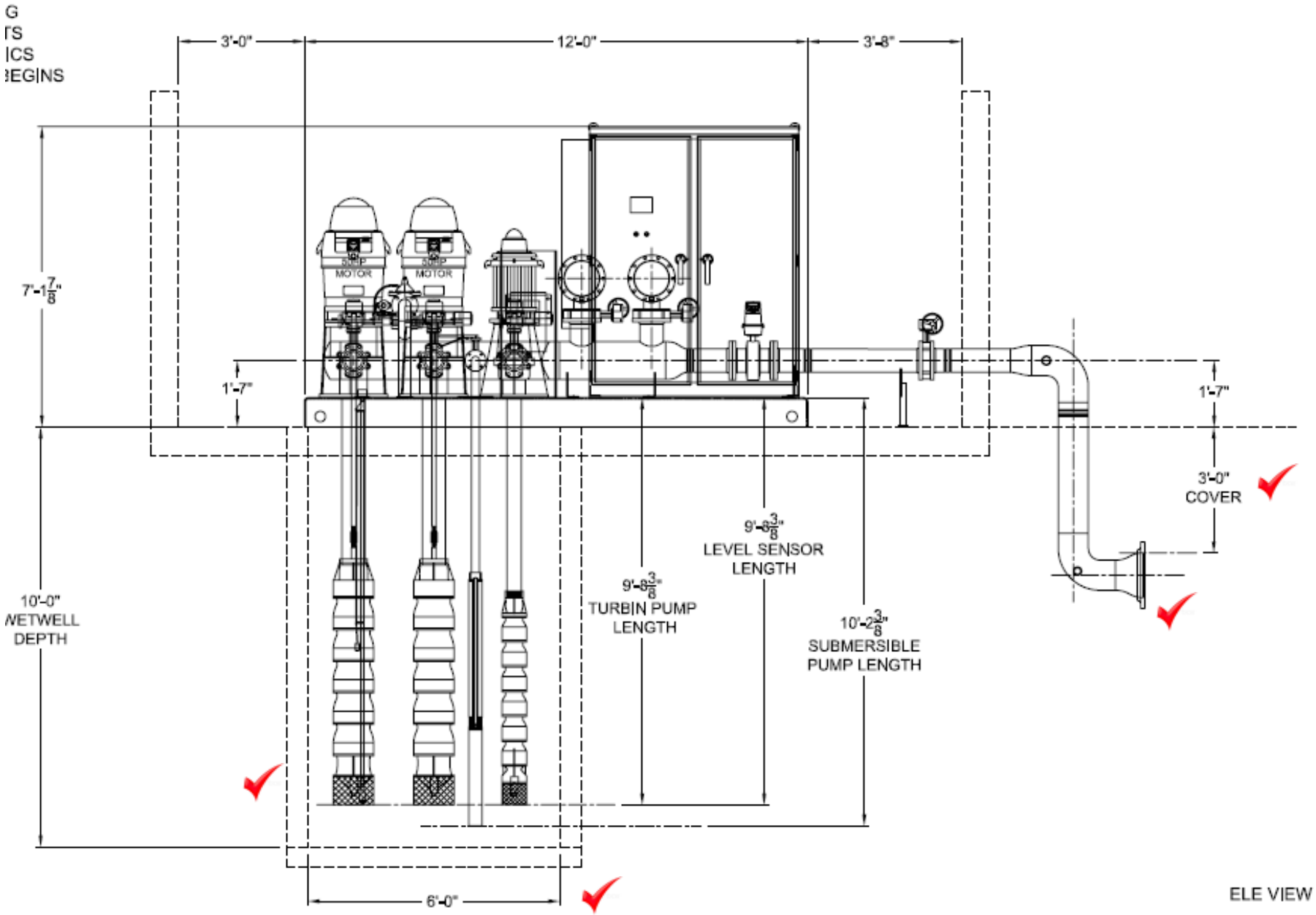
☐ MAKE INDICATED CHANGES AND RESUBMIT

WATERTRONICS

Plan View


20'-0"
2'-0"
3'-0"
12'-0" BASE
3'-8"
16'-0"
3'-8"
6'-6" BASE
4'-6"
(I) VAF-500-6" FILTER W/ 300 MICRON
(J) 6" BFV W/ GEAR OPER
(K) 6" FILTER BY-PASS VALVE
(G) 3" PRV
(H) PRESSURE TRANS W/ GAUGE
(F) ¾" HOSE BIBB
(L) MAG METER
(N) 6" STATION ISOLATION VALVE
(M) ¾" T-LET W/ PLUG (X3)
(P) 2" T-LET W/ PLUG BLOW OUT FITTING
(E) BFV W/ EBV
(D) CHK VALVE
(O) 8" X 12"FLNG TERMINATION
(W) MAG METER
(Q) FILTER FLUSH EBV
(H) PRESSURE TRANS W/ GAUGE
4" FLNG TERM FILTER FLUSH LINE
(U) ACCESS HATCH 15"X24"
(T) LS
(S) H/E
(R) CONTROL CABINET (75" X 60" X 16")
(V) LEVELSENSOR

Elevation View



Pre Delivery Checklist

- ✓ Wet Well
- ✓ Slab
- ✓ Roof Removal
- ✓ Removal of old station
- ✓ Electrical
- ✓ Crane Schedule
- ✓ Technical Service


SMILEY CRANE


V-1000

Pump House Construction

Pit falls - Mother Nature

&

Mud!!!

Pump House Construction

As superintendents we are the GTG (GO TO GUY) that deal with changing issues everyday. Ready to tackle any problem that might come our way. Pump house construction is no different. Get ready for the surprises, pitfalls and pray for rain.

Rockland Coun
Club: A Little

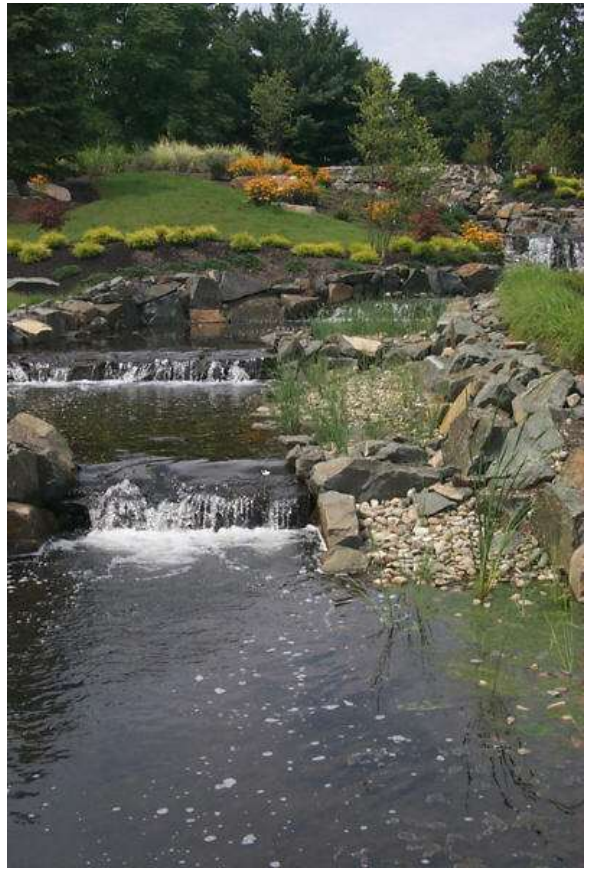
Founded in 1906,

3 acre Pond, spring fed --run off –Stagnant

Current Drought codes

Water falls installed in 2002

Needed to include pumps with new pump house design.



Old Pump House

Pumps were located outside and on top of wet well. Noisy and not very attractive and visible from Club House.

Inside old Pump House.

Early on in the planning process it was decided that we would get permits from the town for a addition instead of a new building. That made the **permit process easier** but there were challenges keeping the current pump house. **** 1/10/14: found our contractor was no longer interested in project.

Preparing area

Several contractors bid work

Slab down – slab up

Ready for contractor # 1

Let the fun begin.

Flooding the neighbors!!!

Removing sediment for intake.

Keeping costs down.

Pumping water out of pond.

Old wet well and pumps have been removed. Part of wall has been removed where addition will be added.

Pumping pond
Mud- Mud

Worried about building falling into wet well.

Dig box was needed

Finally at grade and wet well was put in place.

Ground water was a problem through out the project.

Checking grades and watching building.

Gravel placed arou

Intake complet
the pond fill up

It Didn’t take long to fill in and hide intake.

Ready to start foundation for new floor.

Foundation done. Ready for floors and walls.

Finished Floor

Pumps arrive

Removed Roof

Putting up the walls.

Opportunity to remove bamboo. ----Native landscaping

Walls up just in time for play---April 2nd.

Need to add another Door. But first…

Connecting to system.

Fusing pipe.

Hook up water
pumps ---”Muc
Mountain”

Time for the Green Roof

Special Green Roof Mix

Also Installed Drip Irrigation

Ready for Seed.

Some Germination!!!

Native Plant Landscape

FINAL PRODUCT

(COLOR WAS ABOVE MY PAY-GRADE)

Hand watering winter damage on greens.

Water up and running on May 8th.

THANK Y

Very glad when the water was flowing. All in a days work, as the GTG'S the work some how gets done. You just have to Muddy your boots once in awhile. After all, what could go wrong?