

APPENDIX D:

**DESIGN DRAWINGS
CHARLESTOWN STATE PARK WATER SUPPLY IMPROVEMENTS,
DIVISION II - WELLS, TREATMENT PLANT AND BOOSTER STATION.**

INDIANA DEPARTMENT OF NATURAL RESOURCES

D.A.P.W. PROJECT NO. E030094

CHARLESTOWN STATE PARK

WATER SUPPLY IMPROVEMENTS

DIVISION II

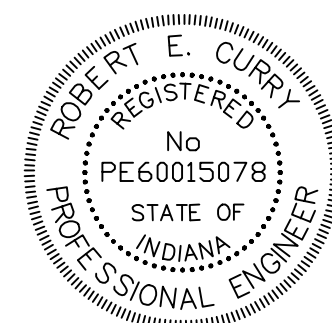
3-700 GPM WATER SUPPLY WELLS

2.0 MGD WATER TREATMENT PLANT

3,000 GPM BOOSTER STATION

DRAWING INDEX

SHEET NO.	SHEET TITLE	SHEET NO.	SHEET TITLE
1	COVER SHEET	19	IRON & MANGANESE REMOVAL PLANT PLAN DETAIL
2	LOCATION MAP & HYDRAULIC SCHEMATIC	20	WTP LIQUID BLEACH CHEMICAL FEED SYSTEM
3	WELL SITE PLAN	21	WTP SODIUM PERMANGANATE & FLUORIDE FEED SYSTEMS
4	WELL NO. 1 SECTION & DETAILS	22	BACKWASH HOLDING TANK PLAN & SECTIONS
5	WELL NO. 2 & 3 SECTION & DETAILS	23	GENERATOR DETAILS
6	WATER TREATMENT PLANT SITE PLAN & GRADING PLAN	24	WTP ELECTRICAL PLAN
7	WTP STORMWATER POLLUTION PREVENTION PLAN	25	WTP ELECTRICAL SCHEMATIC
7A	WTP & B.S. STORMWATER POLLUTION PREVENTION PLAN	26	BOOSTER STATION SITE PLAN
8	WTP FOOTING & FOUNDATION PLAN	27	BOOSTER STATION FOOTING & FOUNDATION PLAN
9	WTP FLOOR PLAN	28	BOOSTER STATION FLOOR PLAN
10	WTP ROOF FRAMING PLAN	29	BOOSTER STATION ROOF FRAMING
11	WTP WALL SECTIONS & DETAILS	30	BOOSTER STATION EXTERIOR ELEVATIONS
12	WTP EXTERIOR ELEVATIONS	31	BOOSTER STATION PIPING PLAN
13	WTP EXTERIOR ELEVATIONS	32	BOOSTER STATION PIPING & PUMP SECTIONS
14	WTP PIPING PLAN	33	BOOSTER STATION PIPING & PUMP SECTIONS
15	WTP PIPING & PUMP SECTIONS	34	BOOSTER STATION ELECTRICAL PLAN
16	WTP PIPING & PUMP SECTIONS	35	BOOSTER STATION ELECTRICAL SCHEMATIC
17	IRON & MANGANESE REMOVAL PLANT PLAN & SECTION	36	STANDARD DETAILS
18	IRON & MANGANESE REMOVAL PLANT FOOTING & FOUNDATION PLAN		



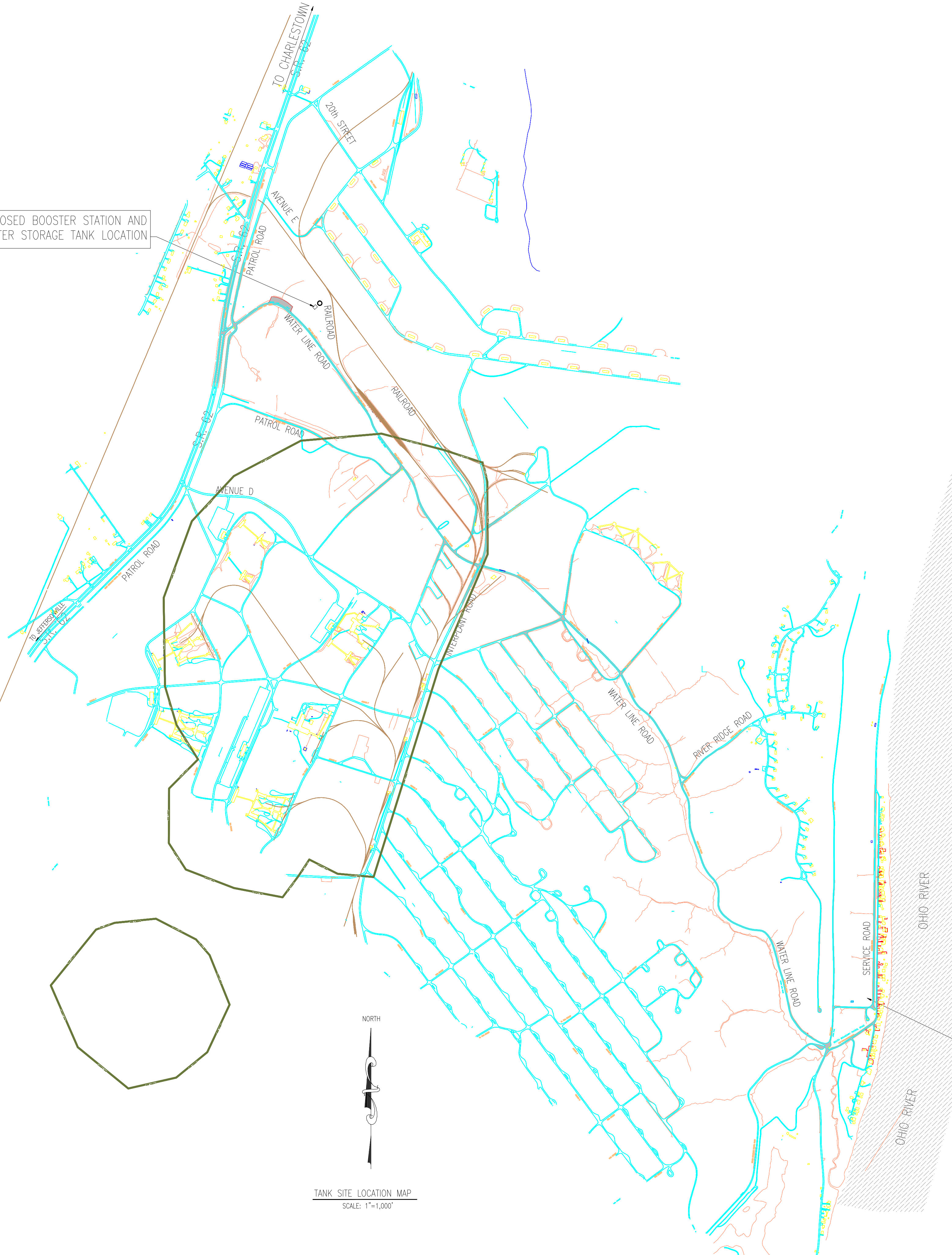
NOVEMBER 5, 2009

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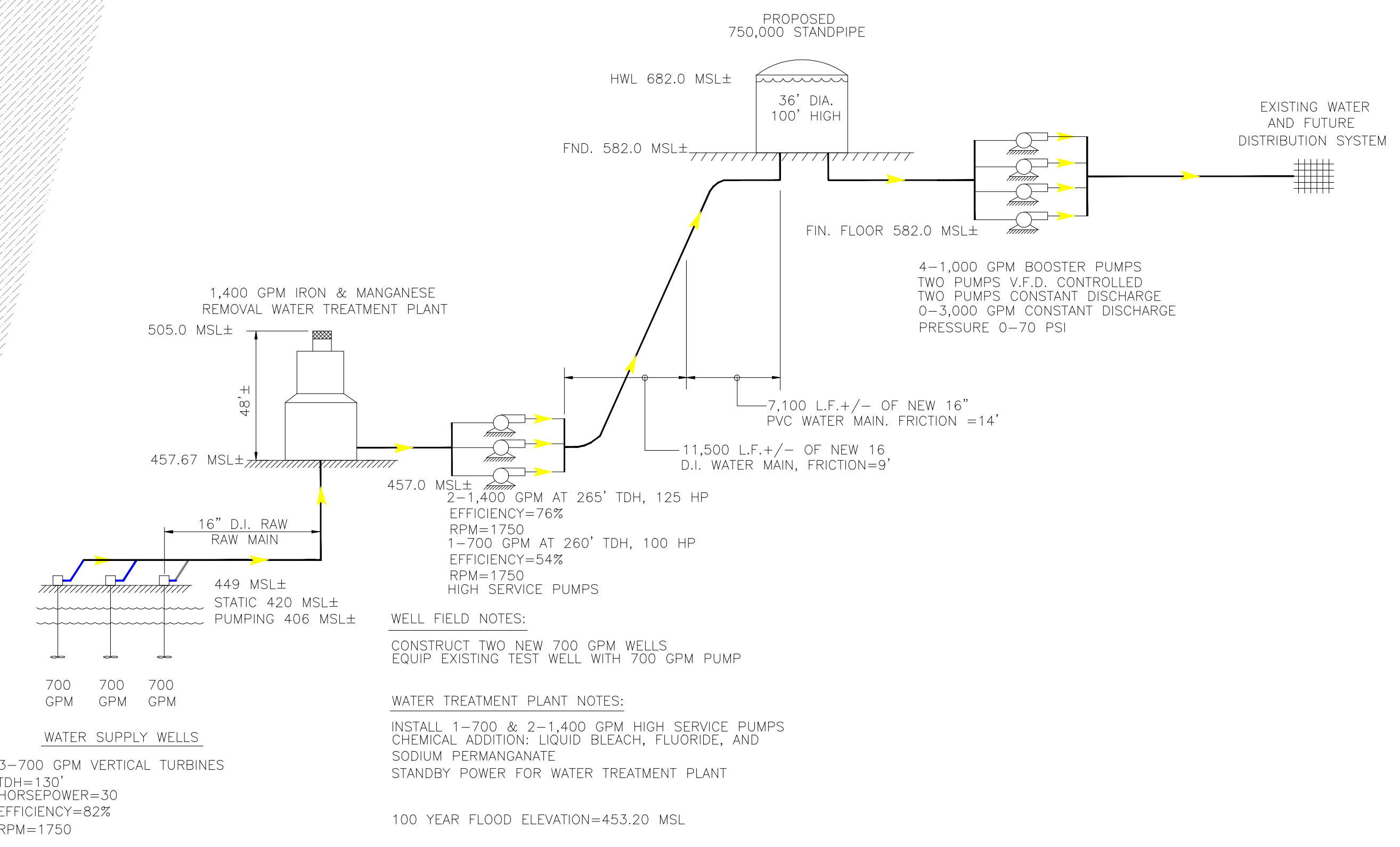
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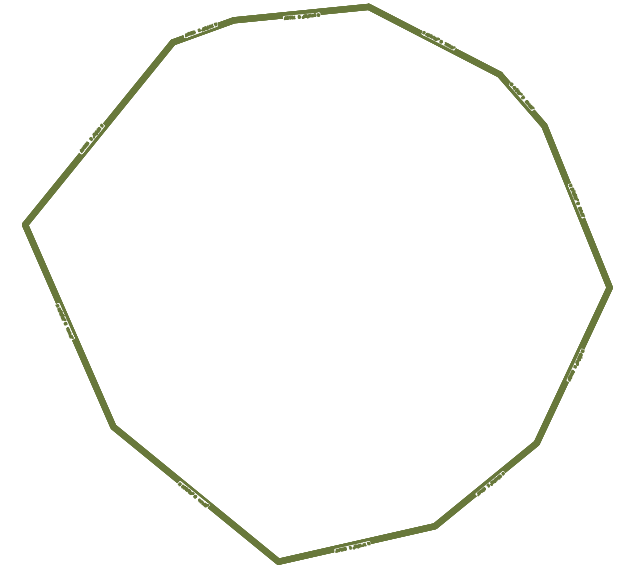
PROPOSED BOOSTER STATION AND STANDPIPE WATER STORAGE TANK LOCATION



PROPOSED WELLS & WTP LOCATIONS

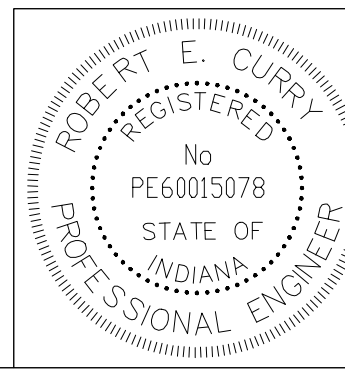


CHARLESTOWN STATE PARK WATER SUPPLY IMPROVEMENTS
HYDRAULIC SCHEMATIC
NO SCALE



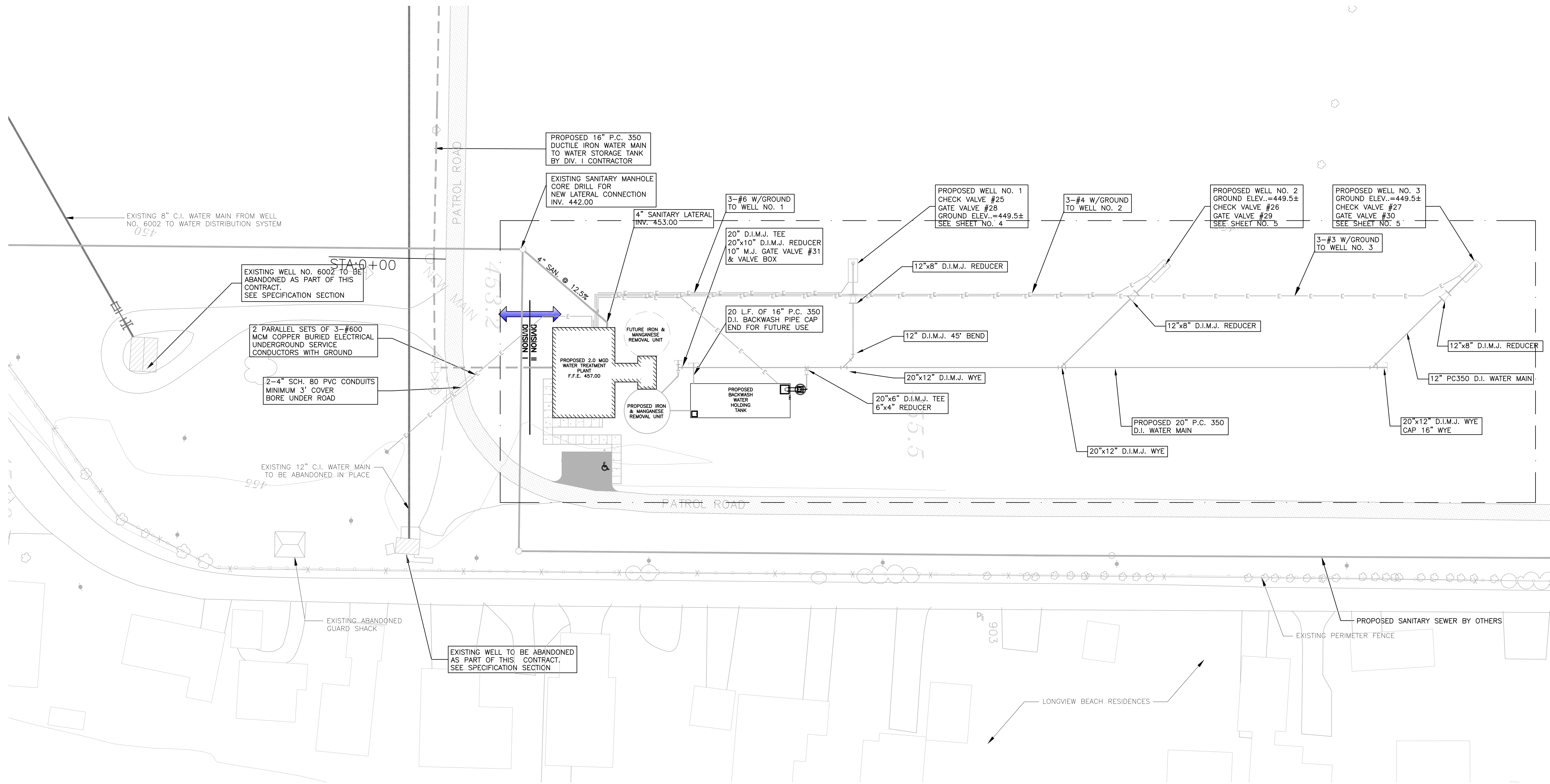
TANK SITE LOCATION MAP
SCALE: 1"=1,000'

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INDIANA DEPARTMENT OF NATURAL RESOURCES D.A.P.W. PROJECT NO. E030094		DATE:	APPROVED BY:	DRAWING NUMBER:
CHARLESTOWN STATE PARK WATER SUPPLY IMPROVEMENTS DIVISION II-WELLS, WTP & BOOSTER STATION		11-05-09		2 OF 36
LOCATION MAP & HYDRAULIC SCHEMATIC				

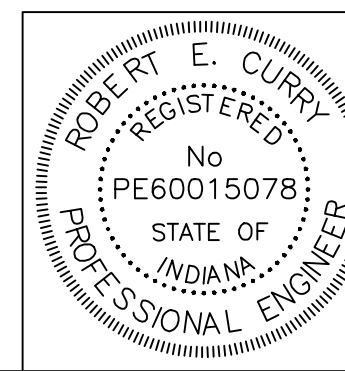
C:\Engineering Projects\Water\DNCHARLESTOWN WATERWELLS, WTP & BOOSTER STATION\3 Well Site Plan.dwg 3/11/2010 11:33 AM Jerry Luedeman



1 WELL & WATER MAIN SITE PLAN
 3 1" = 30'

LEGEND	
— 66.1 —	EXISTING GRADE
— — —	PROPOSED GRADE
x 454.6	EXISTING SPOT GRADE
x 454.6	PROPOSED SPOT GRADE
●	EXISTING POWER POLES
— OHP —	EXISTING OVERHEAD POWER
— — —	EXISTING PIPING
— U.E. —	PROPOSED UNDERGROUND ELECTRICAL

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CHARLESTOWN STATE PARK WATER SUPPLY IMPROVEMENTS DIVISION II—WELLS, WTP & BOOSTER STATION		DATE:	APPROVED BY:	DRAWING NUMBER:
WELL SITE PLAN				

WELL PUMP & DISCHARGE DATA SUMMARY															
WELL PUMP NO.	MANUFACTURER	MODEL	PUMP CAPACITY	TDH	MINIMUM EFFICIENCY	WELL PUMP DATA				DISCHARGE HEAD DATA					
						STAGES	COLUMN DIAMETER	COLUMN ENDS	COLUMN WALL THICKNESS	SHAFT MATERIAL	SHAFT DIAMETER	MATERIAL	FLANGE RATING	SHAFT SEAL	AIR RELEASE VALVE
1	AMERICAN-MARSH	1215	700 GPM	130'	82%	2	8"	THREADED	.322"	416 STAINLESS STEEL	1.5"	CAST IRON	150 PSI	PACKING GLAND	2"

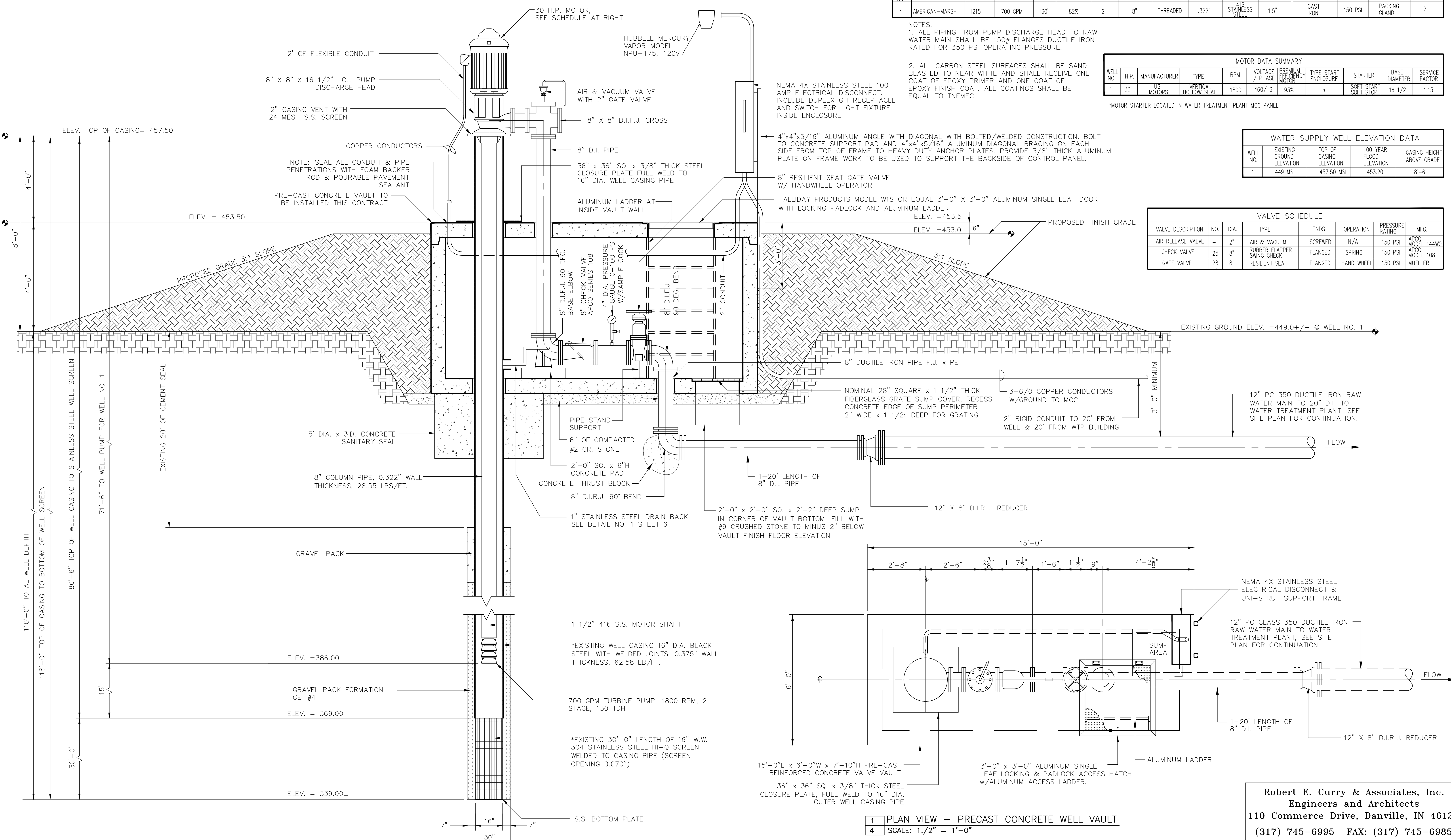
NOTES:
 1. ALL PIPING FROM PUMP DISCHARGE HEAD TO RAW WATER MAIN SHALL BE 150# FLANGES DUCTILE IRON RATED FOR 350 PSI OPERATING PRESSURE.

MOTOR DATA SUMMARY											
WELL NO.	H.P.	MANUFACTURER	TYPE	RPM	VOLTAGE / PHASE	EFFICIENCY	TYPE START ENCLOSURE	STARTER	BASE DIAMETER	SERVICE FACTOR	
1	30	US MOTORS	VERTICAL HOLLOW SHAFT	1800	460/3	93%	*	SOFT START	16 1/2	1.15	

*MOTOR STARTER LOCATED IN WATER TREATMENT PLANT MCC PANEL

WATER SUPPLY WELL ELEVATION DATA				
WELL NO.	EXISTING GROUND ELEVATION	TOP OF CASING ELEVATION	100 YEAR FLOOD ELEVATION	CASING HEIGHT ABOVE GRADE
1	449 MSL	457.50 MSL	453.20	8'-6"

VALVE SCHEDULE							
VALVE DESCRIPTION	NO.	DIA.	TYPE	ENDS	OPERATION	PRESSURE RATING	MFG.
AIR RELEASE VALVE	-	2"	AIR & VACUUM	SCREWED	N/A	150 PSI	APCO MODEL 144WO
CHECK VALVE	25	8"	RUBBER FLAPPER SWING CHECK	FLANGED	SPRING	150 PSI	APCO MODEL 108
GATE VALVE	28	8"	RESILIENT SEAT	FLANGED	HAND WHEEL	150 PSI	MUELLER



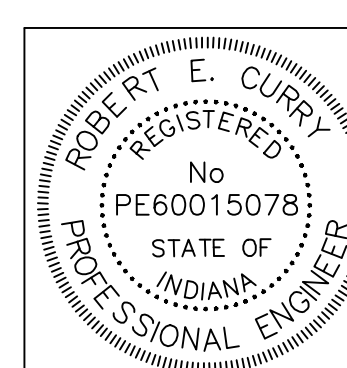
2 WELL NO. 1 SECTION
 4 SCALE: 1/2" = 1'-0"

1 PLAN VIEW - PRECAST CONCRETE WELL VAULT
 4 SCALE: 1/2" = 1'-0"

NOTE:
 * DENOTES EXISTING ITEM NOT A PART OF THIS CONTRACT
 ALL WORK SHOWN ON THIS SHEET EXCEPT 16"x34" GRAVEL PACK, WELL, CASING, WELL SCREEN, DEVELOPMENT AND PUMP TESTING HAVE BEEN PREVIOUSLY CONSTRUCTED. EXTEND EXISTING WELL CASING TO MATCH CASING HEIGHT SHOWN ABOVE.

THIS PROJECT IS TO FURNISH ALL COMPONENTS SHOWN EXCEPT FOR WELL CASING, WELL SCREEN AND WELL SEAL.

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 CHARLESTOWN STATE PARK WATER SUPPLY IMPROVEMENTS DIVISION II-WELLS, WTP & BOOSTER STATION
 WELL NO. 1 SECTION & DETAILS
 DATE: 11-05-09 APPROVED BY: DRAWING NUMBER: 4 OF 36

WELL PUMP & DISCHARGE DATA SUMMARY															
WELL PUMP NO.	WELL PUMP DATA								DISCHARGE HEAD DATA						
	MANUFACTURER	MODEL	PUMP CAPACITY	TDH	MINIMUM EFFICIENCY	STAGES	COLUMN DIAMETER	COLUMN ENDS	COLUMN WALL THICKNESS	SHAFT MATERIAL	SHAFT DIAMETER	MATERIAL	FLANGE RATING	SHAFT SEAL	AIR RELEASE VALVE
2	AMERICAN-MARSH	1215	700 GPM	380'	79%	4	8"	THREADED	.322"	STAINLESS STEEL	1.5"	CAST IRON	150 PSI	PACKING GLAND	2"
3	AMERICAN-MARSH	1215	700 GPM	380'	79%	4	8"	THREADED	.322"	STAINLESS STEEL	1.5"	CAST IRON	150 PSI	PACKING GLAND	2"

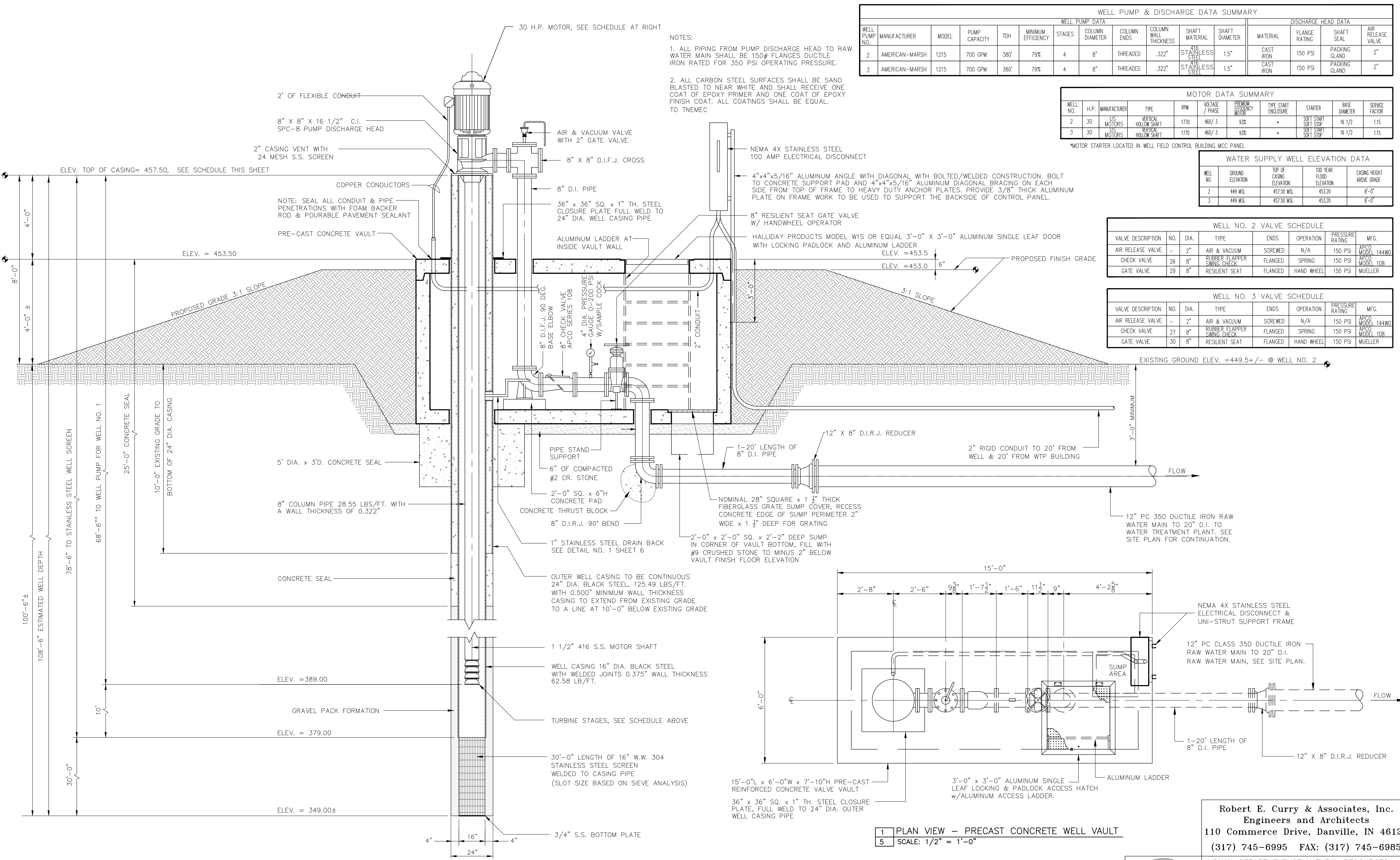
MOTOR DATA SUMMARY											
WELL NO.	H.P.	MANUFACTURER	TYPE	RPM	VOLTAGE / PHASE	EFFICIENCY	TYPE START ENCLOSURE	STARTER	BASE DIAMETER	SERVICE FACTOR	
2	30	US MOTORS	VERTICAL HOLLOW SHAFT	1770	460/3	93%	*	SOFT START SOFT STOP	16 1/2	1.15	
3	30	US MOTORS	VERTICAL HOLLOW SHAFT	1770	460/3	93%	*	SOFT START SOFT STOP	16 1/2	1.15	

*MOTOR STARTER LOCATED IN WELL FIELD CONTROL BUILDING MCC PANEL

WATER SUPPLY WELL ELEVATION DATA				
WELL NO.	GROUND ELEVATION	TOP OF CASING ELEVATION	100 YEAR FLOOD ELEVATION	CASING HEIGHT ABOVE GRADE
2	449 MSL	457.50 MSL	453.20	8'-0"
3	449 MSL	457.50 MSL	453.20	8'-0"

WELL NO. 2 VALVE SCHEDULE							
VALVE DESCRIPTION	NO.	DIA.	TYPE	ENDS	OPERATION	PRESSURE RATING	MFG.
AIR RELEASE VALVE	-	2"	AIR & VACUUM	SCREWED	N/A	150 PSI	APCO MODEL 144WD
CHECK VALVE	26	8"	RUBBER FLAPPER SWING CHECK	FLANGED	SPRING	150 PSI	APCO MODEL 108
GATE VALVE	29	8"	RESILIENT SEAT	FLANGED	HAND WHEEL	150 PSI	MUELLER

WELL NO. 3 VALVE SCHEDULE							
VALVE DESCRIPTION	NO.	DIA.	TYPE	ENDS	OPERATION	PRESSURE RATING	MFG.
AIR RELEASE VALVE	-	2"	AIR & VACUUM	SCREWED	N/A	150 PSI	APCO MODEL 144WD
CHECK VALVE	27	8"	RUBBER FLAPPER SWING CHECK	FLANGED	SPRING	150 PSI	APCO MODEL 108
GATE VALVE	30	8"	RESILIENT SEAT	FLANGED	HAND WHEEL	150 PSI	MUELLER



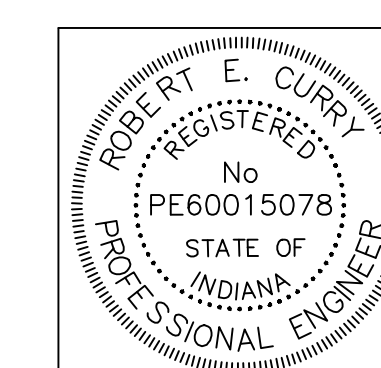
NOTES:
 1. ALL PIPING FROM PUMP DISCHARGE HEAD TO RAW WATER MAIN SHALL BE 150# FLANGES DUCTILE IRON RATED FOR 350 PSI OPERATING PRESSURE.
 2. ALL CARBON STEEL SURFACES SHALL BE SAND BLASTED TO NEAR WHITE AND SHALL RECEIVE ONE COAT OF EPOXY PRIMER AND ONE COAT OF EPOXY FINISH COAT. ALL COATINGS SHALL BE EQUAL TO TNAMEC

1 PLAN VIEW - PRECAST CONCRETE WELL VAULT
 5 SCALE: 1/2" = 1'-0"

2 WELL NO. 2 & NO. 3 SECTION
 5 SCALE: 1/2" = 1'-0"

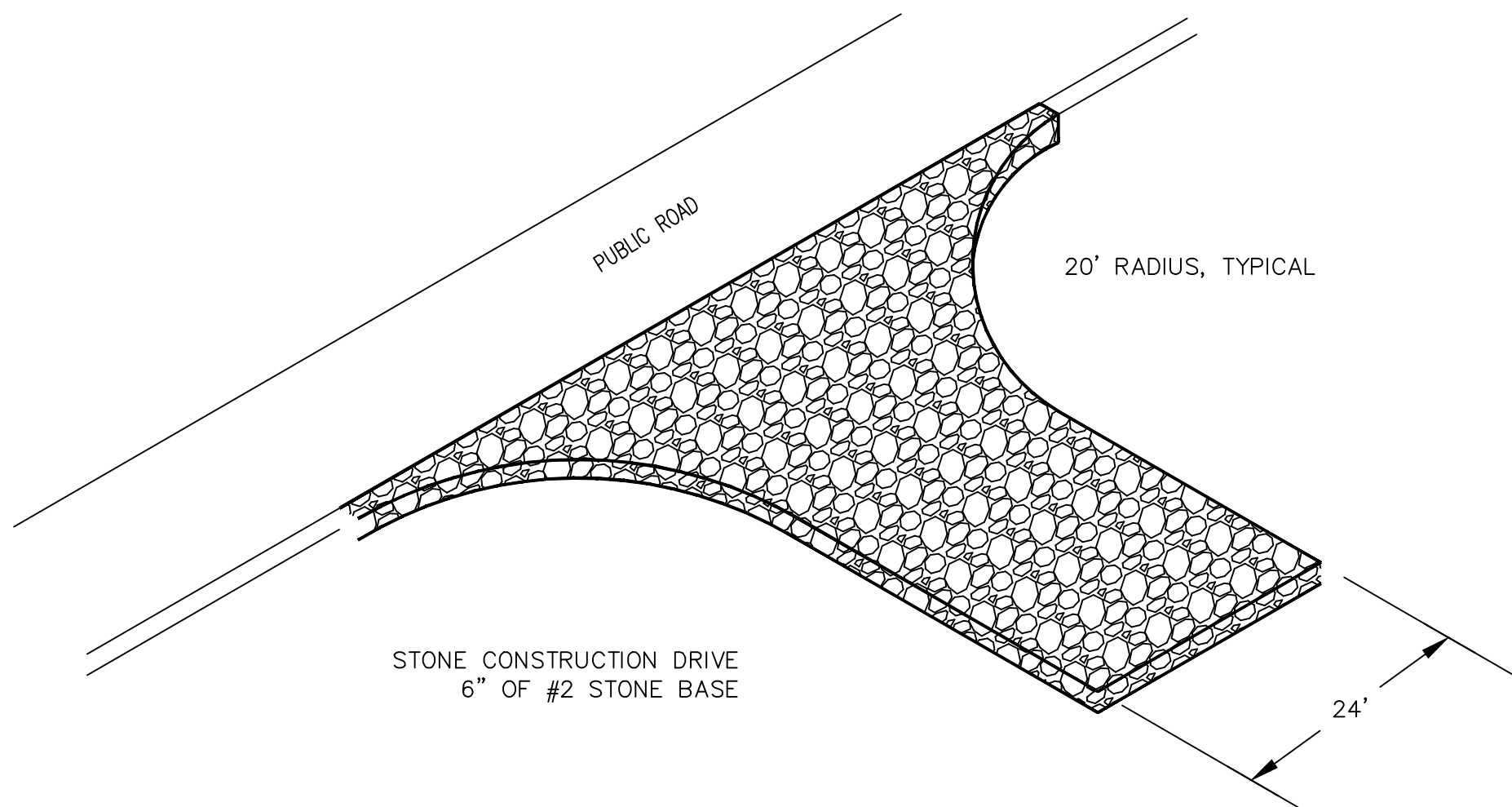
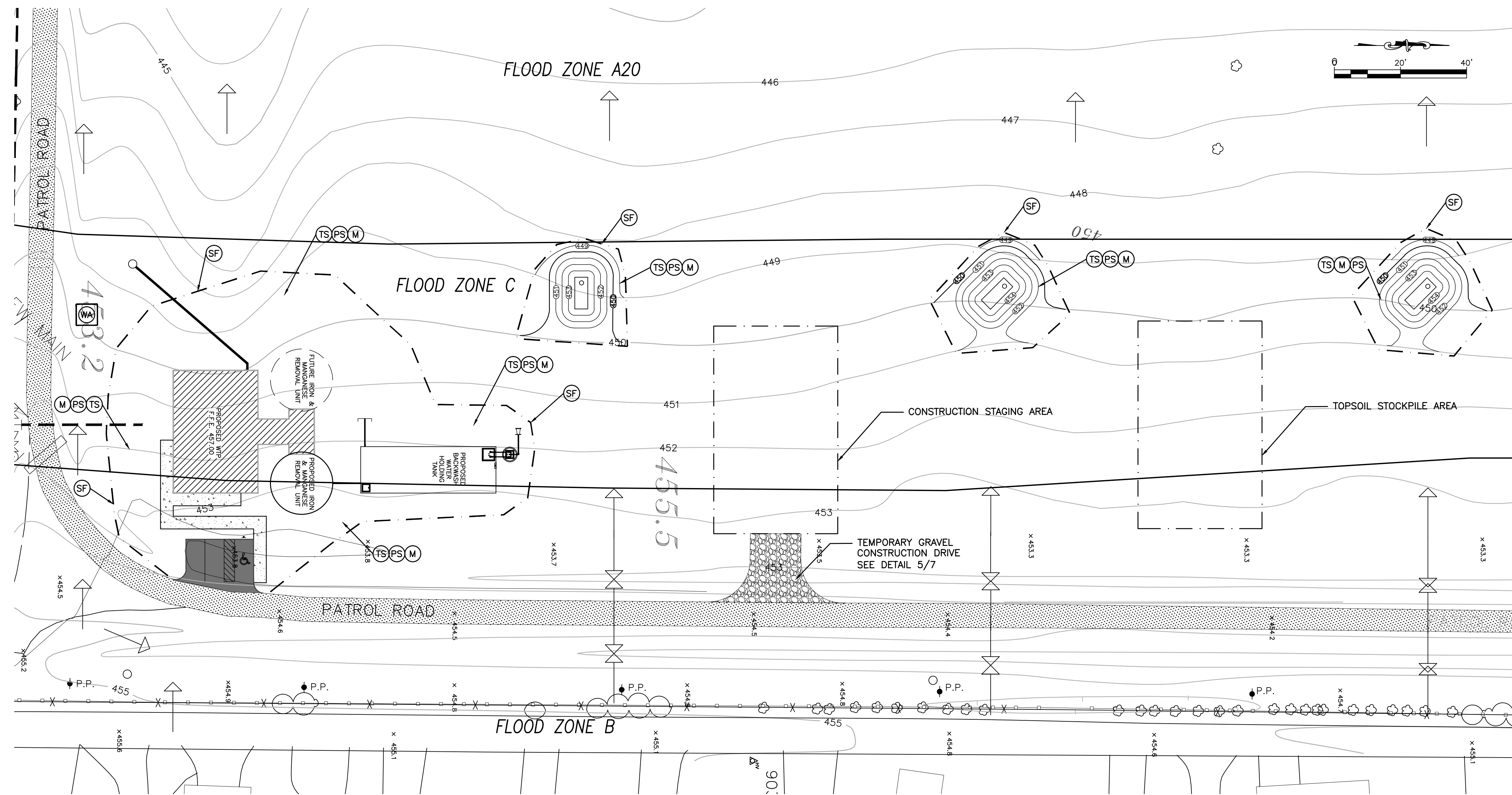
NOTE:
 ALL WORK SHOWN ON THIS SHEET IS NEW CONSTRUCTION AND SHALL BE INCLUDED IN DIVISION II

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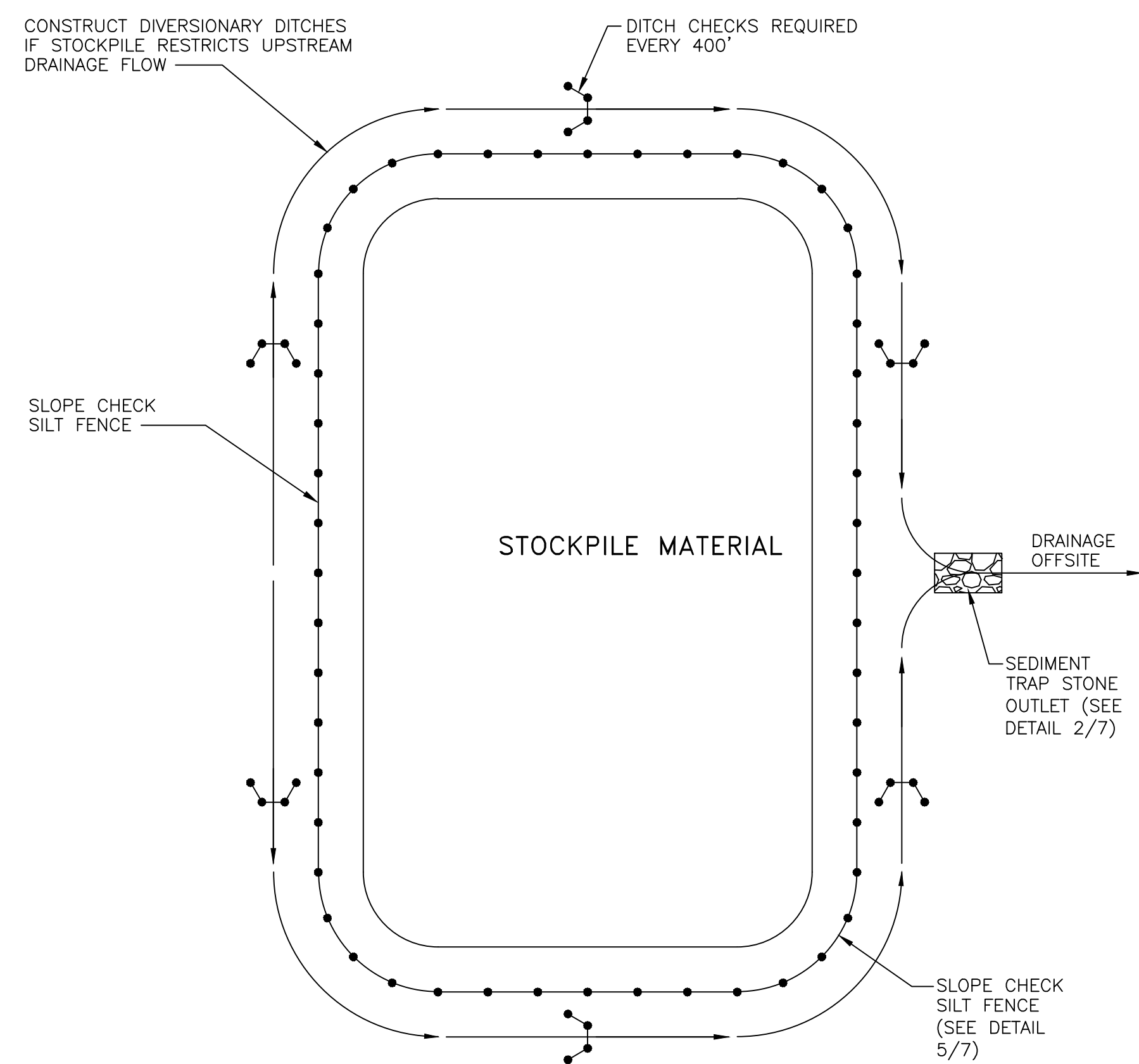


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 WELLS NO. 2 & 3 SECTION & DETAILS
 DATE: 11-05-09 APPROVED BY: DRAWING NUMBER: 5 OF 36

Q:\Engineering Projects\WATER\DNRY\CHARLESTOWN WATER\Wells, WTP & Booster Station\5 Well No.2.dwg 3/11/2010 dmark

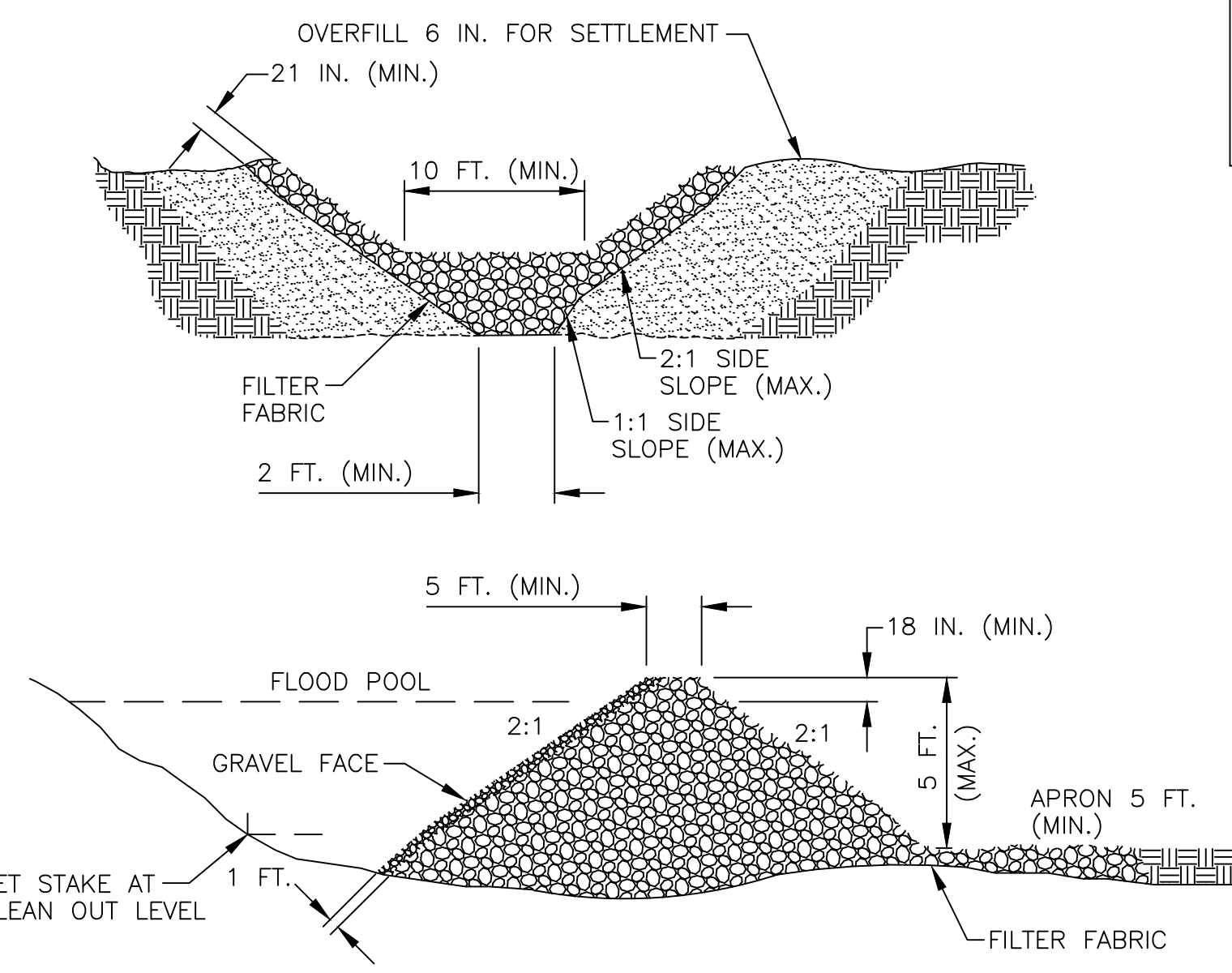


5 TEMPORARY CONSTRUCTION DRIVE
7 NO SCALE

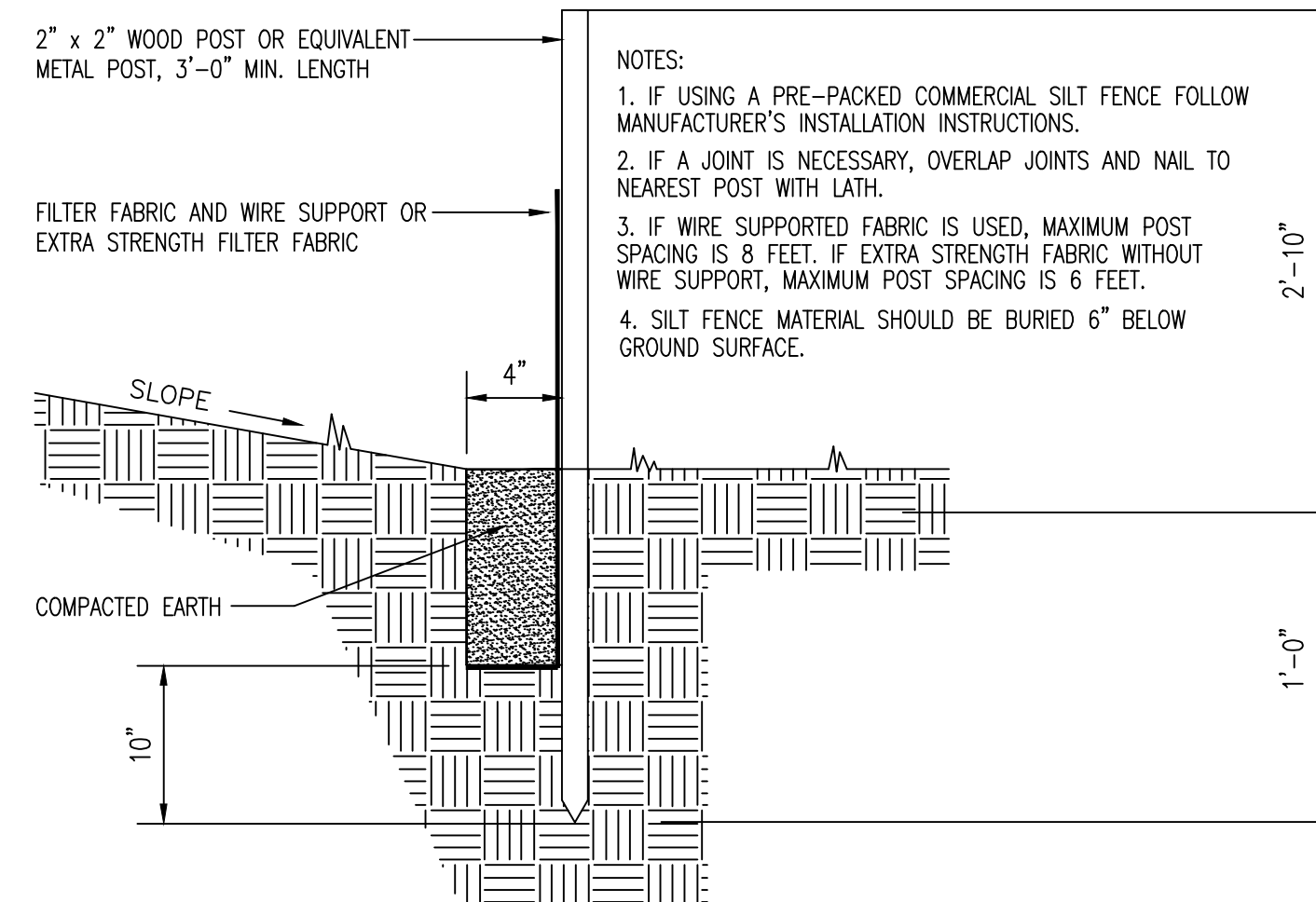


3 TOPSOIL STOCKPILE EROSION CONTROL
7 NO SCALE

1 WATER TREATMENT PLANT
7 STORMWATER POLLUTION PREVENTION PLAN
1" = 30'



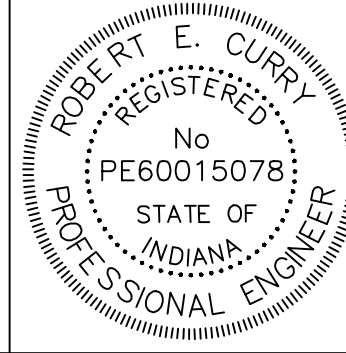
2 SEDIMENT TRAP STONE OUTLET
7 NO SCALE



4 SILT FENCE DETAIL
7 NO SCALE

LEGEND			
— 993 —	EXISTING GRADE	(SF)	SILT FENCE
— 993 —	PROPOSED GRADE	(TS)	TEMPORARY SEEDING
— X —	EXISTING CHAIN LINK FENCE	(PS)	PERMANENT SEEDING
X 927.5	EXISTING SPOT GRADE	(M)	MULCH
X 927.5	PROPOSED SPOT GRADE		
△	EXISTING DRAINAGE FLOW		
(WA)	CONCRETE WASHOUT		

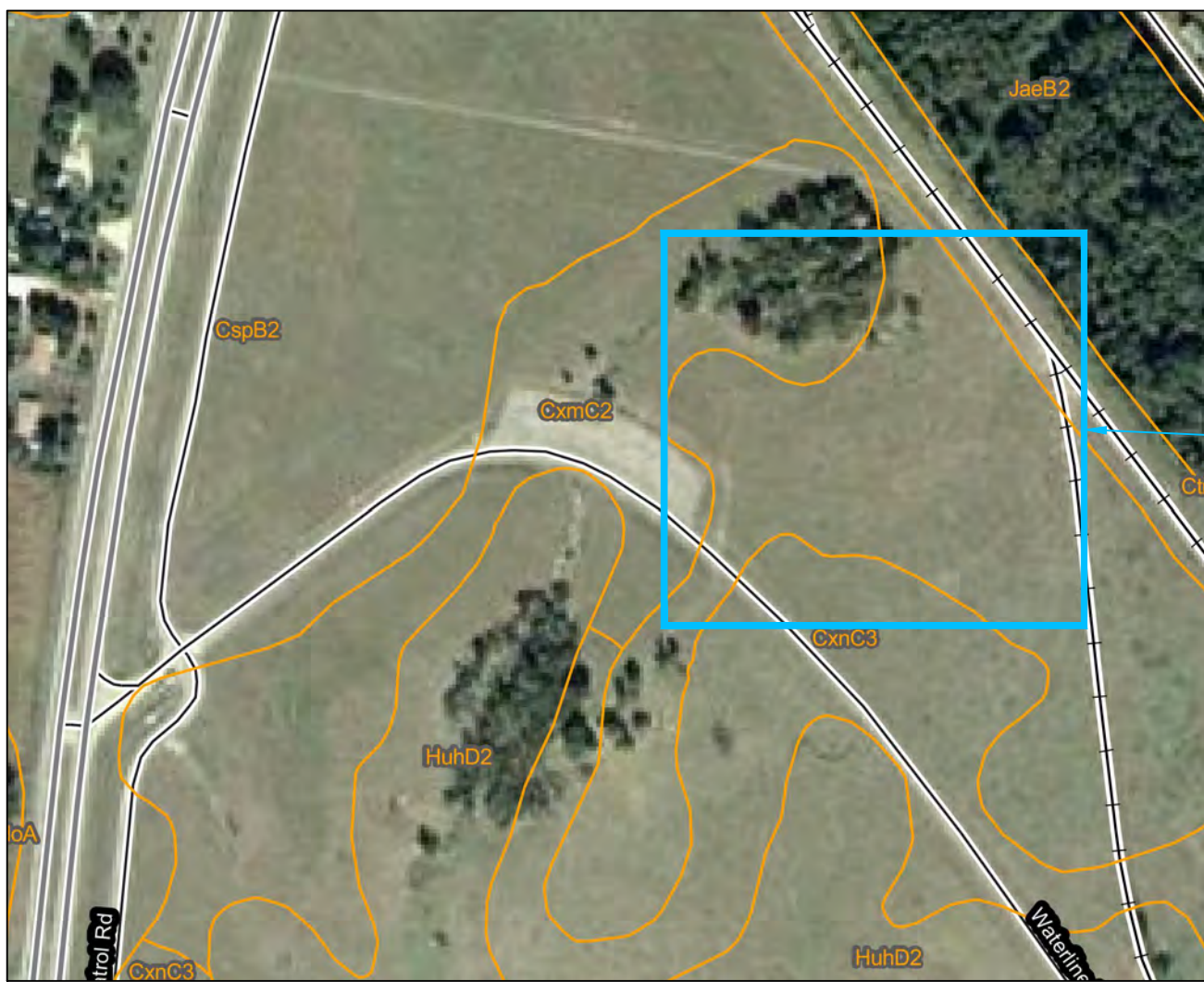
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CHARLESTOWN STATE PARK
WATER SUPPLY IMPROVEMENTS
DIVISION II—WELLS, WTP & BOOSTER STATION
WATER TREATMENT PLANT
STORMWATER POLLUTION PREVENTION PLAN
DATE: 11-05-09 APPROVED BY: DRAWN NUMBER: 7 OF 36

**BOOSTER STATION SITE
SUMMARY OF SOIL TYPES**

BdoA	Bedford silt loam, 0 to 2 percent slopes
CspB2	Crider silt loam, 2 to 6 percent slopes
CtrB2	Crider silt loam, karst, undulating, eroded
CxmC2	Crider-Haggat silt loams, karst, rolling, eroded
CxmC3	Crider-Haggat complex, karst, rolling, severely eroded
HuhD2	Haggatt-Caneyville silt loams, karst, hilly, eroded
JaeB2	Jennings silt loam, 2 to 6 percent slopes, eroded
HtzD3	Urban land-Udarents, clayey substratum, complex, hills, 2 to 10 percent slopes

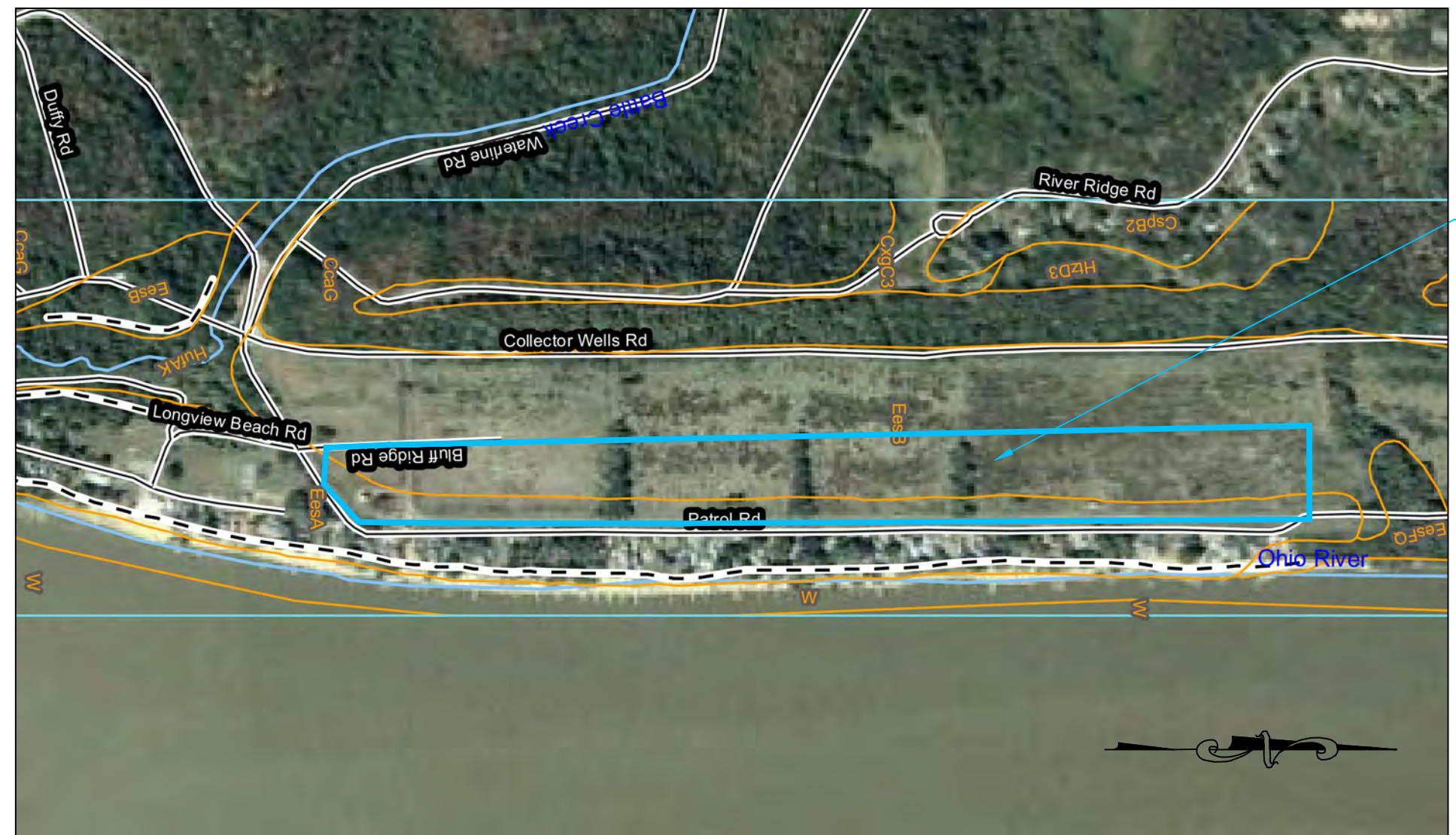


BOOSTER STATION PROJECT AREA

SOIL SURVEY MAP

**WATER TREATMENT PLANT SITE
SUMMARY OF SOIL TYPES**

CcaG	Caneyville-Rock outcrop complex, 25 to 60 percent slopes
CspB2	Crider silt loam, 2 to 6 percent slopes
CxgC3	Crider-Haggat complex, 6 to 12 percent slopes, severely eroded
CxhC2	Crider-Haggat complex, 6 to 12 percent slopes, eroded
EesA	Elikinsville-Millstone silt loams, 0 to 2 percent slopes
EesB	Elikinsville-Millstone silt loams, 2 to 6 percent slopes
EesFQ	Elikinsville-Millstone silt loams, 18 to 40 percent slopes, rarely flooded
HtzD3	Haggatt-Caneyville complex, 12 to 25 percent slopes, severely eroded
HufAK	Huntington silt loam, 0 to 2 percent slopes, occasionally flooded, brief duration



WATER TREATMENT PLANT AND WELLS PROJECT AREA

SOIL SURVEY MAP

ASSESSMENT OF CONSTRUCTION PLAN ELEMENTS

- A1 INDEX SHOWING LOCATIONS OF REQUIRED PLAN ELEMENTS
SEE SHEETS 3,6,7,7A AND 26
- A2 11" X 17" PLAT
NOT PRACTICAL TO PROVIDE FOR THIS PROJECT
- A3 NATURE AND PURPOSE OF PROJECT
BOOSTER STATION SITE: CONSTRUCTION OF A NEW WATER PRESSURE BOOSTER STATION
WATER TREATMENT PLANT SITE: CONSTRUCTION OF A NEW IRON AND MANGANESE REMOVAL PLANT, INSTALLATION OF PUMPING EQUIPMENT FOR THREE WATER WELLS
- A4 PROJECT SITE VICINITY MAP
SEE PLAN SHEET 2
- A5 LEGAL DESCRIPTION OF PROJECT SITE
NOT PRACTICAL TO PROVIDE FOR THIS PROJECT.
- A6 LOCATION OF IMPROVEMENTS
SEE PLAN SHEETS 3,6,7, & 26
- A7 HYDROLOGIC UNIT CODE
WATER TREATMENT PLANT SITE: 05140101080040
BOOSTER STATION SITE: 05140101100010
- A8 STATE OR FEDERAL WATER QUALITY PERMITS
NONE REQUIRED
- A9 STORMWATER DISCHARGE POINTS
EXISTING DRAINAGE PATTERNS AND DISCHARGE POINTS SHALL BE MAINTAINED AFTER THE PROPOSED CONSTRUCTION
- A10 WETLANDS, LAKES AND WATER COURSES ADJACENT TO SITE
WATER TREATMENT PLANT SITE: THE OHIO RIVER IS APPROXIMATELY 275' EAST OF EASTERN BOUNDARY OF THE SITE.
BOOSTER STATION SITE: AN UNNAMED WATERCOURSE FLOWS SOUTHWEST FROM THE SITE TO AN EXISTING NATURAL POND
- A11 IDENTIFICATION OF ALL RECEIVING WATERS:
OHIO RIVER
- A12 IDENTIFICATION OF POTENTIAL DISCHARGES TO GROUNDWATER
EXCAVATION DEPTH 10' MAXIMUM FOR WATER LINE CONSTRUCTION
- A13 100 YEAR FLOODPLAIN, FLOODWAY & FLOODWAY FRINGE
WATER TREATMENT PLANT SITE: SEE SHEET 7
BOOSTER STATION SITE: NO FLOODPLAIN, FLOODWAY OR FLOODWAY FRINGE IS ON OR ADJACENT TO THE SITE
- A14 PRE AND POST CONSTRUCTION 10 YEAR PEAK RUNOFF
PRE CONSTRUCTION RUNOFF= 0.10 cfs
ESTIMATED POST CONSTRUCTION RUNOFF=0.46 cfs
- A15 ADJACENT LAND USE
WATER TREATMENT PLANT: ADJACENT LAND USE FOR THE PROJECT AREA INCLUDES ROAD RIGHT-OF-WAY, MOWED YARDS & UNIMPROVED AREAS
BOOSTER STATION SITE: ADJACENT LAND USE FOR THE PROJECT AREA INCLUDES ROAD RIGHT-OF-WAY, & UNIMPROVED AREAS
- A16 LOCATION AND BOUNDARIES OF ALL DISTURBED AREAS
CONSTRUCTION LIMITS ARE TYPICALLY WITHIN THE AREAS SHOWN ON THE PLANS AS ENCLOSED WITH SILT FENCE, ASIDE FROM AREAS TO BE USED FOR STAGING. SEE PLAN SHEETS 7 AND 26
- A17 EXISTING VEGETATIVE COVER
GRASS
- A18 SOILS INFORMATION PROVIDED THIS SHEET
- A19 PROPOSED STORMWATER SYSTEM
NONE
- A20 OFF-SITE CONSTRUCTION ACTIVITIES
WATER MAIN CONSTRUCTION UNDER SEPARATE DIVISION
- A21 LOCATION OF SOIL STOCKPILES
SEE SHEET 6 AND 26
- A22 EXISTING SITE TOPOGRAPHY
SEE SHEET 6 AND 26
- A23 PROPOSED FINAL TOPOGRAPHY
SEE SHEETS 6 AND 26

STORMWATER POLLUTION PREVENTION PLAN - SECTION B

- B1 POTENTIAL POLLUTANT SOURCES ASSOCIATED WITH CONSTRUCTION ACTIVITIES
1) FLUIDS TYPICALLY USED FOR CONSTRUCTION ACTIVITIES INCLUDING, BUT NOT LIMITED TO GASOLINE, DIESEL FUEL, OILS, ACIDS, PAINTS, ETC.; CONTRACTOR SHALL MAINTAIN MATERIAL SAFETY DATA SHEETS (MSDS) FOR FLUIDS UTILIZED DURING CONSTRUCTION WITH POTENTIAL FOR SPILLAGE. CONTRACTOR SHALL HAVE A SPILL PREVENTION AND RESPONSE PLAN FOR RAPID CLEANUP OF SPILLED MATERIAL. CONTRACTOR SHALL MAINTAIN EMERGENCY SPILL HANDLING MATERIALS ON SITE TO ABSORB AND DISPOSE OF FLUIDS. HAZMAT SHALL BE REQUIRED FOR ANY SIGNIFICANT SPILLAGE.
2) TRASH AND DEBRIS TYPICAL ASSOCIATED WITH CONSTRUCTION ACTIVITIES SHALL BE COLLECTED IN A SUITABLE CONTAINER FOR PROPER DISPOSAL.
3) CONCRETE: THE GENERAL CONTRACTOR SHALL PROVIDE A DESIGNATED WASHOUT AREA NEAR THE CONSTRUCTION AND LOCATED BEHIND EROSION CONTROL PRACTICES SUCH THAT NO WASHOUT FROM THE CONCRETE LEAVES THE CONSTRUCTION AREA. MORTAR: PACKAGED MATERIALS SHALL BE STORED OFF THE GROUND, COVERED AND DRY UNTIL USED. WATER FOR CONCRETE AND MORTAR SHALL BE SUITABLE FOR DRINKING.
4) DEBRIS, WASTE MATERIALS AND RUBBISH SHALL NOT BE ALLOWED TO ACCUMULATE AND SHALL BE PROPERLY DISPOSED.
5) MATERIALS SHALL NOT BE PLACED IN FLOW LINES OF SWALES NOR NEAR OUTFALLS THAT WOULD DISRUPT THE NATURAL FLOW OF SURFACE RUNOFF IN A RAINFALL EVENT. WHERE DEBRIS HAS BLOWN, WASHED, FLOWED OR BEEN PLACED INTO DRAINAGE WAYS AS A RESULT OF THE CONTRACTOR'S OPERATION, SUCH MATERIAL OR DEBRIS SHALL BE ENTIRELY REMOVED AND LEGALLY DISPOSED OF.
6) NO HAZARDOUS MATERIALS ARE TO BE IN THE CONSTRUCTION AREAS. FUEL FOR CONSTRUCTION EQUIPMENT SHALL BE STORED IN APPROVED CONTAINERS WITH SECONDARY CONTAINMENT.
7) IDENTIFIED EROSION CONTROL PRACTICES SHALL BE USED TO MINIMIZE SEDIMENT, DEBRIS AND OIL RUNOFF TO PREVENT DISCHARGE INTO RECEIVING STREAMS.
- B2 SEQUENCE OF CONSTRUCTION
1) ESTABLISH CONSTRUCTION DRIVE AND STAGING AREA FOR EQUIPMENT AND MATERIALS.
2) ESTABLISH CONSTRUCTION ROUTE LIMITS IN THE FIELD
3) INSTALL PERIMETER EROSION CONTROL MEASURES & INLET PROTECTION WHERE NECESSARY AND MAINTAIN THROUGHOUT CONSTRUCTION.
4) PREPARE ROUTES FOR CONSTRUCTION, REMOVE TREES AND BRUSH AS REQUIRED.
5) INSTALL TEMPORARY EROSION CONTROL MEASURES OVER DISTURBED AREAS FROM WATER LINE CONSTRUCTION:
FLAT AREAS, SLOPE < 3H:1V - EMBED STRAW INTO SOIL
SLOPED AREAS 3H:1V AND STEEPER - EROSION CONTROL FABRIC WITH TEMPORARY SEEDING.
PAVED AREAS: INSTALL STONE BASE TO MAINTAIN VEHICLE ACCESS
6) INSTALL TEMPORARY EROSION CONTROL MEASURES AS NECESSARY FOR SEDIMENT CONTROL FOR ACTUAL FIELD CONDITIONS.
7) INSTALL PERMANENT EROSION CONTROL MEASURES, FINE GRADE, PERMANENT SEED AND MULCH, REINSTALL EROSION CONTROL BLANKET ON SLOPES > 3H:1V.
8) UTILITY TRENCHES SHALL BE BACKFILLED WITH COMPACTED GRANULAR BACKFILL OR FLOWABLE FILL IN LOCATIONS UNDER ROADS, DRIVEWAYS AND PARKING AREAS; TEMPORARY ROADWAY REPAIR SHALL BE #8 STONE.
9) REMOVE ALL EROSION CONTROL MEASURES UPON COMPLETION OF CONSTRUCTION AND SURFACE STABILIZATION. APPROVAL MUST BE GRANTED BY THE OWNER.

STORMWATER POLLUTION PREVENTION PLAN - SECTION B CONTINUED

- B3 CONSTRUCTION ENTRANCE LOCATIONS
1) CONSTRUCTION ENTRANCES - STONE ACCESS DRIVE SHALL BE CONSTRUCTED AT STAGING SITE. OTHER ACCESS IS THROUGH EXISTING ROADWAY & LOCATION IS TO BE DETERMINED IN FIELD.
2) CONTRACTOR SHALL SWEEP ROADS AS NECESSARY TO REMOVE SEDIMENT TRACKED ONTO ROADWAYS BY CONSTRUCTION TRAFFIC. WATERING OF ROADWAYS SHALL BE REQUIRED IF DUST CONTROL IS NECESSARY.
- B4 SEDIMENT CONTROL MEASURES FOR SHEET FLOW AREAS
1) STORMWATER RUNOFF SHEET FLOWS IN MOST OF THE PROPOSED WATER MAIN LOCATIONS; TEMPORARY STABILIZATION SHALL REQUIRE STRAW MULCH AND TEMPORARY SEEDING.
2) TRENCHES SHALL BE ALLOWED TO SETTLE A MINIMUM OF 30 DAYS FOLLOWING PIPE INSTALLATION. FINE GRADING SHALL FOLLOW WITH PREPARATION OF THE SEED BED. SEEDING AND MULCHING SHALL BE PERFORMED TO ESTABLISH PERMANENT GRASS VEGETATION IN SHEET FLOW AREAS.
- B5 SEDIMENT CONTROL MEASURES FOR CONCENTRATED FLOW AREAS
1) CONCENTRATED FLOW AREAS, SUCH AS DITCH CROSSINGS, SHALL BE STABILIZED WITH RIP-RAP FOR TEMPORARY AND PERMANENT SEDIMENT CONTROL.
- B6 STORM SEWER INLET PROTECTION MEASURES
1) NO EXISTING DRAINAGE INLETS ARE SHOWN ON THE TOPOGRAPHIC SURVEY.
2) CULVERTS SHALL BE PROTECTED WITH STRAW BALES WHERE APPROPRIATE.
- B7 RUNOFF CONTROL MEASURES (DIVERSIONS, SLOPE DRAINS, ETC.)
1) NO SPECIAL RUNOFF CONTROL MEASURES SHALL BE REQUIRED FOR THE PROPOSED CONSTRUCTION. SILT FENCING SHALL BE INSTALLED ON DOWN-SLOPE SIDE OF IMPROVEMENTS WHERE DISTURBED SOILS COULD BE TRANSPORTED DOWNSTREAM.
- B8 STORMWATER OUTLET PROTECTION
1) CONSTRUCTION OF A STORM OUTLET IS NOT INCLUDED IN THIS PROJECT
- B9 GRADE STABILIZATION STRUCTURES
NOT APPLICABLE
- B10 CONSTRUCTION DETAILS FOR STORMWATER MEASURES
SEE DETAILS THIS SHEET
- B11 TEMPORARY SURFACE STABILIZATION METHODS
1) TEMPORARY SEEDING SHALL UTILIZE SEED SPECIES, APPLICATION RATES AND DATES SET FORTH IN CHART ON THIS SHEET.
2) WATER LINE TRENCHES SHALL BE TEMPORARILY STABILIZED BY EMBEDDING (TRACKING) STRAW INTO SOIL. TRENCHES IN ROADS SHALL RECEIVE TEMPORARY REPAIR.
3) THE DURATION OF TIME SOIL REMAINS DISTURBED SHALL BE KEPT TO A PRACTICAL MINIMUM. THE AREA SHALL BE STABILIZED AS SOON AS POSSIBLE. TEMPORARY VEGETATION OR MULCHING SHALL BE USED TO PROTECT EXPOSED AREAS IF PERMANENT VEGETATION CANNOT BE SEEDING WITHIN 15 DAYS OR ACTIVITY CEASES FOR MORE THAN 15 DAYS OR AS DIRECTED BY THE ENGINEER.
4) PERMANENT AND FINAL VEGETATION SHALL BE INSTALLED WITHIN SEVEN (7) DAYS AFTER FINAL GRADING OR AS SOON AS POSSIBLE.

STORMWATER POLLUTION PREVENTION PLAN - POST CONSTRUCTION SECTION B

- B12 PERMANENT SURFACE STABILIZATION METHODS
1) FINAL GRADING SHALL BE PERFORMED IMMEDIATELY BEFORE FINAL VEGETATION. EROSION CONTROL ELEMENTS MAY BE REMOVED IF NECESSARY TO PERFORM FINAL GRADING AND VEGETATION. CONTRACTOR SHALL COORDINATE THE FINAL RESTORATION WORK WITH THE ENGINEER AND NOTIFY THE SWCD AGENT BEFORE PROCEEDING.
2) CONTRACTOR SHALL REMOVE ANY UNSUITABLE MATERIAL FROM THE PROJECT AREA EROSION CONTROL MEASURES.
3) ANY BARE DISTURBED AREAS WILL BE GRADED, SEEDING AND MULCHED OR OTHERWISE REVEGETATED OR STABILIZED. PERMANENT SEEDING SHALL BE ACCORDING TO THE SEED SPECIES, RATES AND DATES SHOWN IN THE CHART ON THIS SHEET.
4) FINAL STABILIZATION WILL BE CONSIDERED ACHIEVED WHEN PERENNIAL VEGETATIVE COVER HAS A DENSITY OF 70% ON ALL UNPAVED AREAS OR AN EQUIVALENT PERMANENT STABILIZATION MEASURE HAS BEEN UTILIZED.
- B13 MATERIAL HANDLING AND SPILL PREVENTION PLAN
1) SEE SECTION B1
2) KEEP PRODUCTS IN ORIGINAL CONTAINERS UNLESS THEY ARE NOT RE-SEALABLE, THEN ORIGINAL LABEL AND MATERIAL SAFETY DATA SHEET BE RETAINED. LABEL ALL CONTAINERS TO IDENTIFY CONTENTS.
3) ALL CONSTRUCTION ACTIVITIES TO BE MONITORED AND MAINTAINED BY THE CONTRACTOR. AS EACH NEW SUBCONTRACTOR COMES ON-SITE, THE CONTRACTOR WILL CONDUCT AND DOCUMENT A MEETING TO ENSURE PROPER HANDLING, STORAGE AND DISPOSAL OF CONSTRUCTION SITE WASTES THAT SHOULD BE POSTED IN STORAGE AND USE AREAS. WORKERS SHOULD BE TRAINED IN THESE PRACTICES TO ENSURE THAT EVERYONE UNDERSTANDS THE EXPECTED PROCEDURES.
4) CLEAN UP SPILLS IMMEDIATELY. FOR HAZARDOUS MATERIALS FOLLOW CLEANUP INSTRUCTIONS ON THE PACKAGE. USE ADSORBENT MATERIAL SUCH AS SAWDUST OR KITTY LITTER TO CONTAIN THE SPILL. PROPER SAFETY MATERIALS SHOULD BE STORED ON SITE IN CASE OF ACCIDENT OR SPILL. MATERIALS SHOULD INCLUDE BUT ARE NOT LIMITED TO BROOMS, DUST PANS, MOPS, RAGS, GLOVES, GOGGLES AND PLASTIC AND METAL TRASH CONTAINERS SPECIFICALLY FOR THAT PURPOSE.
5) IN AN EMERGENCY THE CONTRACTOR SHALL CALL 911. IN THE EVENT THAT THE SPILL POSES NO IMMEDIATE THREAT, THE CONTRACTOR SHALL CONTACT THE LOCAL FIRE DEPARTMENT AND IDEM EMERGENCY RESPONSE AT (888) 233-7745 WITHIN 24 HOURS OF THE SPILL. EMERGENCY PHONE NUMBERS AND PROCEDURES SHALL BE MAINTAINED BY THE PROJECT SUPERINTENDENT AND WITH EACH WORK CREW AND AT STAGING AND REFUELING AREAS.
- B14 MONITORING AND MAINTENANCE GUIDELINES
1) EROSION CONTROL MEASURES SHALL BE MONITORED ON A CONTINUAL BASIS. CONTRACTOR SHALL FILE A WRITTEN REPORT OF INSPECTION REGARDING THE STATUS OF SOIL EROSION CONTROL PRACTICES BY A REPRESENTATIVE EXPERIENCED IN EROSION CONTROL MEASURES ON A WEEKLY BASIS AND AGAIN WITHIN 24 HOURS OF EVERY 1/2 INCH RAIN EVENT. A COPY OF REPORT SHALL BE PROVIDED TO THE OWNER
2) SHOULD ANY INSPECTION SHOW ANY EROSION CONTROL MEASURE(S) TO BE IN A CONDITION WHICH WOULD PREVENT ITS PROPER FUNCTIONING, SUCH MEASURE(S) SHALL BE PROMPTLY RESTORED TO A FUNCTIONAL STATUS BY THE CONTRACTOR. REMOVAL OF SEDIMENT, ADDITION OF NEW ROCK OR GRAVEL, REPLACEMENT OF SILT FENCING, STRAW, OR EROSION CONTROL BLANKET SHALL BE PROVIDED AS NEEDED TO RESTORE ANY AND ALL EROSION CONTROL MEASURES.
3) CONTRACTOR SHALL SWEEP AND WATER ROADWAYS IMPACTED BY CONSTRUCTION AND CONSTRUCTION TRAFFIC AS REQUIRED TO PREVENT DUST PROBLEMS AND SEDIMENT TRANSPORT
- B15 EROSION & SEDIMENT CONTROL FOR INDIVIDUAL BLDG. LOTS
NOT APPLICABLE TO THIS PROJECT

STORMWATER POLLUTION PREVENTION PLAN - POST CONSTRUCTION SECTION C

- C1 DESCRIPTION OF POLLUTANTS AND SOURCES
1) THERE SHALL BE NO CHANGE TO THE LANDUSE ALONG THE PROJECT ROUTES WHICH ARE IN ROAD RIGHT-OF-WAYS OR UTILITY EASEMENTS. THE PROPOSED STAGING SITE SHALL BE COMPLETELY RESTORED TO PRE-EXISTING CONDITIONS FOLLOWING THE COMPLETION OF CONSTRUCTION.
2) POSSIBLE POLLUTANTS RESULTING FROM NORMAL USE AND MAINTENANCE TRAFFIC INCLUDE OIL, GREASE, ANTIFREEZE, BRAKE FLUID, BRAKE DUST, RUBBER FRAGMENTS, GASOLINE, DIESEL FUEL AND OTHER HYDROCARBONS, AND METALS FROM VEHICULAR AND OTHER SOURCES, GRIT AND TRASH. FERTILIZERS AND HERBICIDES MAY BE USED ON THE GRASS AND AGRICULTURAL VEGETATION (BY OTHERS).
3) ADJACENT LAND USES INCLUDE ROADWAYS RESIDENTIAL BUILDINGS AND UNIMPROVED AREAS. POLLUTANTS FROM THESE USES COULD INCLUDE, LAWN FERTILIZERS, INSECTICIDES AND HERBICIDES, LITTER, DEBRIS, AND OTHER MATERIALS AND FLUIDS ASSOCIATED WITH VEHICULAR TRAFFIC. SINCE THESE TYPES OF POLLUTANTS ARE BEYOND THE CONTRACTOR'S OR OWNER'S CONTROL, VERY LITTLE CAN BE DONE TO MINIMIZE OR CONTROL THE APPLICATION OR PRODUCTION OF SUCH.
- C2 POST CONSTRUCTION STORMWATER QUALITY IMPLEMENTATION
1) PROJECT AREAS SHALL BE MONITORED TO INSURE VEGETATIVE STABILIZATION IS MAINTAINED. CONTRACTOR SHALL RE-SEED AS NECESSARY IN ORDER TO ESTABLISH PERMANENT VEGETATION.
2) REMOVE TEMPORARY EROSION CONTROL MEASURES FOLLOWING ESTABLISHMENT OF VEGETATIVE STABILIZATION ON APPLICABLE DISTURBED AREAS.
- C3 DESCRIPTION OF STORMWATER QUALITY CONTROL MEASURES
1) GRASS VEGETATIVE STABILIZATION OVER DISTURBED PROJECT AREAS SHALL SERVE AS A FILTER FOR SEDIMENT AND POLLUTANTS CONVEYED BY SURFACE WATER RUNOFF.
2) MAINTENANCE OF THE PERMANENT EROSION CONTROL METHODS SHALL BE AS FOLLOWS:
A) MAINTAIN GRASS VEGETATION AT DISTURBED AREAS.
B) SWEEP STREETS TO REMOVE SEDIMENT ACCUMULATION
- C4 POST CONSTRUCTION STORMWATER QUALITY DETAILS
THE GRASS VEGETATION OVER DISTURBED AREAS SHALL SERVE AS THE PRIMARY STORMWATER QUALITY MEASURE. SPECIFICATIONS FOR PLANTING ARE PROVIDED ON THIS SHEET. EROSION CONTROL DETAILS ARE PROVIDED ON THIS SHEET.
- C5 POST-CONSTRUCTION MAINTENANCE GUIDELINES FOR STORMWATER QUALITY MEASURES
1) THE CONTRACTOR SHALL BE RESPONSIBLE FOR POST-CONSTRUCTION MAINTENANCE OF SILT FENCE AND OTHER EROSION CONTROL MEASURES, AND FOR CLEAN UP OF POLLUTANTS CAUSED BY CONSTRUCTION ACTIVITIES UNTIL ALL AREAS HAVE BEEN PROPERLY STABILIZED.
2) EROSION CONTROL MEASURES SHALL NOT BE REMOVED UNTIL VEGETATIVE STABILIZATION IS ESTABLISHED OVER ENTIRE SITE, AND ONLY UPON APPROVAL FROM ENGINEER AND OWNER.
3) WATER MAIN CONSTRUCTION SHOULD HAVE NO IMPACT ON STORMWATER QUALITY FOLLOWING REVEGETATION OF ALL DISTURBED AREAS.

TEMPORARY SEEDING DATES

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
Wheat or Rye												
Oats												
Annual Rye grass												

PERMANENT SEEDING DATES

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
Non-irrigated*												
Irrigated												
Dormant Seeding												

▣ Irrigation needed during this period. To control erosion at times other than in the shaded areas, use mulch.

• Late summer seeding dates may be extended 5 days if mulch is applied.
• Increase seeding application by 50%. (Dormant Season Nov. 15 - March1)

PERMANENT SEEDING CHART

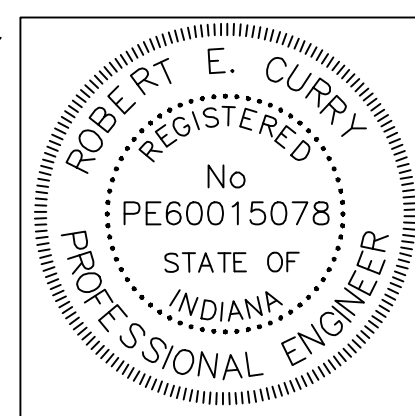
SPECIES	SEEDING RATE #/ACRE	SEEDING RATE #/1,000 SF
1. PERENNIAL RYEGRASS + WHITE OR LADINO CLOVER	35	0.8
2. KENTUCKY BLUEGRASS + CREEPING RED FESCUE	15	0.4
3. SMOOTH BROOMGRASS + RED CLOVER	30	0.8
CONCENTRATED FLOW AREAS		
4. PERENNIAL RYEGRASS + WHITE OR LADINO CLOVER	100	2.5
	1-2	0.05

TEMPORARY SEEDING CHART

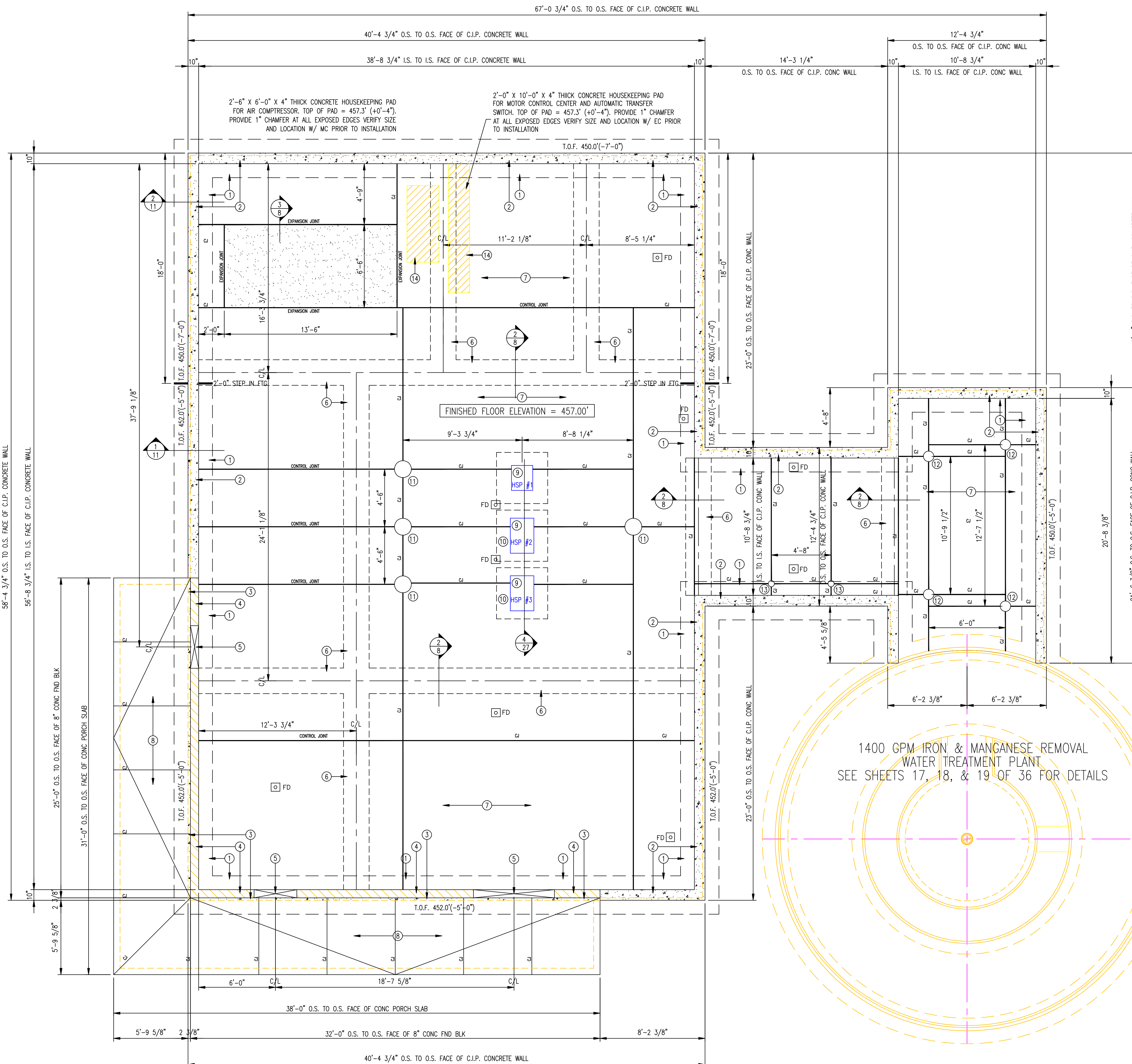
SPECIES	SEEDING RATE #/ACRE	SEEDING RATE #/1,000 SF
WHEAT OR RYE	2 BU	3.5 #
SPRING OATS	3 BU	2.3 #
ANNUAL RYE GRASS	40 #	1 #

SEE SPECIFICATION SECTION 02511 SURFACE RESTORATION FOR ADDITIONAL INFORMATION

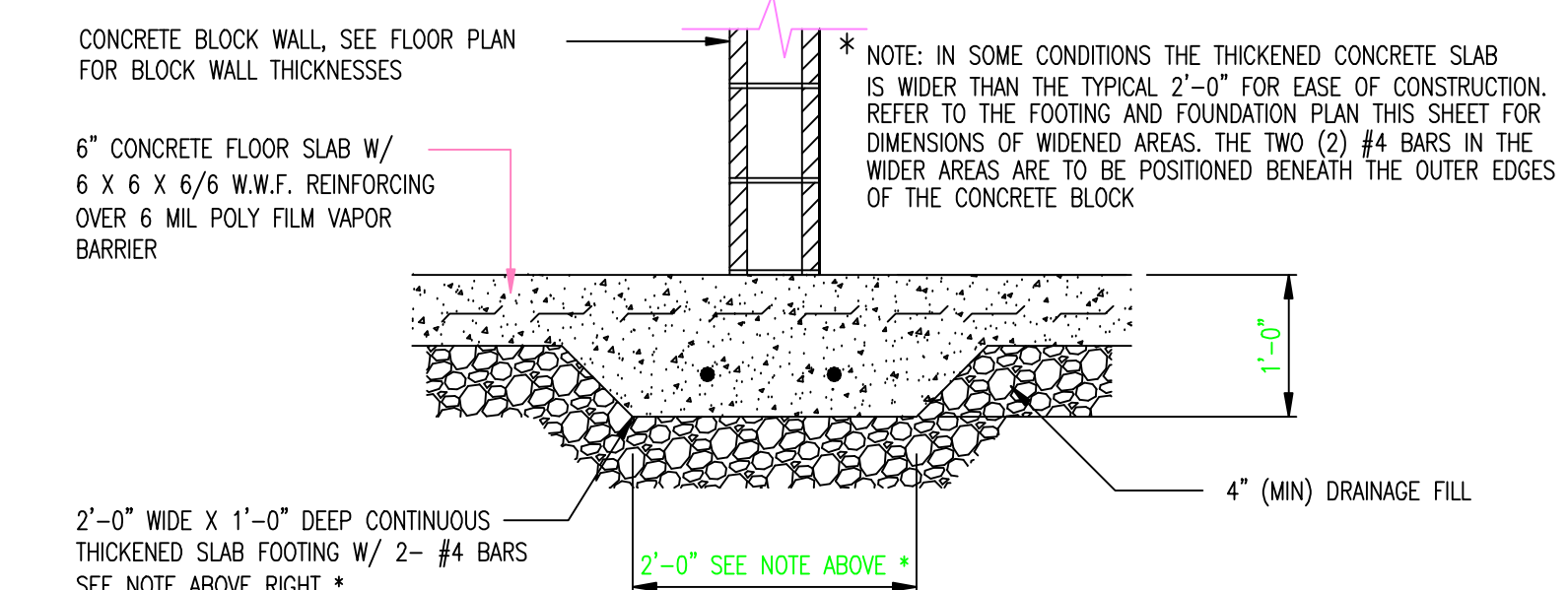
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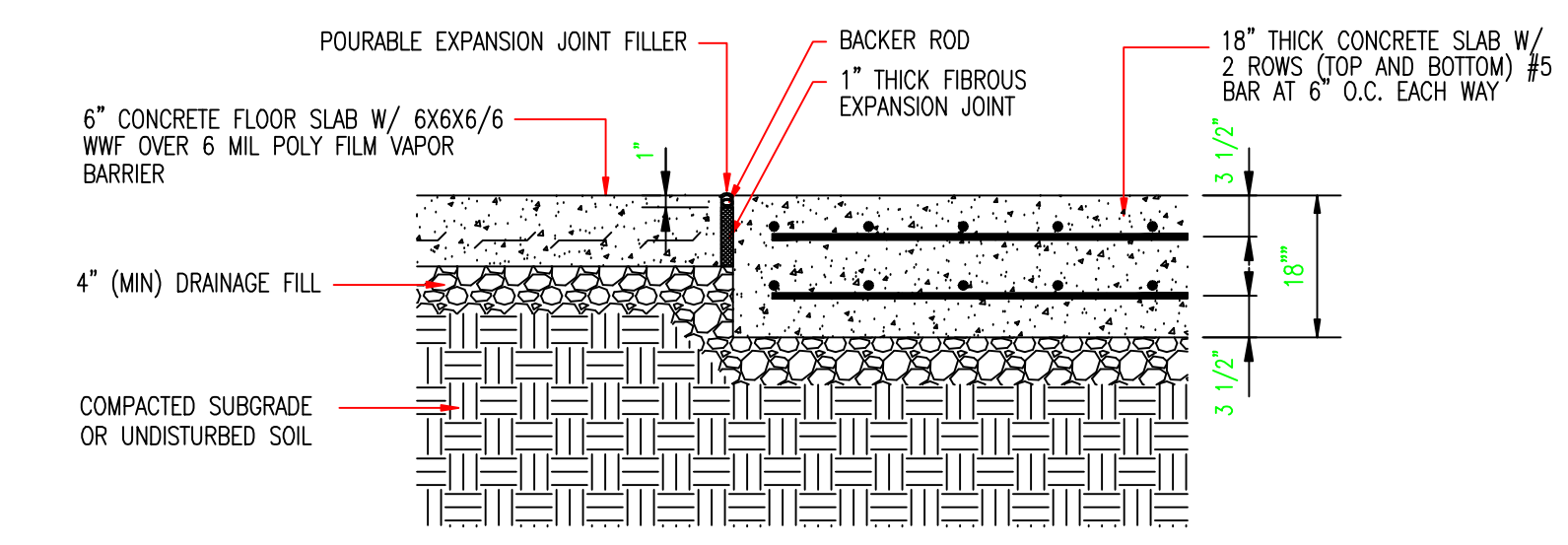
INDIANA DEPARTMENT OF NATURAL RESOURCES D.A.P.W. PROJECT NO. E030094		DRAWN BY:
CHARLESTOWN STATE PARK WATER SUPPLY IMPROVEMENTS DIVISION II—WELLS, WTP & BOOSTER STATION		REVISED:
WATER TREATMENT PLANT STORMWATER POLLUTION PREVENTION PLAN NOTES AND DETAILS		
DATE 11-05-09	APPROVED BY:	DRAWING NUMBER: 7A OF 36



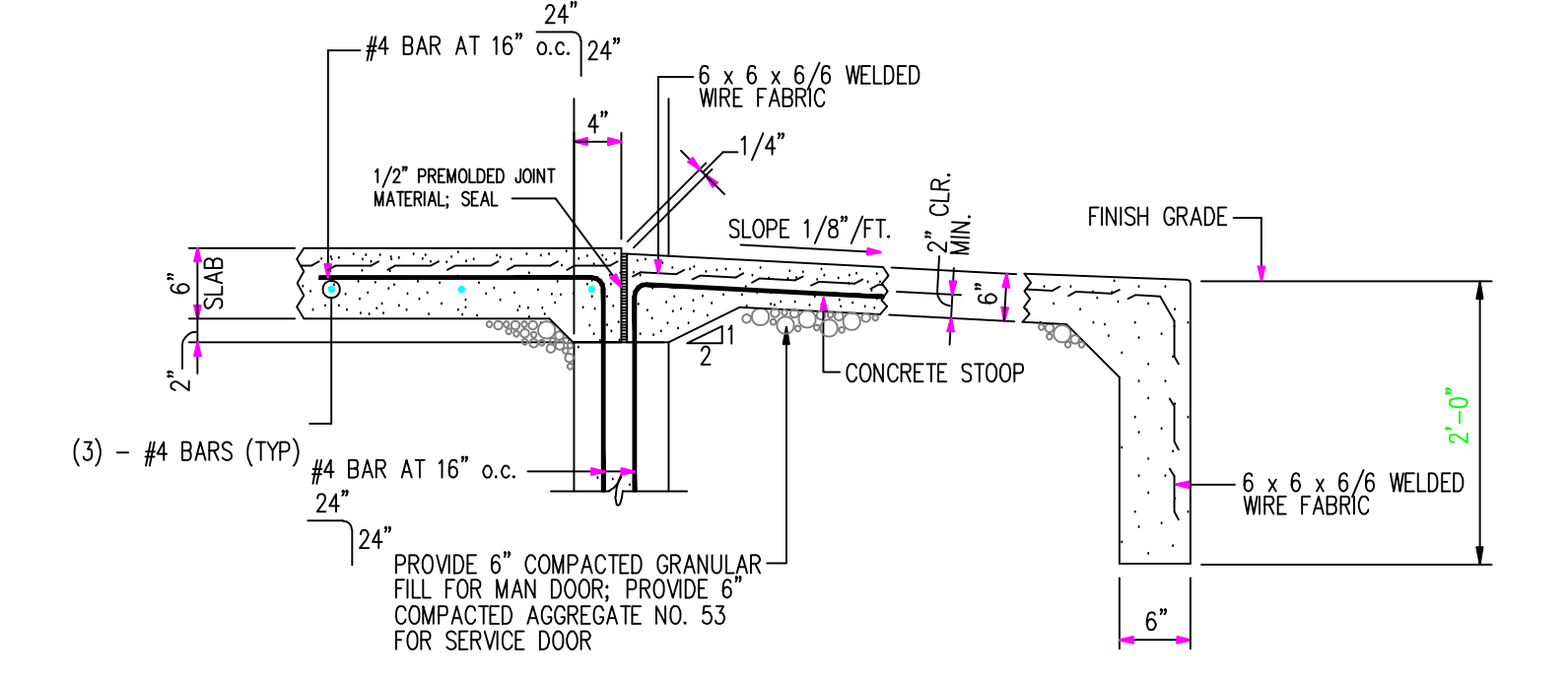
1 FOOTING AND FOUNDATION PLAN
8 SCALE 1/4" = 1'-0"



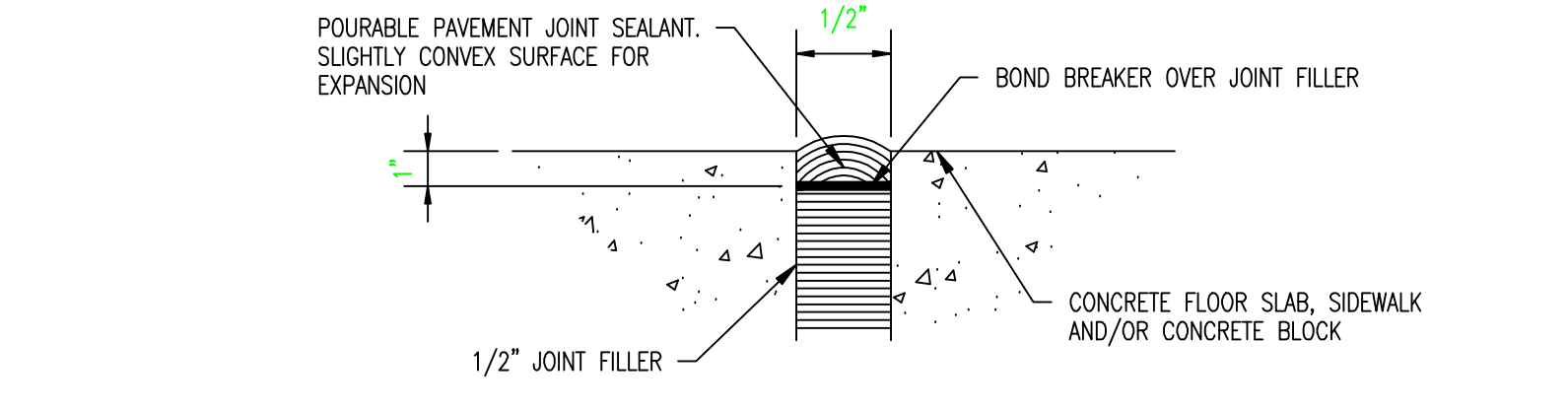
2 SECTION - THICKENED CONCRETE SLAB/FOOTING FOR INTERIOR CONCRETE BLOCK WALLS
8 SCALE 3/4" = 1'-0"



3 GENERATOR PAD DETAIL
8 SCALE 3/4" = 1'-0"



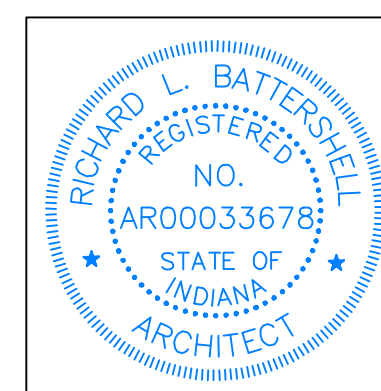
4 SECTION - CONCRETE WALK AT SERVICE DOOR OPENINGS
8 SCALE 3/4" = 1'-0"



5 EXPANSION/CONTRACTION JOINT SECTION DETAIL
8 NO SCALE

FOOTING AND FOUNDATION NOTES	
MARK	NOTE
1	3'-0" WIDE X 12" DEEP CONTINUOUS CONCRETE FOOTING W/ 3 - #4 BARS CONTINUOUS (TOP OF CONTINUOUS CONCRETE FOOTING ELEV. = 441.00')
2	10" WIDE X 5'-0" HIGH CAST-IN-PLACE CONT. CONCRETE FOUNDATION WALL W/ #4 VERT. DOWELS AT 24" O.C. BOTH FACES & #4 HORIZ. BARS AT 10" O.C. BOTH FACES. (TOP OF CAST-IN-PLACE FND WALL ELEV. = 457.00') UNLESS OTHERWISE NOTED
3	10" WIDE X 4'-4" HIGH CAST-IN-PLACE CONT. CONCRETE FOUNDATION WALL W/ #4 VERT. DOWELS AT 24" O.C. BOTH FACES & #4 HORIZ. BARS AT 10" O.C. BOTH FACES. (TOP OF CAST-IN-PLACE FND WALL ELEV. = 456.34') UNLESS OTHERWISE NOTED
4	1 COURSE 8" CONCRETE FOUNDATION BLOCK
5	OMIT 8" CONCRETE FOUNDATION BLOCK COURSE AT EXTERIOR MAN DOOR OPENING
6	12'-0" WIDE X 12" DEEP CONTINUOUS THICKENED SLAB FOOTING W/ 2-#4 BARS CONTINUOUS
7	6" THICK CONCRETE FLOOR SLAB W/ 6X6X6/6 W.W.F. OVER 6 MIL POLYFILM VAPOR BARRIER OVER COMPACTED GRANULAR FILL (FINISHED FLOOR ELEVATION = 457.00')
8	6" THICK CONCRETE CONCRETE FLOOR SLAB W/ 6X6X6/6 W.W.F. OVER COMPACTED GRANULAR FILL TURN DOWN EDGE 6" WIDE X 24" DEEP, SLOPE AWAY FROM BLD'G 1/8" PER FT
9	CONCRETE PUMP BASE, SEE DETAIL 4 ON SHT 27 AND CONCRETE PUMP BASE SCHEDULE FOR SIZES
10	4'-0" X 4'-0" X 12" DEEP THICKENED SLAB FOUNDATION AT CONCRETE PUMP BASE
11	16" PIPE PENETRATION THRU FLOOR
12	10" PIPE PENETRATION THRU FLOOR
13	6" PIPE PENETRATION THRU FLOOR
14	4" THICK HOUSEKEEPING PAD AT MOTOR CONTROL CENTER AND AIR COMPRESSOR. TOP OF PAD ELEVATION 457.33' (+0'-4") VERIFY DIMENSIONS WITH EC PRIOR TO INSTALLATION

IMPORTANT NOTE:
PIPING & EQUIPMENT SHOWN FOR REFERENCE ONLY.
SEE PIPING & EQUIPMENT PLANS FOR DIMENSIONS, LOCATIONS, ETC.



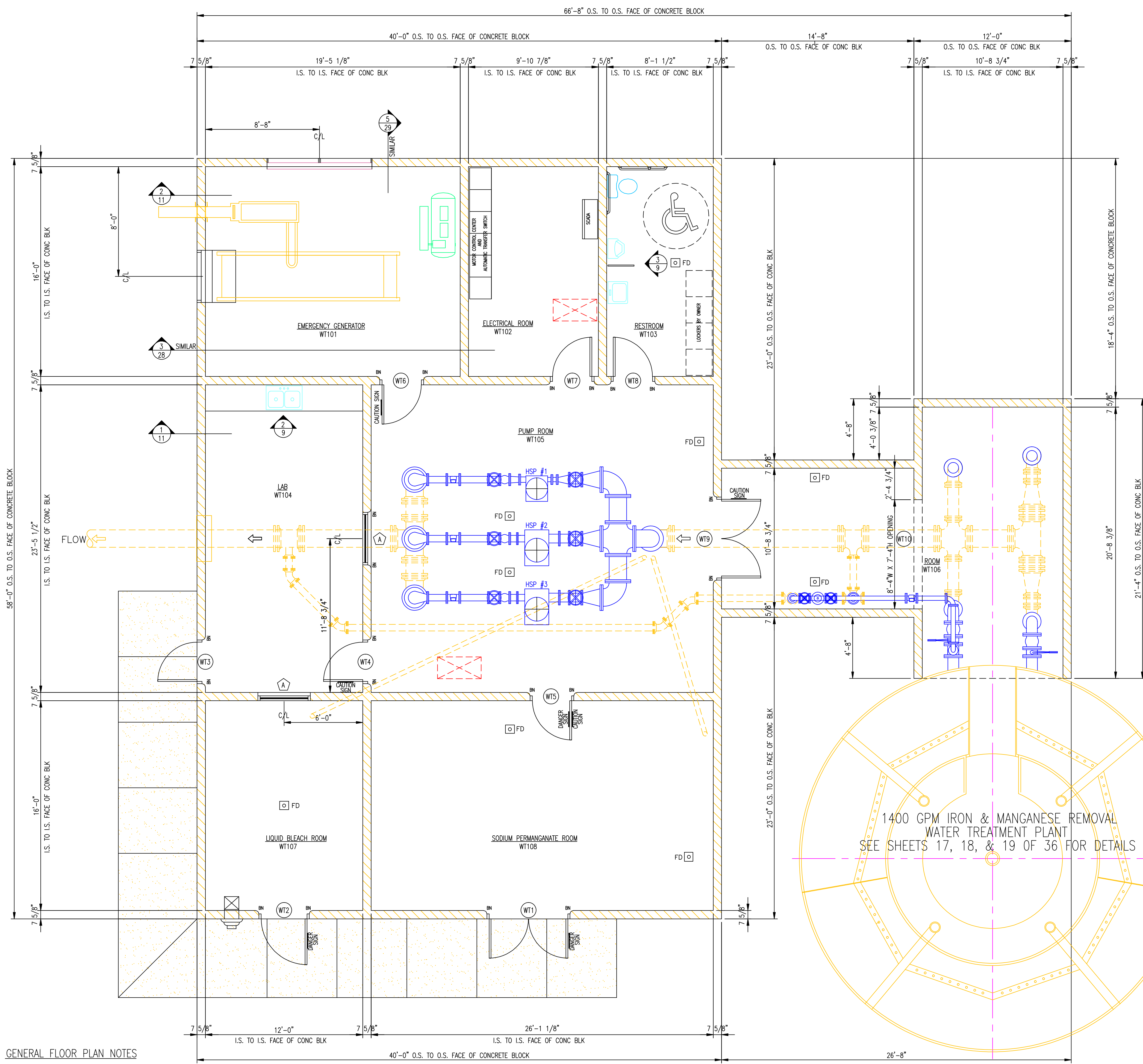
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INDIANA DEPARTMENT OF NATURAL RESOURCES
D.A.P.W. PROJECT NO. E030094

CHARLESTOWN STATE PARK
WATER SUPPLY IMPROVEMENTS
DIVISION II - WELLS, WTP & BOOSTER STATION

WATER TREATMENT PLANT FOOTING AND FOUNDATION PLAN

DATE: NOVEMBER 5, 2009 *Richard L. Battershell* DRAWING NUMBER: 8 OF 36

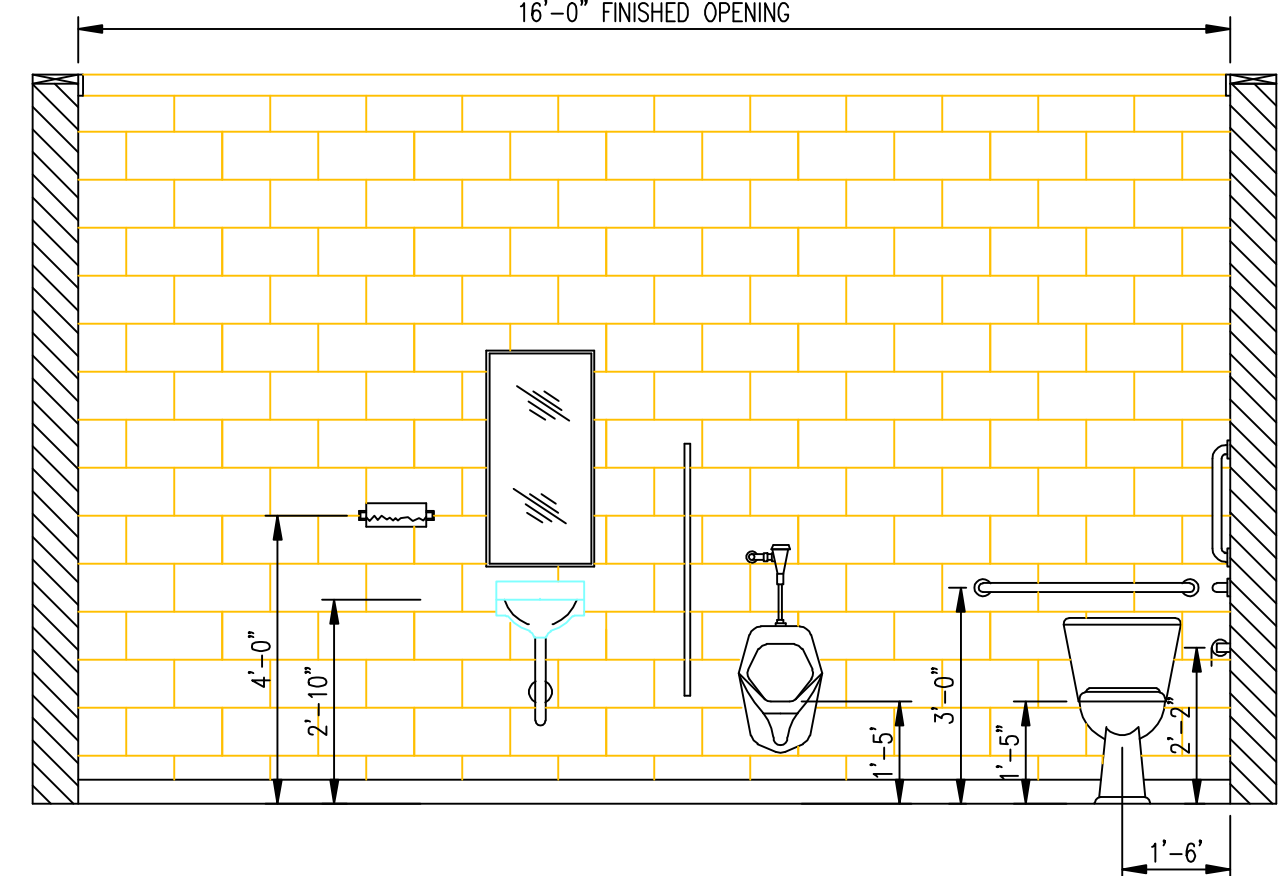


ROOM FINISH SCHEDULE										
ROOM NUMBER	ROOM NAME	FLOOR	BASE	WALLS				CEILING	CEILING HEIGHT	REMARKS
				NORTH	SOUTH	EAST	WEST			
WT101	EMERGENCY GENERATOR		4" COVED VINYL BASE	PAINTED CONCRETE BLOCK	PAINTED CONCRETE BLOCK	PAINTED CONCRETE BLOCK	PAINTED CONCRETE BLOCK	PLASTIC CEILING PANELS	VARIES	
WT102	ELECTRICAL ROOM		4" COVED VINYL BASE	PAINTED CONCRETE BLOCK	PAINTED CONCRETE BLOCK	PAINTED CONCRETE BLOCK	PAINTED CONCRETE BLOCK	PLASTIC CEILING PANELS	10'-1 1/2"	
WT103	RESTROOM		4" COVED VINYL BASE	PAINTED CONCRETE BLOCK	PAINTED CONCRETE BLOCK	PAINTED CONCRETE BLOCK	PAINTED CONCRETE BLOCK	PLASTIC CEILING PANELS	10'-1 1/2"	
WT104	LAB		4" COVED VINYL BASE	PAINTED CONCRETE BLOCK	PAINTED CONCRETE BLOCK	PAINTED CONCRETE BLOCK	PAINTED CONCRETE BLOCK	PLASTIC CEILING PANELS	10'-1 1/2"	
WT105	PUMP ROOM		4" COVED VINYL BASE	PAINTED CONCRETE BLOCK	PAINTED CONCRETE BLOCK	PAINTED CONCRETE BLOCK	PAINTED CONCRETE BLOCK	PLASTIC CEILING PANELS	10'-1 1/2"	
WT106	ROOM		4" COVED VINYL BASE	PAINTED CONCRETE BLOCK	PAINTED CONCRETE BLOCK	PAINTED CONCRETE BLOCK	PAINTED CONCRETE BLOCK	PLASTIC CEILING PANELS	10'-1 1/2"	
WT107	LIQUID BLEACH ROOM		4" COVED VINYL BASE	PAINTED CONCRETE BLOCK	PAINTED CONCRETE BLOCK	PAINTED CONCRETE BLOCK	PAINTED CONCRETE BLOCK	PLASTIC CEILING PANELS	10'-1 1/2"	
WT108	SODIUM PERMANGANATE RM		4" COVED VINYL BASE	PAINTED CONCRETE BLOCK	PAINTED CONCRETE BLOCK	PAINTED CONCRETE BLOCK	PAINTED CONCRETE BLOCK	PLASTIC CEILING PANELS	10'-1 1/2"	

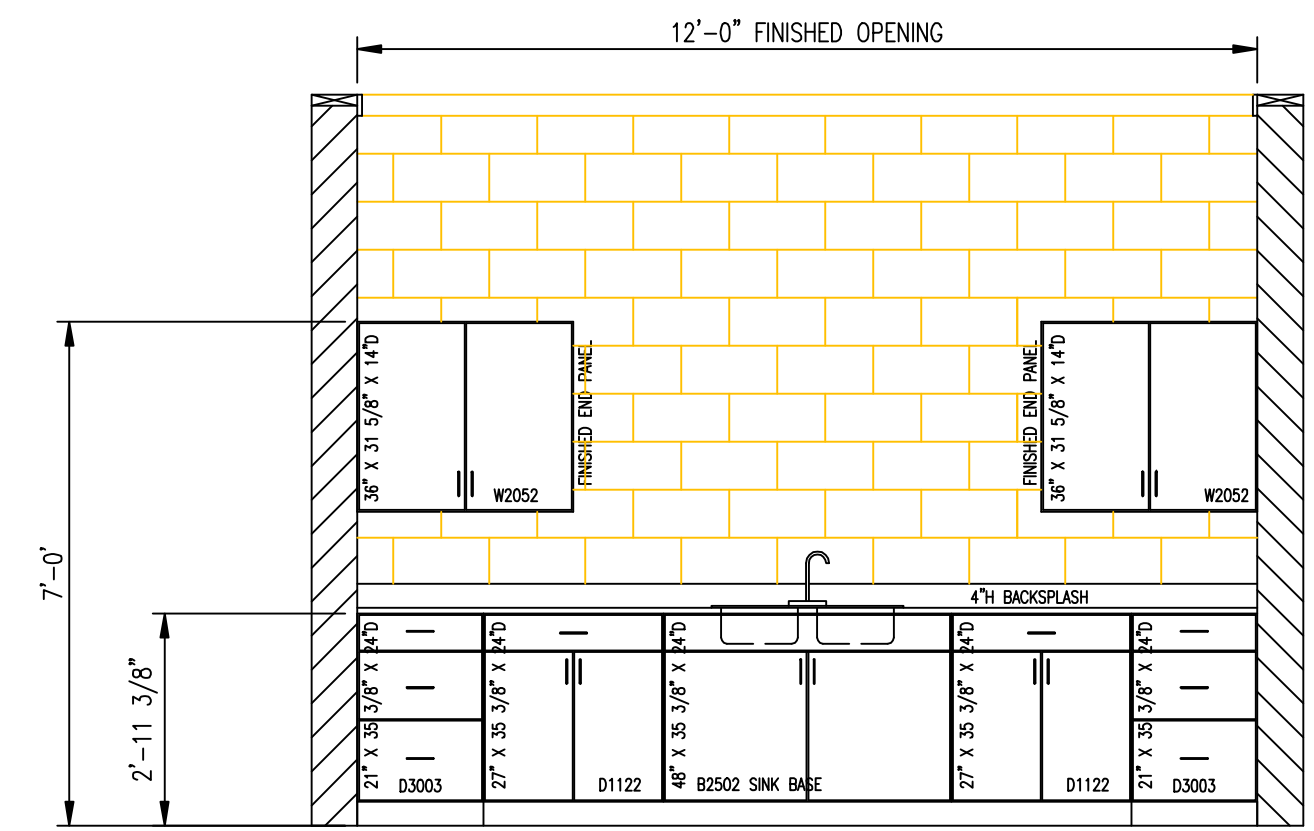
DOOR SCHEDULE							
MARK	DOOR SIZE	DOOR TYPE	FRAME SIZE	FRAME TYPE	HARDWARE SET	REMARKS	SIGNAGE TEXT
WT1	PAIR- 3'-0" X 7'-2" X 1 3/4"	INSULATED FIBERGLASS	5 3/4" X 2"	FIBERGLASS	SET #1		CAUTION HEARING PROTECTION REQUIRED THIS AREA
WT2	1- 3'-6" X 7'-2" X 1 3/4"	INSULATED FIBERGLASS	5 3/4" X 2"	FIBERGLASS	SET #2	PROVIDE 24" X 24" FIXED LOUVER W/ 24" X 24" GRAVITY SHUTTER. SEE 2-11	CAUTION HEARING PROTECTION REQUIRED THIS AREA
WT3	1- 3'-0" X 7'-2" X 1 3/4"	INSULATED FIBERGLASS	5 3/4" X 2"	FIBERGLASS	SET #3		CAUTION HEARING PROTECTION REQUIRED THIS AREA
WT4	1- 3'-0" X 7'-2" X 1 3/4"	INSULATED FIBERGLASS	5 3/4" X 2"	FIBERGLASS	SET #4		CAUTION HEARING PROTECTION REQUIRED THIS AREA
WT5	1- 3'-0" X 7'-2" X 1 3/4"	INSULATED FIBERGLASS	5 3/4" X 2"	FIBERGLASS	SET #4		CAUTION HEARING PROTECTION REQUIRED THIS AREA
WT6	1- 3'-0" X 7'-2" X 1 3/4"	INSULATED FIBERGLASS	5 3/4" X 2"	FIBERGLASS	SET #6		CAUTION HEARING PROTECTION REQUIRED THIS AREA
WT7	1- 3'-0" X 7'-2" X 1 3/4"	INSULATED FIBERGLASS	5 3/4" X 2"	FIBERGLASS	SET #4		CAUTION HEARING PROTECTION REQUIRED THIS AREA
WT8	1- 3'-0" X 7'-2" X 1 3/4"	INSULATED FIBERGLASS	5 3/4" X 2"	FIBERGLASS	SET #5		CAUTION HEARING PROTECTION REQUIRED THIS AREA
WT9	PAIR- 3'-0" X 7'-2" X 1 3/4"	INSULATED FIBERGLASS	5 3/4" X 2"	FIBERGLASS	SET #1		CAUTION HEARING PROTECTION REQUIRED THIS AREA
WT10	OPENING 8'-4" W X 7'-4" H						

SIGNAGE NOTES

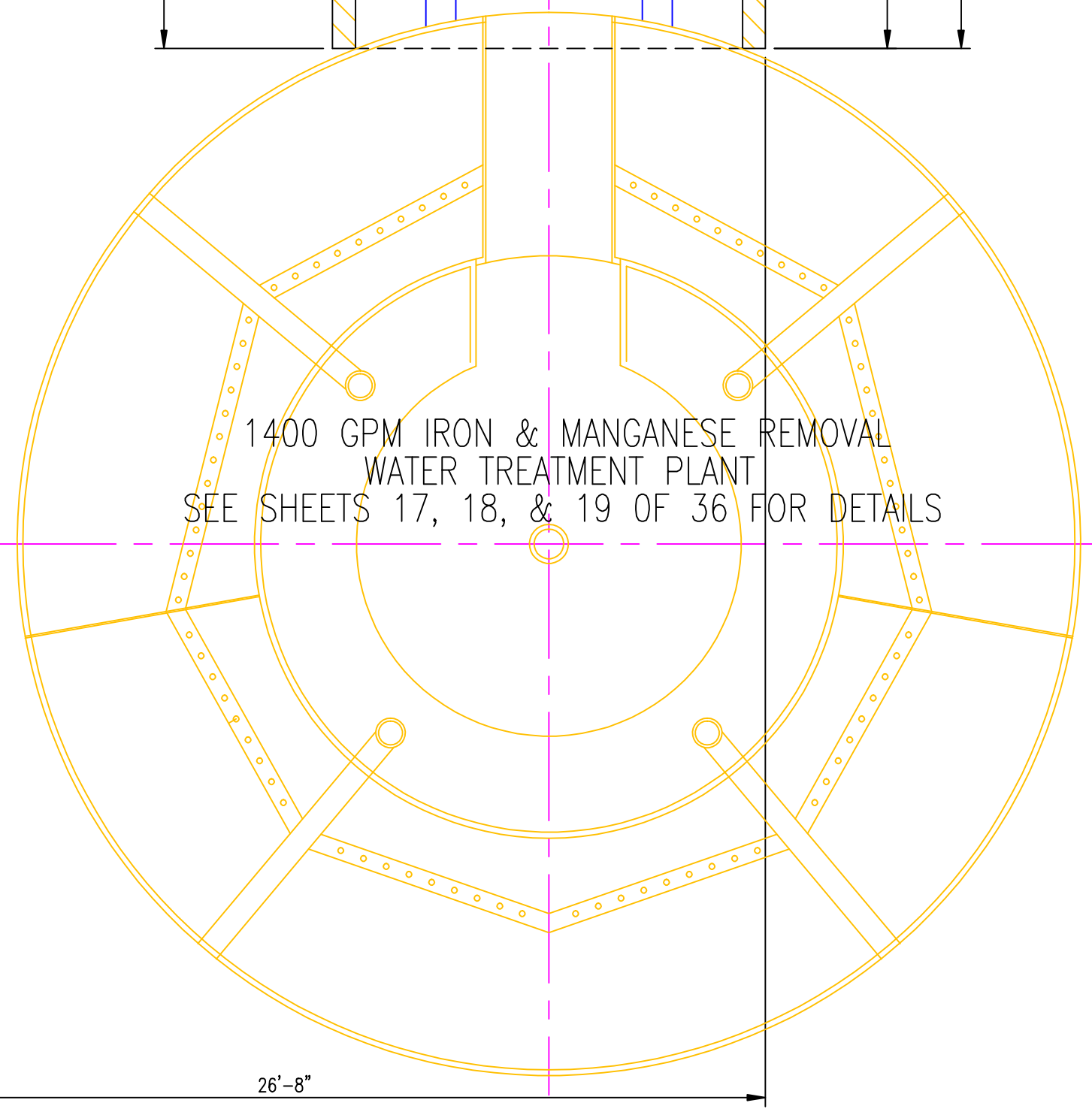
- ALL SIGNS SHALL BE 10" X 14" X 0 FIBERGLASS, UV RESISTANT, FACTORY EMBEDDED TEXT SIGNS SHALL CONFOI ANSI Z-535.2 1998 AND 29-CFR 19
- "CAUTION" SIGNS SHALL HAVE SAFETY BACKGROUND W/ BLACK TEXT AND SAFETY GRAPHIC
- "DANGER" SIGNS SHALL HAVE WHITE GROUND AND RED/BLACK TEXT AND SAFETY GRAPHIC



3 RESTROOM #103 ELEVATION
SCALE 3/8" = 1'-0"



2 CASEWORK ELEVATION WEST WALL OF LAB #104
SCALE 1/4" = 1'-0"

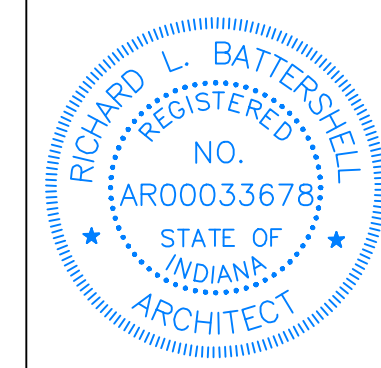


GENERAL FLOOR PLAN NOTES

- ALL DIMENSIONS SHALL BE TO THE FACE OF CONG. BLOCK, UNLESS OTHERWISE NOTED.
- ALL INTERIOR PARTITIONS SHALL BE 8" SMOOTH-FACE CONG. BLOCK UNLESS OTHERWISE NOTED.
- UNLESS OTHERWISE NOTED, ALL INTERIOR PARTITION WALLS SHALL BE BUILT TO THE BOTTOM OF THE CEILING JOISTS ABOVE.
- PIPING & EQUIPMENT SHOWN FOR REFERENCE ONLY. SEE PIPING & EQUIPMENT PLANS FOR DIMENSIONS, LOCATIONS, ETC.
- BN = BULL NOSED CONCRETE BLOCK AT DOOR / WINDOW JAMBS
- DO NOT SCALE DRAWINGS!

IMPORTANT NOTE:
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1 FLOOR PLAN
SCALE 1/4" = 1'-0"



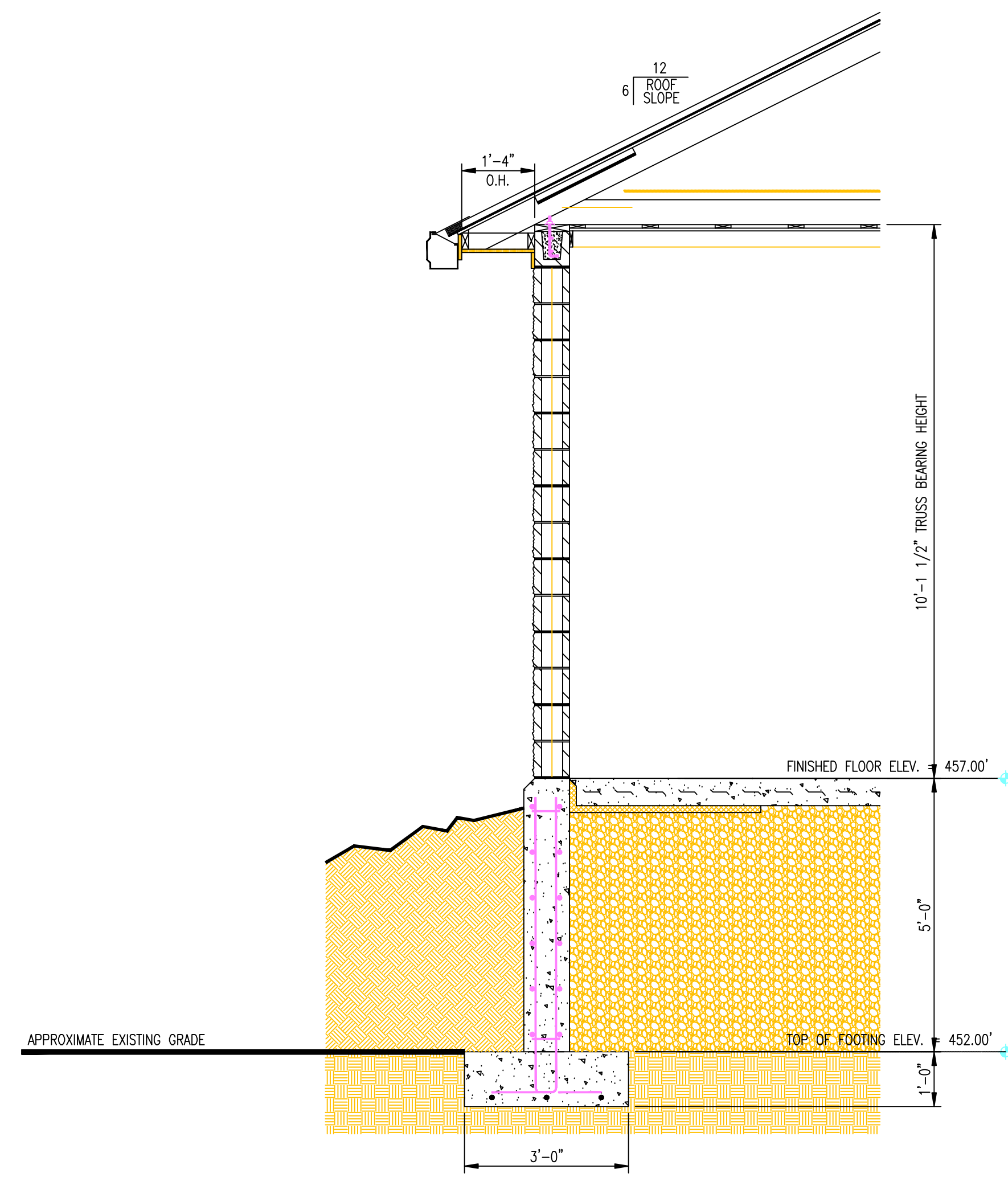
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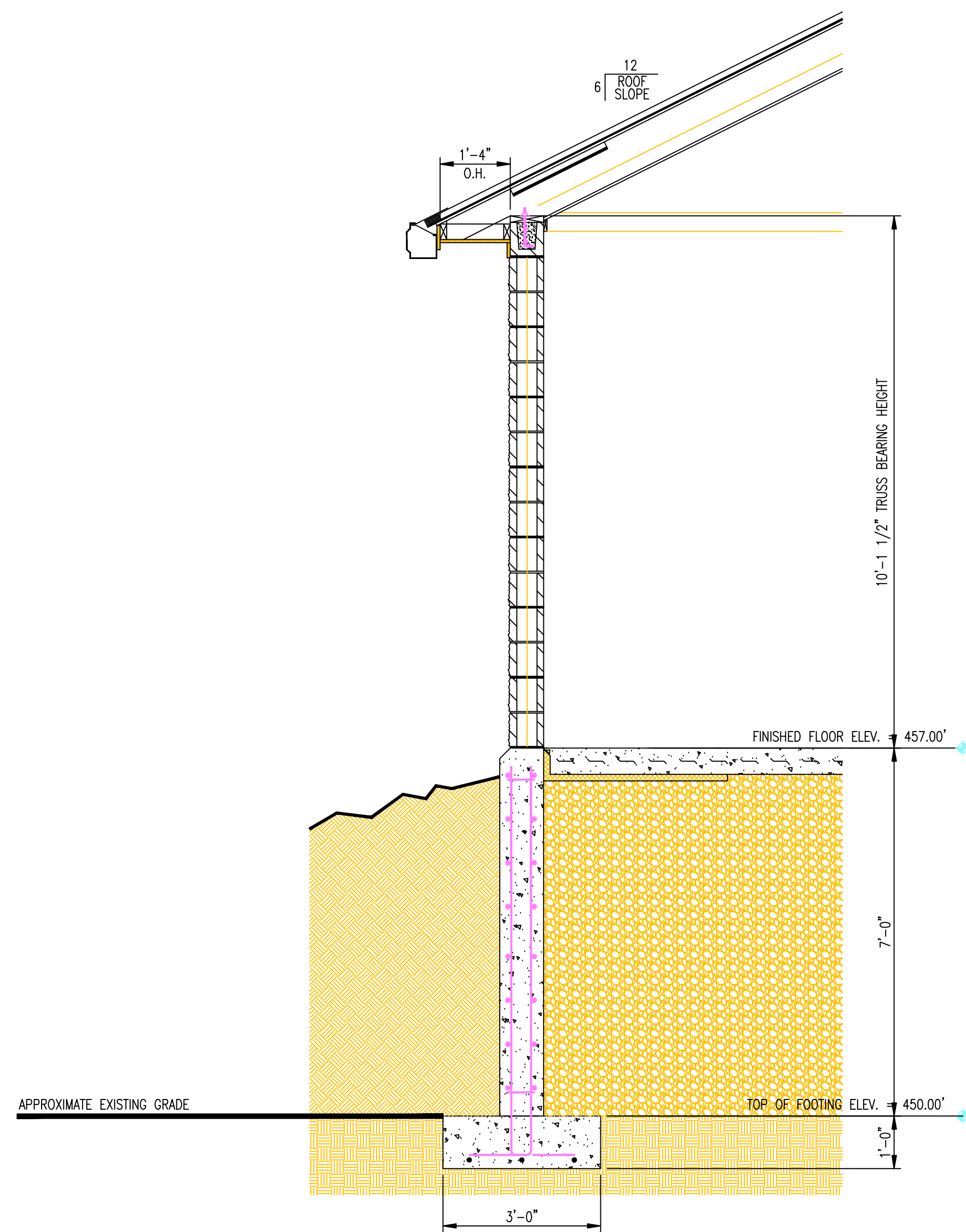
CHARLESTOWN STATE PARK
WATER SUPPLY IMPROVEMENTS
DIVISION II - WELLS, WTP & BOOSTER STATION

WATER TREATMENT PLANT FLOOR PLAN

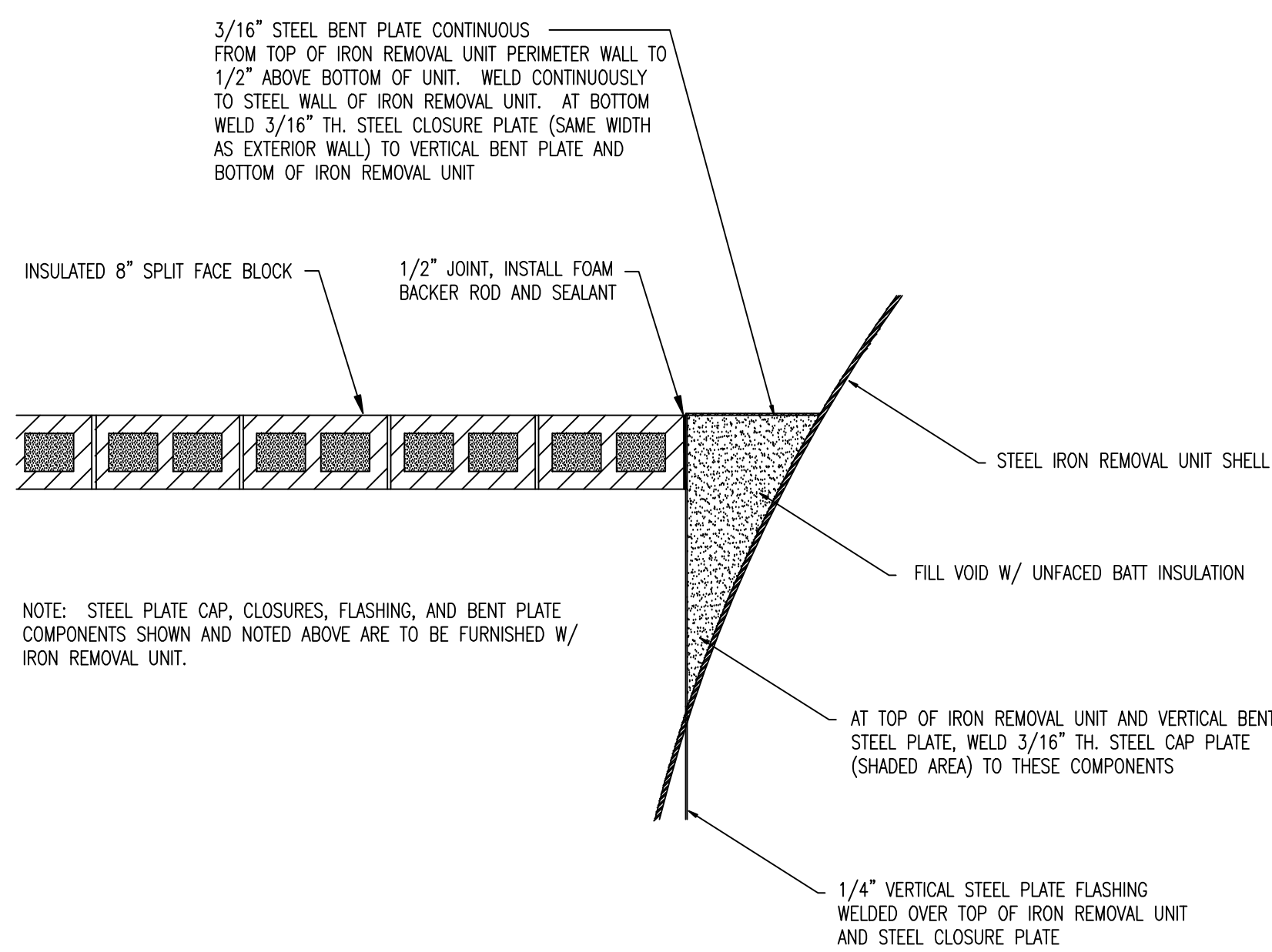
DATE: NOVEMBER 5, 2009
DRAWN BY: Richard L. Battershell
REVIEWED: [Signature]
DRAWING NUMBER: 9 OF 36



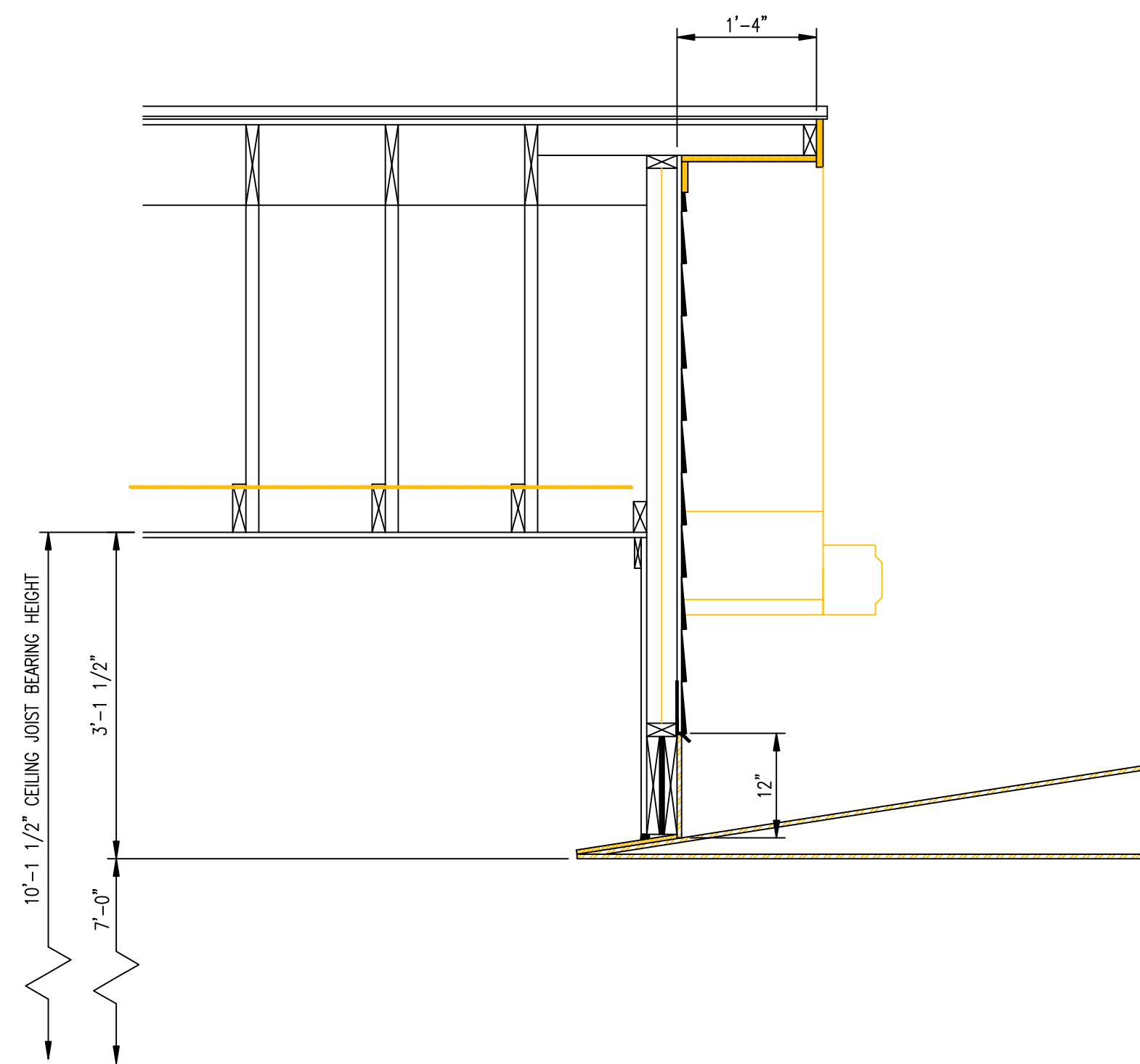
1 TYPICAL WATER TREATMENT PLANT WALL SECTION
11 SCALE 1/2" = 1'-0"



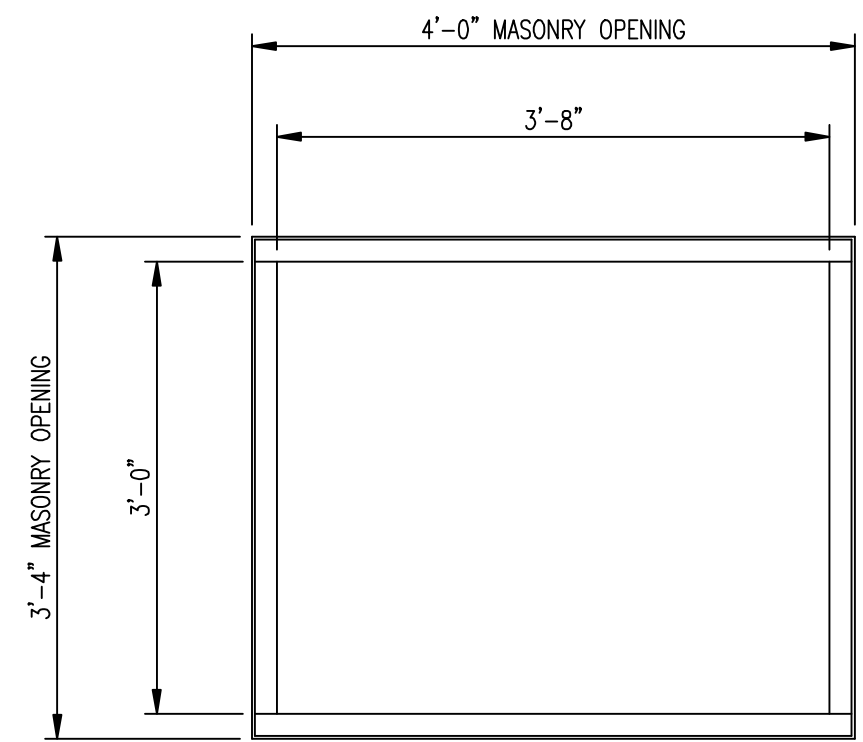
2 WALL SECTION AT WATER TREATMENT PLANT GENERATOR ROOM
11 SCALE 1/2" = 1'-0"



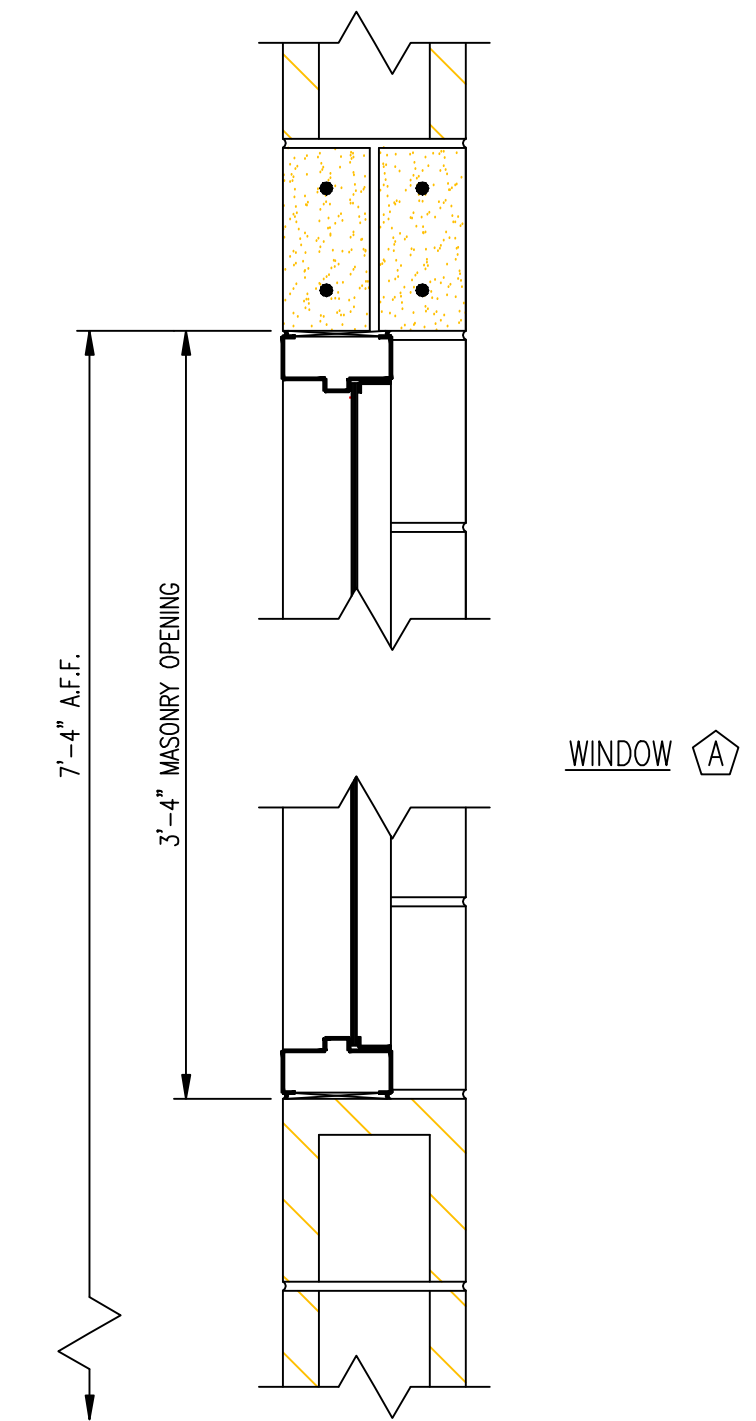
6 WALL CONNECTION TO IRON & MANGANESE REMOVAL PLAN DETAIL
11 SCALE 3/4" = 1'-0"



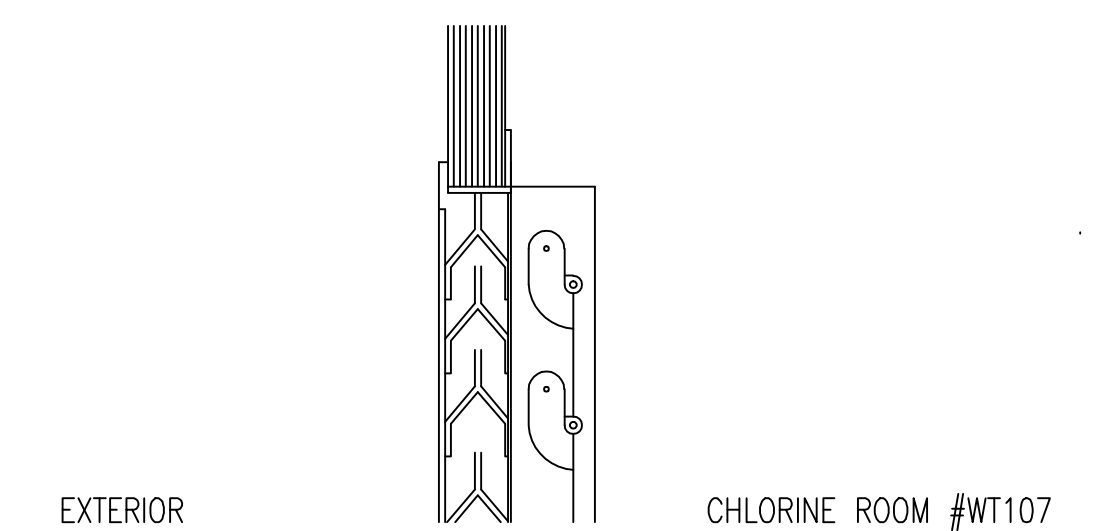
7 SECTION THRU ROOF AT 1400 GPM IRON & MANGANESE REMOVAL
11 SCALE 3/4" = 1'-0"



3 INTERIOR WINDOW 'A' ELEVATION
11 SCALE 3/4" = 1'-0"

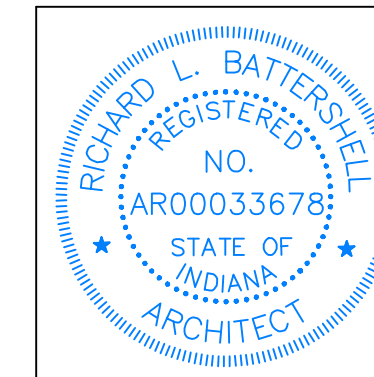


4 INTERIOR WINDOW 'A' SECTION DETAILS
11 SCALE 1 1/2" = 1'-0"

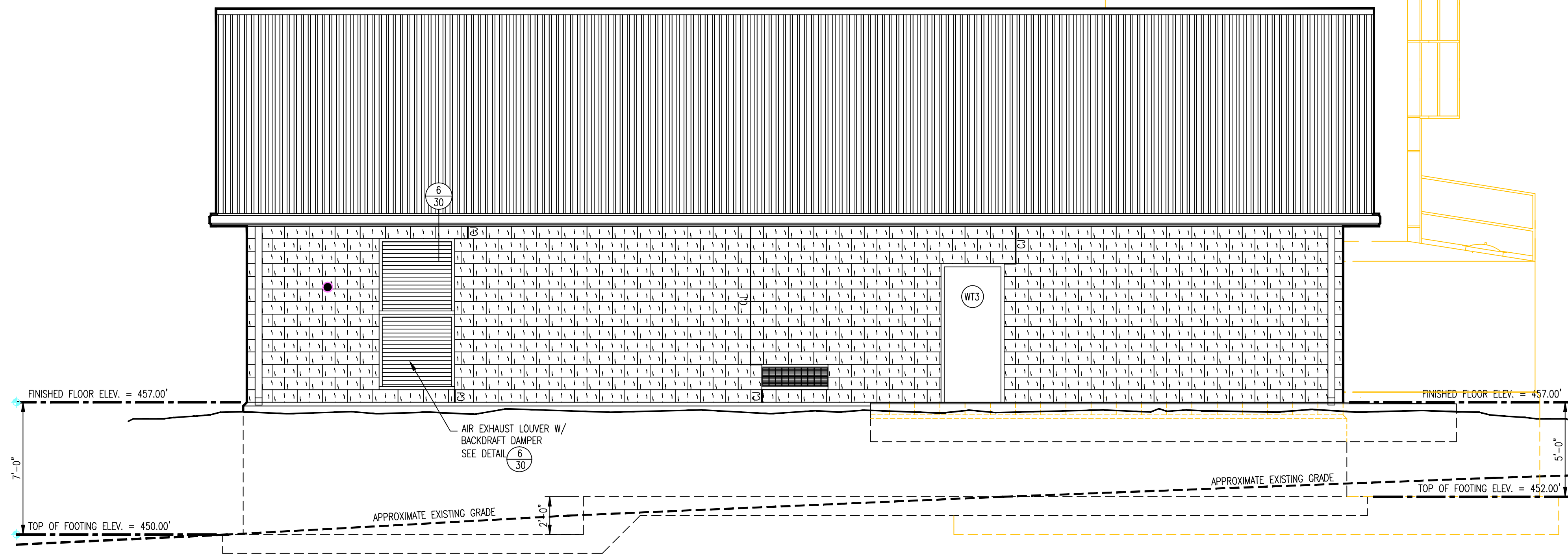


5 CHLORINE ROOM DOOR LOUVER DETAIL
11 NO SCALE

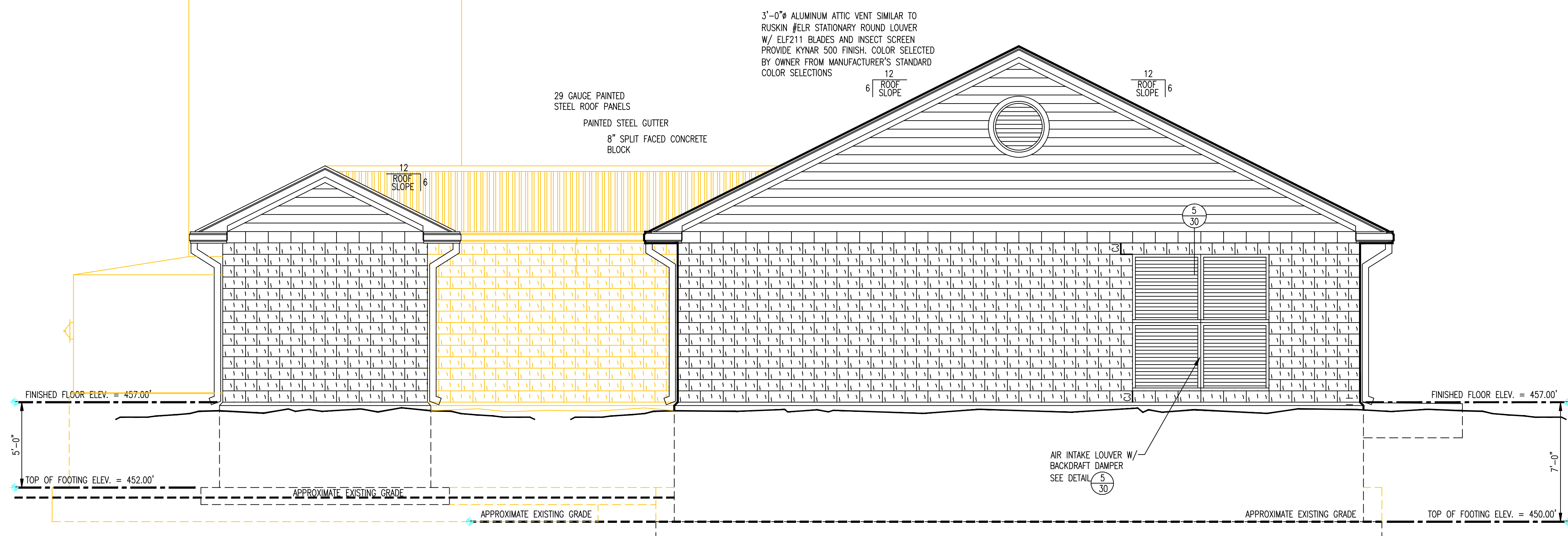
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INDIANA DEPARTMENT OF NATURAL RESOURCES D.A.P.W. PROJECT NO. E030094		DRAWN BY:
CHARLESTOWN STATE PARK WATER SUPPLY IMPROVEMENTS DIVISION II - WELLS, WTP & BOOSTER STATION		REVISED:
WATER TREATMENT PLANT WALL SECTION AND DETAILS		
DATE: NOVEMBER 5, 2009	APPROVED BY: <i>Richard L. Battershell</i>	DRAWING NUMBER: 11 OF 36

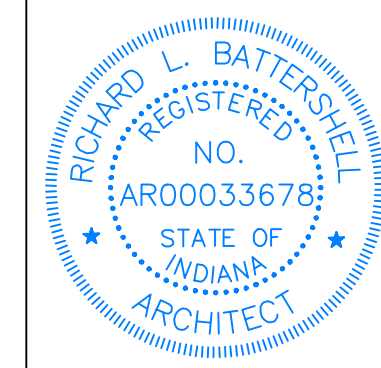


1 SOUTH ELEVATION
12 SCALE 1/4" = 1'-0"

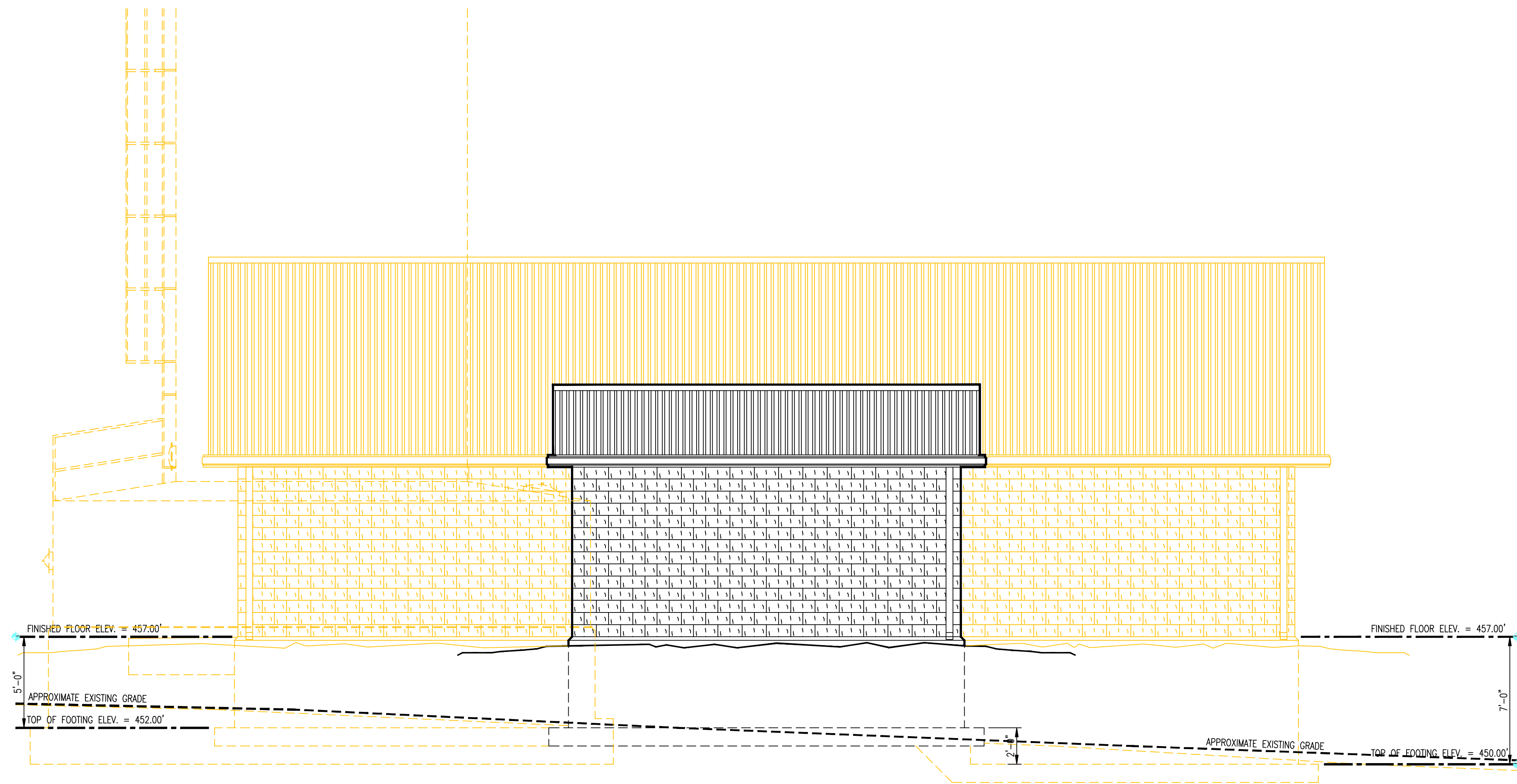


2 WEST ELEVATION
12 SCALE 1/4" = 1'-0"

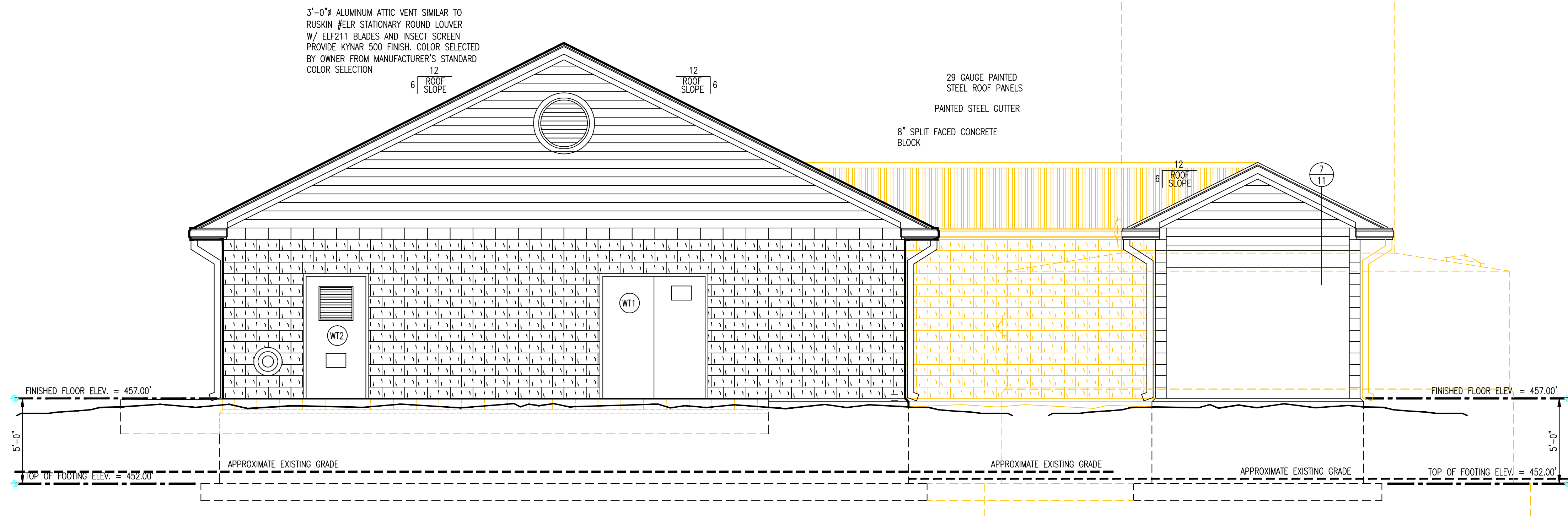
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CHARLESTOWN STATE PARK WATER SUPPLY IMPROVEMENTS DIVISION II - WELLS, WTP & BOOSTER STATION		DRAWN BY:	Richard L. Battershell
WATER TREATMENT PLANT EXTERIOR ELEVATIONS		REVISIONS:	
		DRAWING NUMBER:	12 OF 36

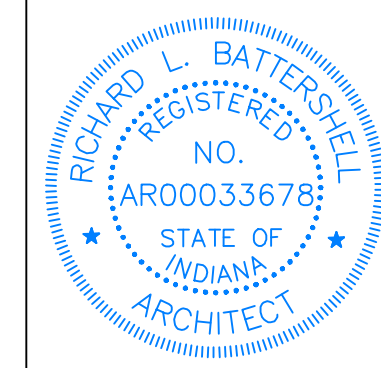


1 NORTH ELEVATION
SCALE 1/4" = 1'-0"



2 EAST ELEVATION
SCALE 1/4" = 1'-0"

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CHARLESTOWN STATE PARK WATER SUPPLY IMPROVEMENTS DIVISION II - WELLS, WTP & BOOSTER STATION		REVISED:
WATER TREATMENT PLANT EXTERIOR ELEVATIONS		
DATE: NOVEMBER 5, 2009	Richard L. Battershell	DRAWING NUMBER: 13 OF 36

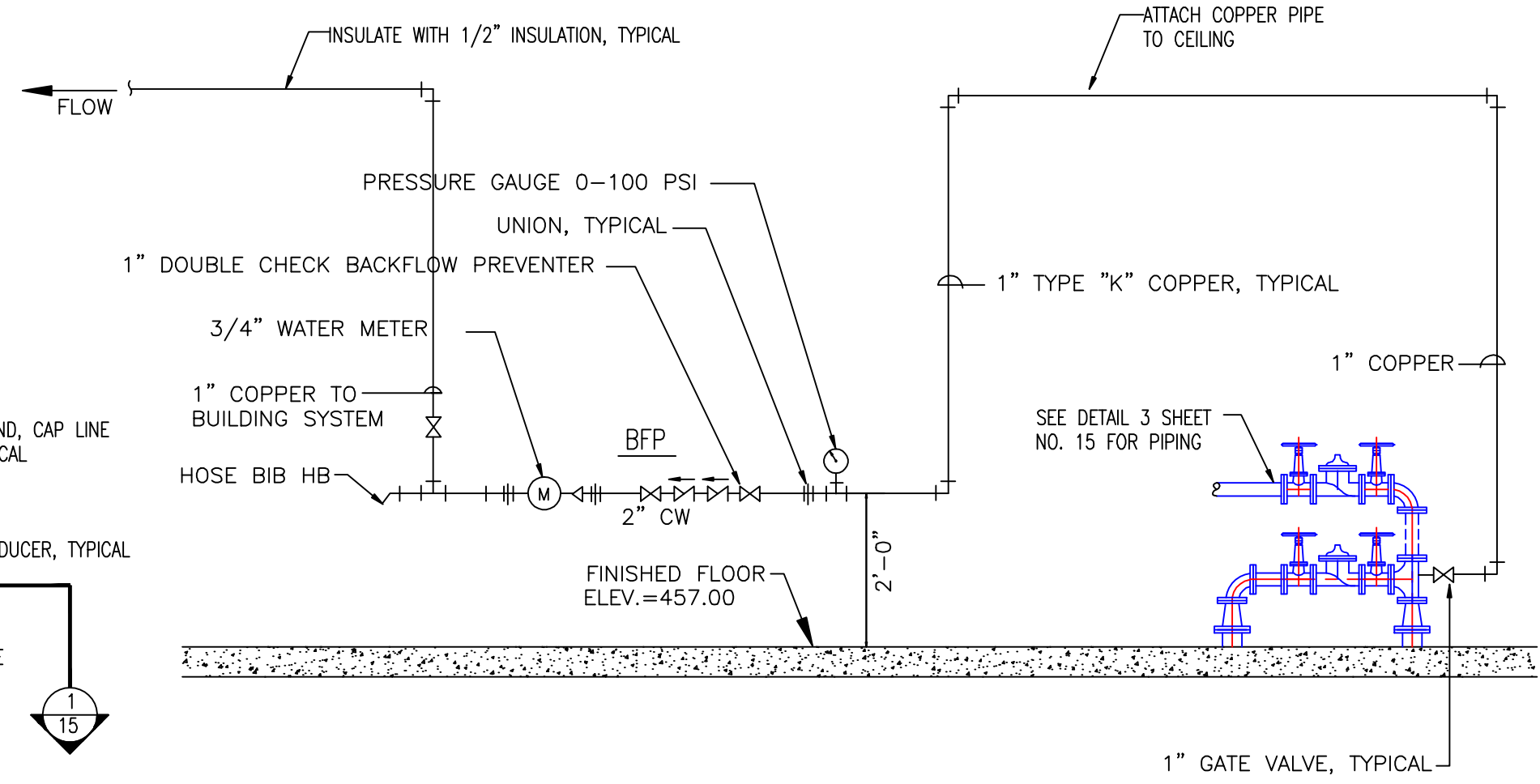
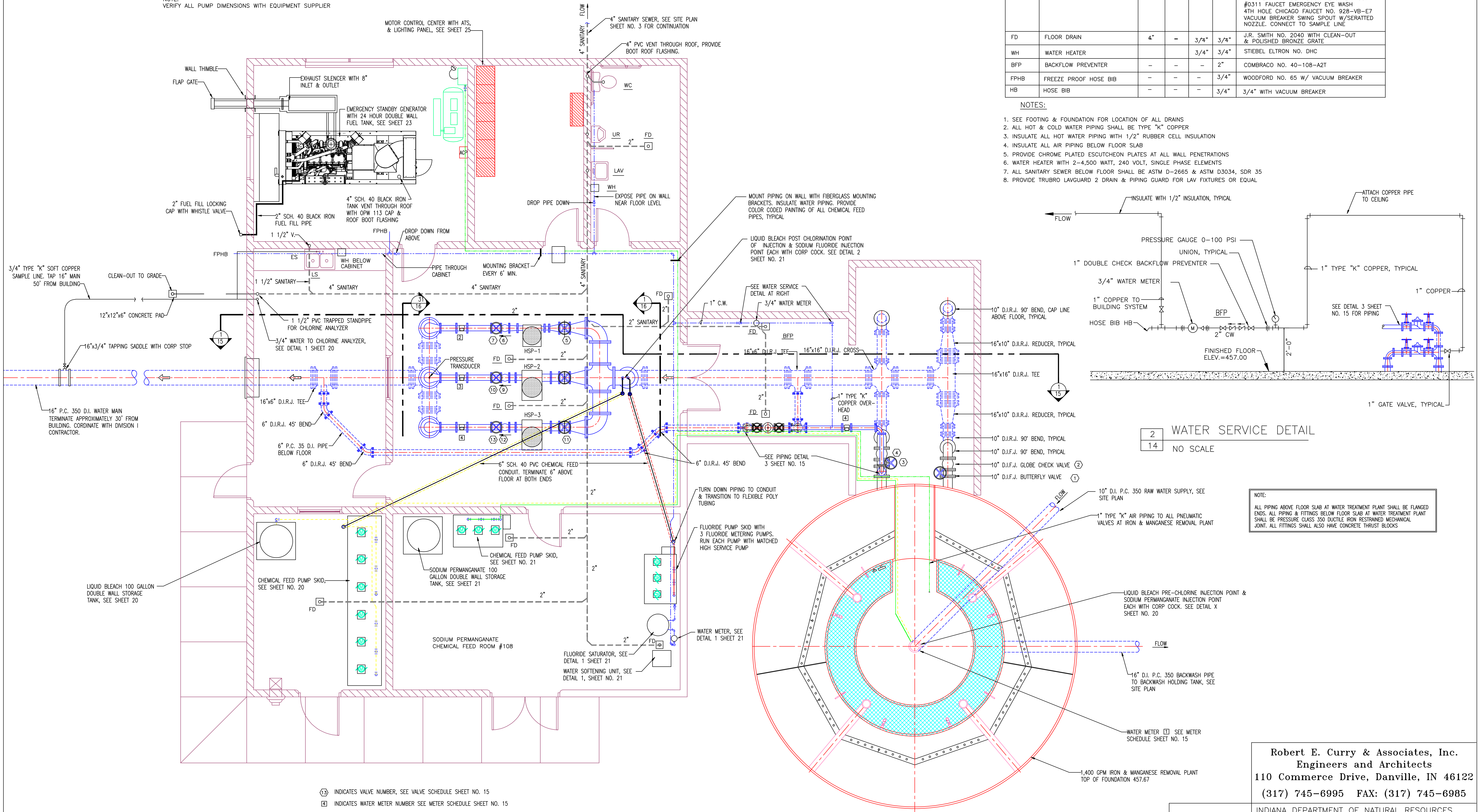
PUMP DATA										MOTOR DATA				
PUMP NO.	PUMP NAME	FLOW RATE	TDH	RPM	MFG	MODEL NO.	PUMP SIZE	TYPE	HP	VOLTAGE	PHASE	TYPE MOTOR	MFG.	CONTROL
1	HIGH SERVICE PUMP NO. 1	700 GPM	260'	1800	AMERICAN MARSH	340	4x5x18HD	SPLIT-CASE	75	480	3	VERT. HOLLOW SHAFT	U.S.	SOLID STATE SOFT START
2	HIGH SERVICE PUMP NO. 2	1,400 GPM	265'	1800	AMERICAN MARSH	340	6x8x18HD	SPLIT-CASE	100	480	3	VERT. HOLLOW SHAFT	U.S.	SOLID STATE SOFT START
3	HIGH SERVICE PUMP NO. 3	1,400 GPM	265'	1800	AMERICAN MARSH	340	6x8x18HD	SPLIT-CASE	100	480	3	VERT. HOLLOW SHAFT	U.S.	SOLID STATE SOFT START

NOTE:
VERIFY ALL PUMP DIMENSIONS WITH EQUIPMENT SUPPLIER

PLUMBING FIXTURE SCHEDULE						REMARKS
FIXTURE	FIXTURE DESCRIPTION	WASTE	VENT	HW	CW	
WC	WATER CLOSET	4"	4"		1/2"	AMERICAN STANDARD NO. 29998.012 WITH OLSONITE NO. OPEN FRONT SEAT
LAV	LAVATORY	1 1/2"	1 1/2"	1/2"	1/2"	AMERICAN STANDARD NO. 0124.131 WITH NO. 2175.500 FAUCET ON 4" CENTERS
UR	URINAL	2"	1 1/2"		1/2"	AMERICAN STANDARD NO. 6501.01
LS	LAB SINK	1 1/2"	1 1/2"	1/2"	1/2"	ELKAY NO. PSR-3322 DOUBLE COMPARTMENT W/ NO. 2432 WINGED FAUCET SET & BASKET STRAINER. PROVIDE INDUSTRIAL SAFETY CO. #0311 FAUCET EMERGENCY EYE WASH 4TH HOLE CHICAGO FAUCET NO. 928-VB-E7 VACUUM BREAKER SWING SPOUT W/SERATTED NOZZLE. CONNECT TO SAMPLE LINE
FD	FLOOR DRAIN	4"		3/4"	3/4"	J.R. SMITH NO. 2040 WITH CLEAN-OUT & POLISHED BRONZE GRATE
WH	WATER HEATER			3/4"	3/4"	STIEBEL ELTRON NO. DHC
BFP	BACKFLOW PREVENTER				2"	COMBRACO NO. 40-108-A2T
FPHB	FREEZE PROOF HOSE BIB				3/4"	WOODFORD NO. 65 W/ VACUUM BREAKER
HB	HOSE BIB				3/4"	3/4" WITH VACUUM BREAKER

NOTES:

- SEE FOOTING & FOUNDATION FOR LOCATION OF ALL DRAINS
- ALL HOT & COLD WATER PIPING SHALL BE TYPE "K" COPPER
- INSULATE ALL HOT WATER PIPING WITH 1/2" RUBBER CELL INSULATION
- INSULATE ALL AIR PIPING BELOW FLOOR SLAB
- PROVIDE CHROME PLATED ESCUTCHEON PLATES AT ALL WALL PENETRATIONS
- WATER HEATER WITH 2-4,500 WATT, 240 VOLT, SINGLE PHASE ELEMENTS
- ALL SANITARY SEWER BELOW FLOOR SHALL BE ASTM D-2665 & ASTM D3034, SDR 35
- PROVIDE TRUBRO LAVGUARD 2 DRAIN & PIPING GUARD FOR LAV FIXTURES OR EQUAL



2 WATER SERVICE DETAIL

14 NO SCALE

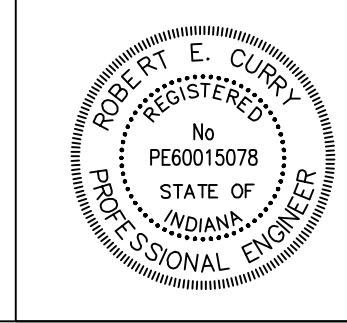
NOTE:
ALL PIPING ABOVE FLOOR SLAB AT WATER TREATMENT PLANT SHALL BE FLANGED ENDS. ALL PIPING & FITTINGS BELOW FLOOR SLAB AT WATER TREATMENT PLANT SHALL BE PRESSURE CLASS 350 DUCTILE IRON RESTRAINED MECHANICAL JOINT. ALL FITTINGS SHALL ALSO HAVE CONCRETE THRUST BLOCKS

⑬ INDICATES VALVE NUMBER, SEE VALVE SCHEDULE SHEET NO. 15
⑭ INDICATES WATER METER NUMBER SEE METER SCHEDULE SHEET NO. 15

2 WTP PIPING PLAN
14 SCALE: 1/4" = 1'-0"

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INDIANA DEPARTMENT OF NATURAL RESOURCES
D.A.P.W. PROJECT NO. E030094
CHARLESTOWN STATE PARK
WATER SUPPLY IMPROVEMENTS
DIVISION II--WELLS, WTP & BOOSTER STATION
WTP PIPING PLAN
DATE: APPROVED BY: DRAWING NUMBER:
14 OF 36

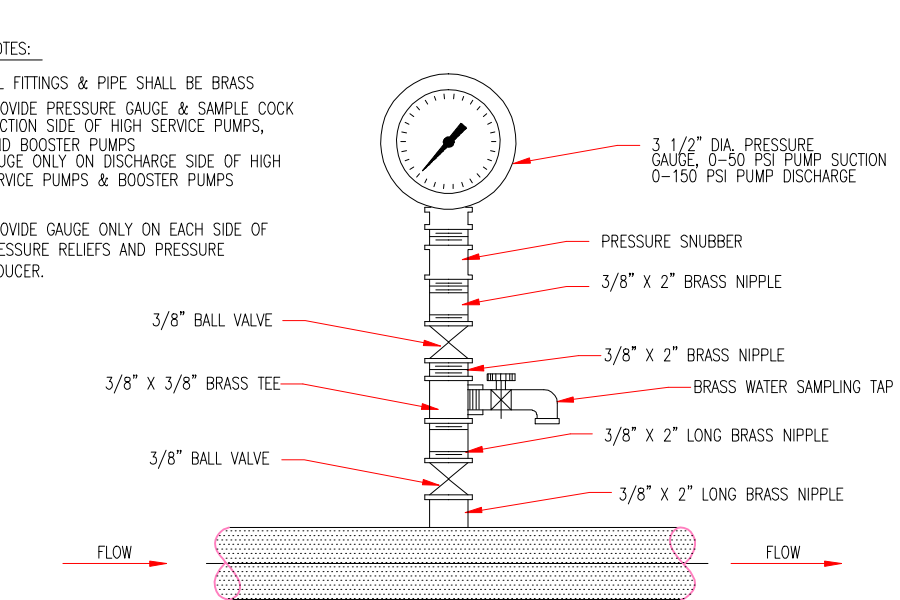
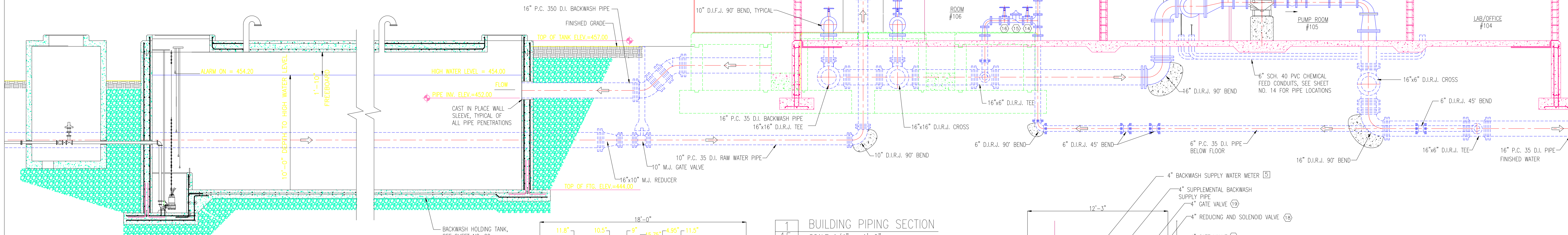


WELLS, SITE, & WATER TREATMENT PLANT VALVE SCHEDULE							
VALVE NO.	SIZE	ENDS	TYPE	FUNCTION	OPERATION	AWWA NUMBER	MODEL NUMBER
1	10"	FLANGED	BUTTERFLY VALVE	IRON REMOVAL PLANT DISCHARGE	GEAR OPERATED HANDWHEEL	AWWA C504, CLASS 150B, ANSI A21.11, B16.1	DEZURIK BAW
2	10"	FLANGED	GLOBE STYLE CHECK VALVE	IRON REMOVAL PLANT DISCHARGE	SPRING WITH DISC	ASTM 60-45-10, ASTM A536 BODY	APCO 610
3	10"	FLANGED	BUTTERFLY VALVE	IRON REMOVAL PLANT DISCHARGE	GEAR OPERATED HANDWHEEL	AWWA C504, CLASS 150B, ANSI A21.11, B16.1	DEZURIK BAW
4	10"	FLANGED	GLOBE STYLE CHECK VALVE	IRON REMOVAL PLANT DISCHARGE	SPRING WITH DISC	ASTM 60-45-10, ASTM A536 BODY	APCO 610
5	8"	FLANGED	RESILIENT SEAT GATE VALVE	HIGH SERVICE PUMP NO. 1 SUCTION	GEAR OPERATED HANDWHEEL	AWWA C509, CLASS 150B, ANSI A21.11, B16.1	M&H 4067-02
6	6"	FLANGED	GLOBE STYLE CHECK VALVE	HIGH SERVICE PUMP NO. 1 DISCHARGE	SPRING WITH DISC	ASTM 60-45-10, ASTM A536 BODY	APCO 608
7	6"	FLANGED	RESILIENT SEAT GATE VALVE	HIGH SERVICE PUMP NO. 2 SUCTION	GEAR OPERATED HANDWHEEL	AWWA C509, CLASS 150B, ANSI A21.11, B16.1	M&H 4067-02
8	8"	FLANGED	RESILIENT SEAT GATE VALVE	HIGH SERVICE PUMP NO. 2 DISCHARGE	GEAR OPERATED HANDWHEEL	AWWA C509, CLASS 150B, ANSI A21.11, B16.1	M&H 4067-02
9	6"	FLANGED	GLOBE STYLE CHECK VALVE	HIGH SERVICE PUMP NO. 2 DISCHARGE	SPRING WITH DISC	ASTM 60-45-10, ASTM A536 BODY	APCO 608
10	6"	FLANGED	RESILIENT SEAT GATE VALVE	HIGH SERVICE PUMP NO. 3 SUCTION	GEAR OPERATED HANDWHEEL	AWWA C509, CLASS 150B, ANSI A21.11, B16.1	M&H 4067-02
11	8"	FLANGED	RESILIENT SEAT GATE VALVE	HIGH SERVICE PUMP NO. 3 DISCHARGE	GEAR OPERATED HANDWHEEL	AWWA C509, CLASS 150B, ANSI A21.11, B16.1	M&H 4067-02
12	6"	FLANGED	GLOBE STYLE CHECK VALVE	HIGH SERVICE PUMP NO. 3 DISCHARGE	SPRING WITH DISC	ASTM 60-45-10, ASTM A536 BODY	APCO 608
13	6"	FLANGED	RESILIENT SEAT GATE VALVE	HIGH SERVICE PUMP NO. 3 DISCHARGE	GEAR OPERATED HANDWHEEL	AWWA C509, CLASS 150B, ANSI A21.11, B16.1	M&H 4067-02
14	4"	FLANGED	RESILIENT SEAT GATE VALVE ISOLATION	PRESSURE RELIEF VALVE ISOLATION	GEAR OPERATED HANDWHEEL	AWWA C509, CLASS 150B, ANSI A21.11, B16.1	M&H 4067-02
15	4"	FLANGED	PUMP DISCHARGE PRESSURE RELIEF VALVE	PRESSURE RELIEF VALVE	HYDRAULIC	ASTM A536, CLASS 150B, ANSI B16.42	CLA-VAL NO. 50-01
16	4"	FLANGED	RESILIENT SEAT GATE VALVE	PRESSURE RELIEF VALVE ISOLATION	GEAR OPERATED HANDWHEEL	AWWA C509, CLASS 150B, ANSI A21.11, B16.1	M&H 4067-02
17	4"	FLANGED	RESILIENT SEAT GATE VALVE	PRESSURE REDUCING VALVE ISOLATION	GEAR OPERATED HANDWHEEL	AWWA C509, CLASS 150B, ANSI A21.11, B16.1	M&H 4067-02
18	4"	FLANGED	BACKWASH SUPPLY & SUPPLEMENT VALVE	PRESS. REDUCING & SOLENOID VALVE	HYDRAULIC & ELECTRIC	ASTM A536, CLASS 150B, ANSI B16.42	CLA-VAL NO. 93-01
19	4"	FLANGED	RESILIENT SEAT GATE VALVE	PRESSURE REDUCING VALVE ISOLATION	GEAR OPERATED HANDWHEEL	AWWA C509, CLASS 150B, ANSI A21.11, B16.1	M&H 4067-02
20	4"	FLANGED	SWING CHECK VALVE	BACKWASH WASTE PUMP CHECK VALVE	WEIGHTED SWING CHECK	ASTM 126, GR. B, A536, B148, A276, A582	APCO NO. 6004
21	4"	FLANGED	SWING CHECK VALVE	BACKWASH WASTE PUMP CHECK VALVE	WEIGHTED SWING CHECK	ASTM 126, GR. B, A536, B148, A276, A582	APCO NO. 6004
22	4"	FLANGED	RESILIENT SEAT PLUG VALVE	BACKWASH WASTE PUMP ISOLATION	GEAR OPERATED HANDWHEEL	AWWA C509, CLASS 150B, ANSI A21.11, B16.1	M&H 4067-02
23	4"	FLANGED	RESILIENT SEAT PLUG VALVE	BACKWASH WASTE PUMP ISOLATION	GEAR OPERATED HANDWHEEL	ASTM A536, CLASS 150B, ANSI B16.42	CLA-VAL NO. 93-01
24	4"	FLANGED	RESILIENT SEAT PLUG VALVE	BACKWASH WASTE PUMP ISOLATION	GEAR OPERATED HANDWHEEL	ASTM A216, GRADE WCB, A351, B16.42	DEZURIK PERMASEAL
25	8"	FLANGED	SWING CHECK VALVE	WELL NO. 1 VALVE VAULT	RUBBER FLAPPER	ASTM 126, GR. B, A536, B148, A296, 584	APCO NO. SERIES 108
26	8"	FLANGED	SWING CHECK VALVE	WELL NO. 2 VALVE VAULT	RUBBER FLAPPER	ASTM 126, GR. B, A536, B148, A296, 584	APCO NO. SERIES 108
27	8"	FLANGED	SWING CHECK VALVE	WELL NO. 3 VALVE VAULT	RUBBER FLAPPER	ASTM 126, GR. B, A536, B148, A296, 584	APCO NO. SERIES 108
28	8"	FLANGED	RESILIENT SEAT GATE VALVE	WELL NO. 1 VALVE VAULT	GEAR OPERATED HANDWHEEL	AWWA C509, CLASS 150B, ANSI A21.11, B16.1	M&H 4067-02
29	8"	FLANGED	RESILIENT SEAT GATE VALVE	WELL NO. 2 VALVE VAULT	GEAR OPERATED HANDWHEEL	AWWA C509, CLASS 150B, ANSI A21.11, B16.1	M&H 4067-02
30	8"	FLANGED	RESILIENT SEAT GATE VALVE	WELL NO. 3 VALVE VAULT	GEAR OPERATED HANDWHEEL	AWWA C509, CLASS 150B, ANSI A21.11, B16.1	M&H 4067-02
31	1"	M.J.	RESILIENT SEAT GATE VALVE	RAW WATER INLET SITE PIPING	NUT WITH C.I. VALVE BOX	AWWA C509, CLASS 150B, ANSI A21.11, B16.1	M&H 4067-02

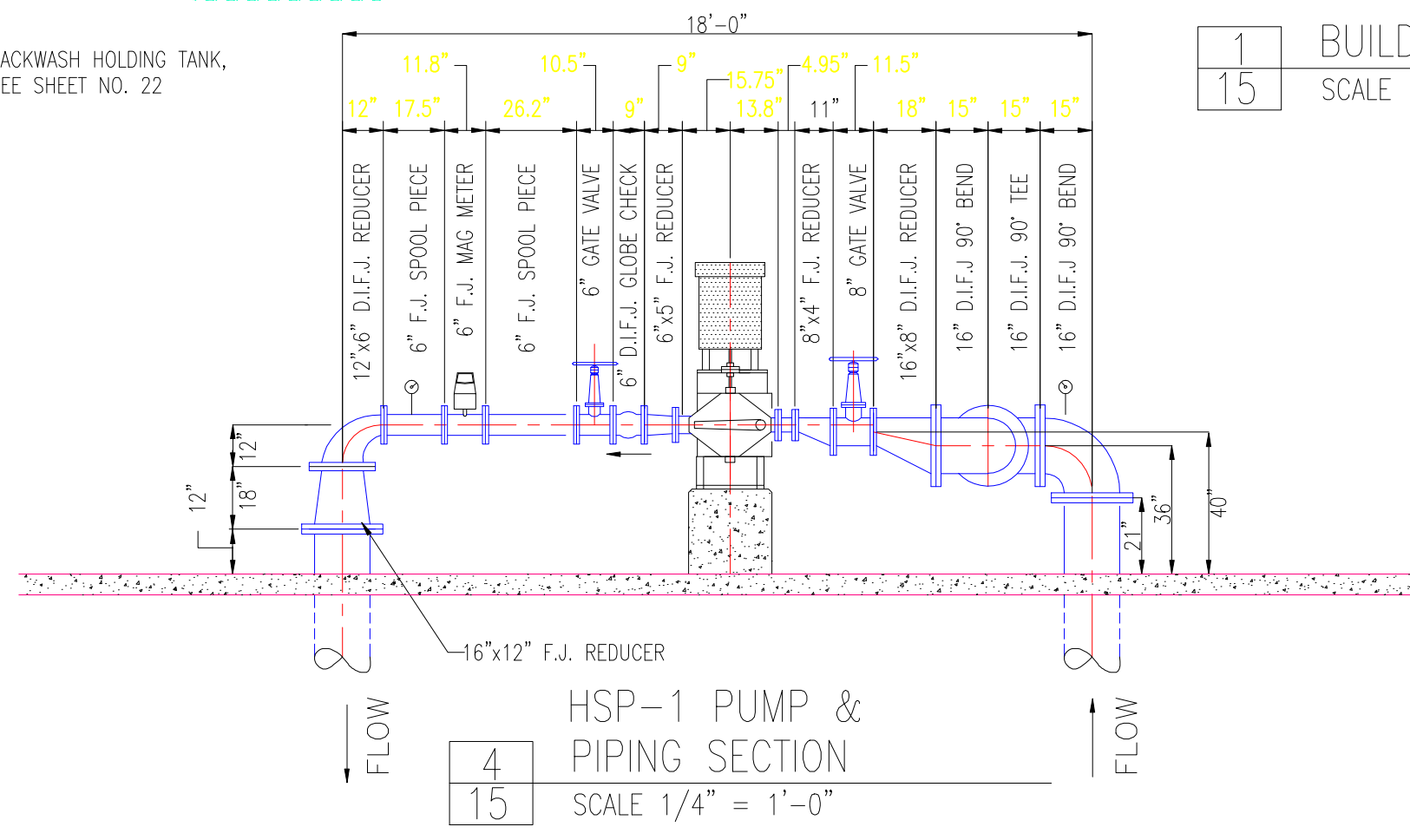
- NOTE:
- SEE BOOSTER STATION VALVE SCHEDULE SHEET NO. 31 FOR ADDITIONAL VALVES FOR THIS PROJECT
 - SEE SHEET NO. 17 FOR IRON REMOVAL PLANT VALVES & PNEUMATIC ACTUATORS REQUIREMENTS
 - ALL VALVES AND PNEUMATIC OPERATORS INSIDE IRON REMOVAL PLANT SHALL BE BY IRON & MANGANESE REMOVAL PLANT MANUFACTURER INCLUDING 10" INLET CONTROL VALVE AND 2" PRESSURE RELIEF VALVES
 - VALVES SHOWN ABOVE ARE FOR 4" AND LARGER VALVES ONLY

WATER TREATMENT PLANT METER SCHEDULE										
METER NO.	SIZE	ENDS	TYPE	WATER TREATMENT PLANT LOCATION	FUNCTION	PRESSURE RATING	FLOW RATE	SIGNAL	POWER	EQUAL TO MODEL NUMBER
1	10"	FLANGED	MAG	RAW WATER INLET AT AEROLATER	RAW WATER	150 PSI	176-7,040 GPM	4-20 mA TO SCADA	120V, 1 PHASE	SIEMENS SITRANS FM MAGFLO NO. 5100W
2	6"	FLANGED	MAG	HIGH SERVICE NO. 1 PUMP DISCHARGE	FINISHED WATER	150 PSI	110-4,400 GPM	4-20 mA TO SCADA	120V, 1 PHASE	SIEMENS SITRANS FM MAGFLO NO. 5100W
3	6"	FLANGED	MAG	HIGH SERVICE NO. 2 PUMP DISCHARGE	FINISHED WATER	150 PSI	110-4,400 GPM	4-20 mA TO SCADA	120V, 1 PHASE	SIEMENS SITRANS FM MAGFLO NO. 5100W
4	6"	FLANGED	MAG	HIGH SERVICE NO. 3 PUMP DISCHARGE	FINISHED WATER	150 PSI	110-4,400 GPM	4-20 mA TO SCADA	120V, 1 PHASE	SIEMENS SITRANS FM MAGFLO NO. 5100W
5	4"	FLANGED	MAG	BACKWASH SUPPLY TO IRON REMOVAL PLANT	BACKWASH SUPPLY	150 PSI	27-1,100 GPM	4-20 mA TO SCADA	120V, 1 PHASE	SIEMENS SITRANS FM MAGFLO NO. 5100W
6	1"	THREAD	POS. DISP.	DOMESTIC	DOMESTIC	150 PSI	3-50 GPM		SELF GEN.	SENSUS SR II

- NOTE:
- SEE BOOSTER STATION METER SCHEDULE SHEET NO. 31 FOR ADDITIONAL METERS FOR THIS PROJECT

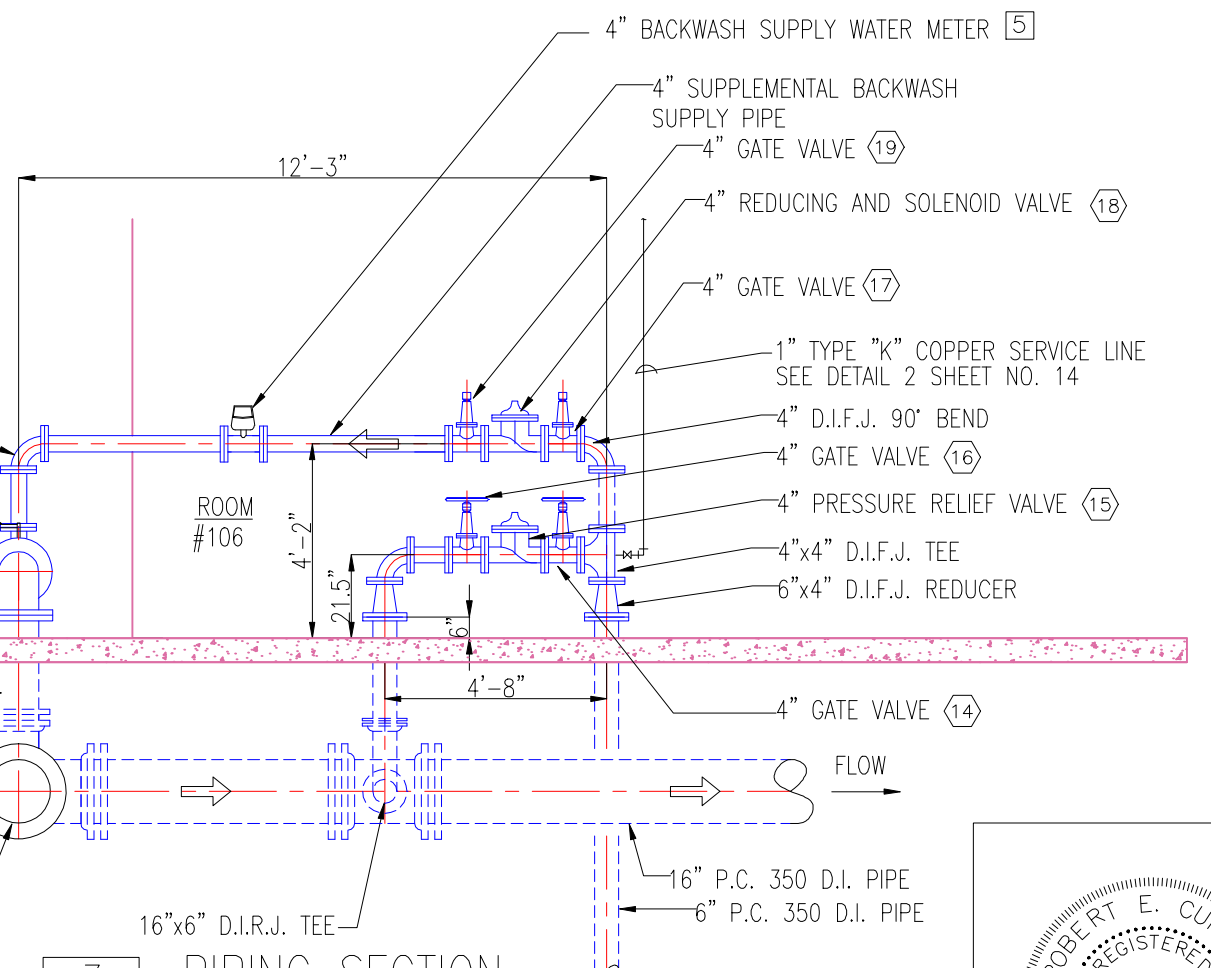


5 PRESSURE GAUGE & SAMPLE COCK ASSEMBLY
NO SCALE



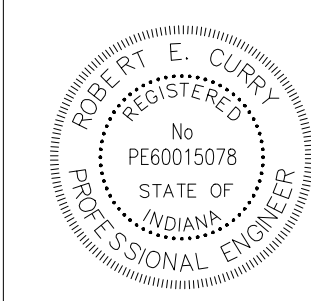
4 HSP-1 PUMP & PIPING SECTION
SCALE 1/4" = 1'-0"

1 BUILDING PIPING SECTION
SCALE 1/4" = 1'-0"

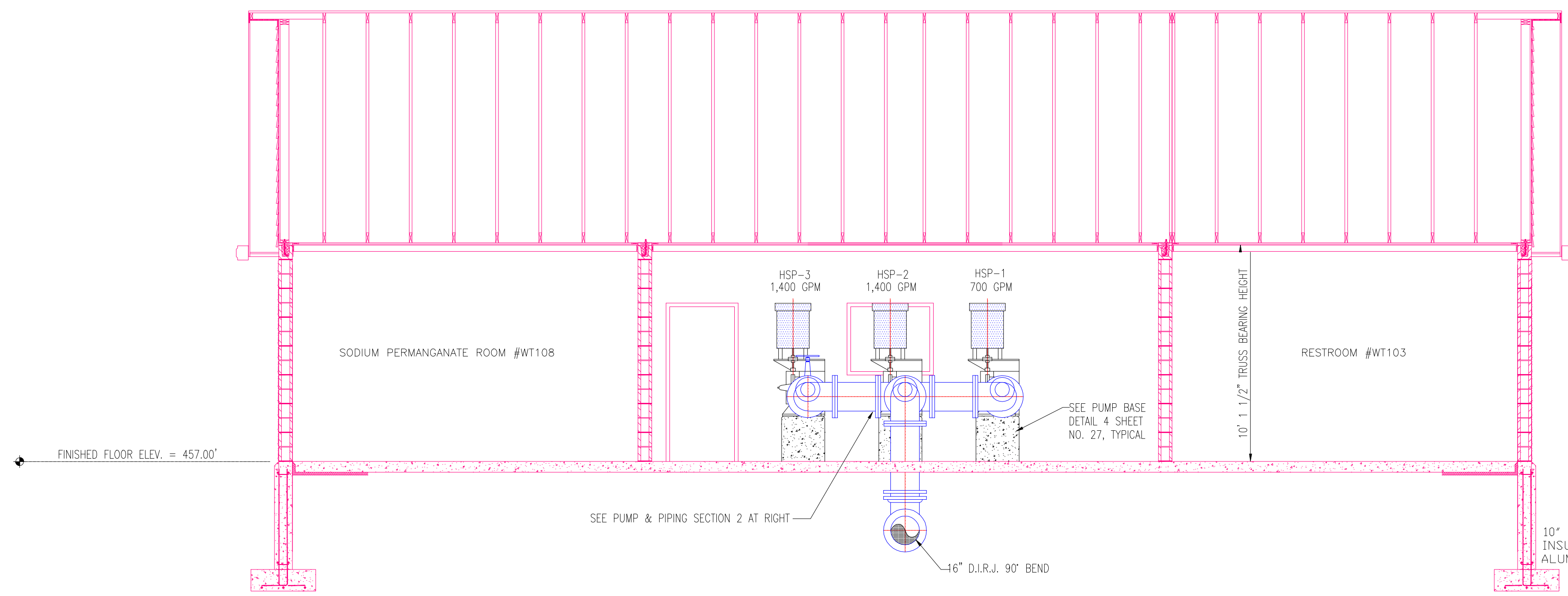


3 PIPING SECTION
SCALE 1/4" = 1'-0"

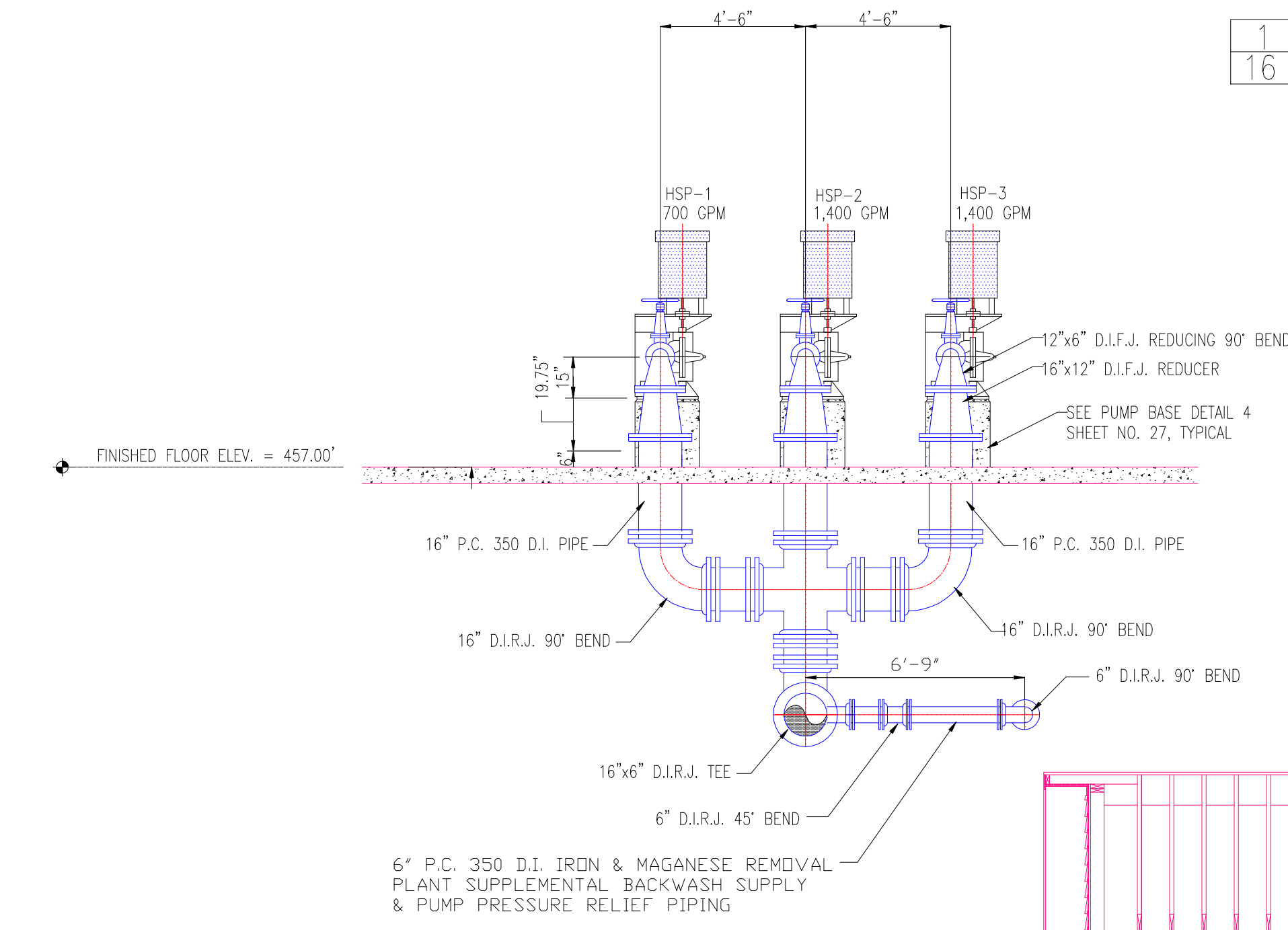
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CHARLESTOWN STATE PARK WATER SUPPLY IMPROVEMENTS DIVISION II-WELLS, WTP & BOOSTER STATION		
DATE:	APPROVED BY:	DRAWING NUMBER:
		15 OF 36

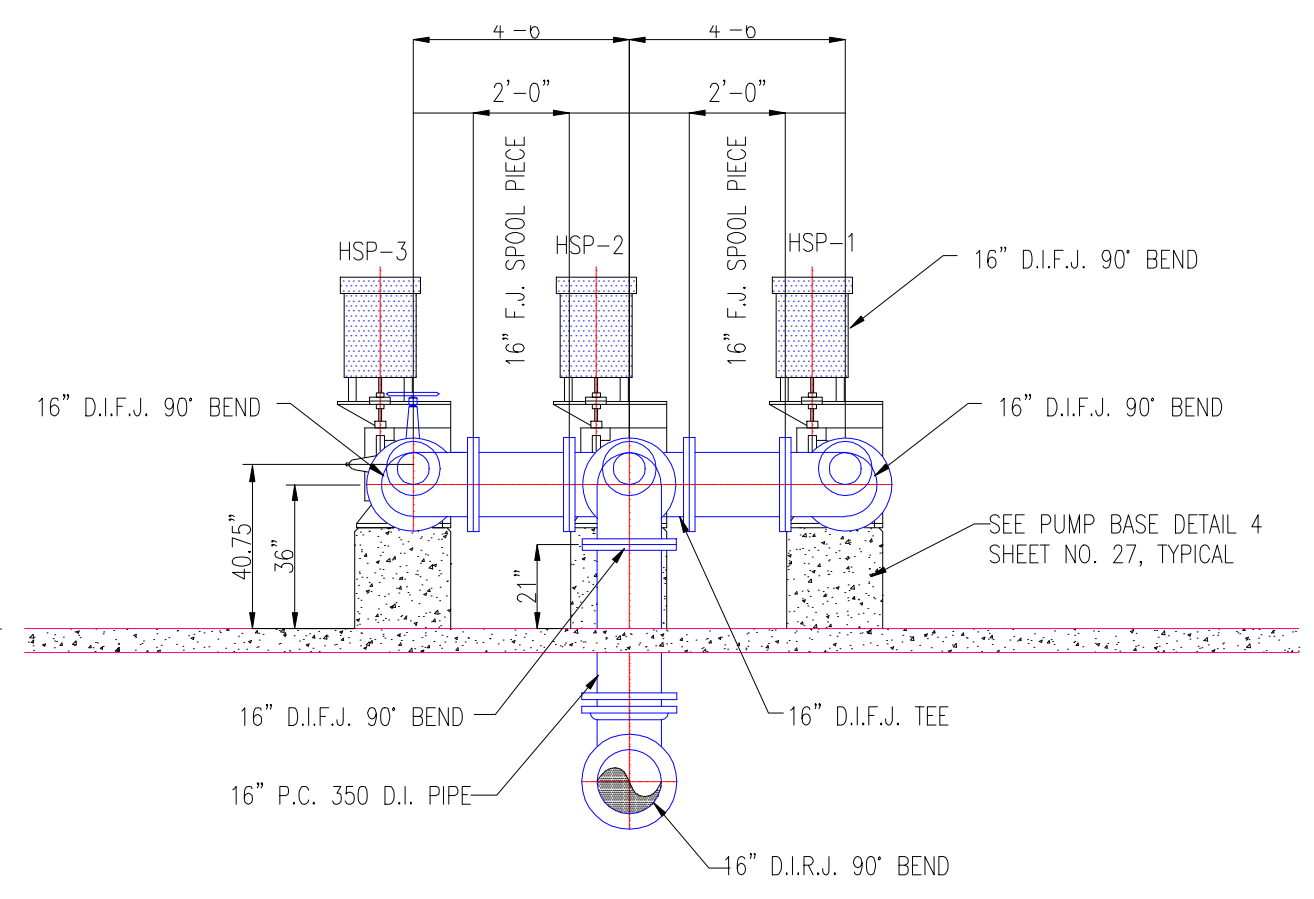


1
16 SUCTON PIPING SECTION
SCALE 1/4" = 1'-0"

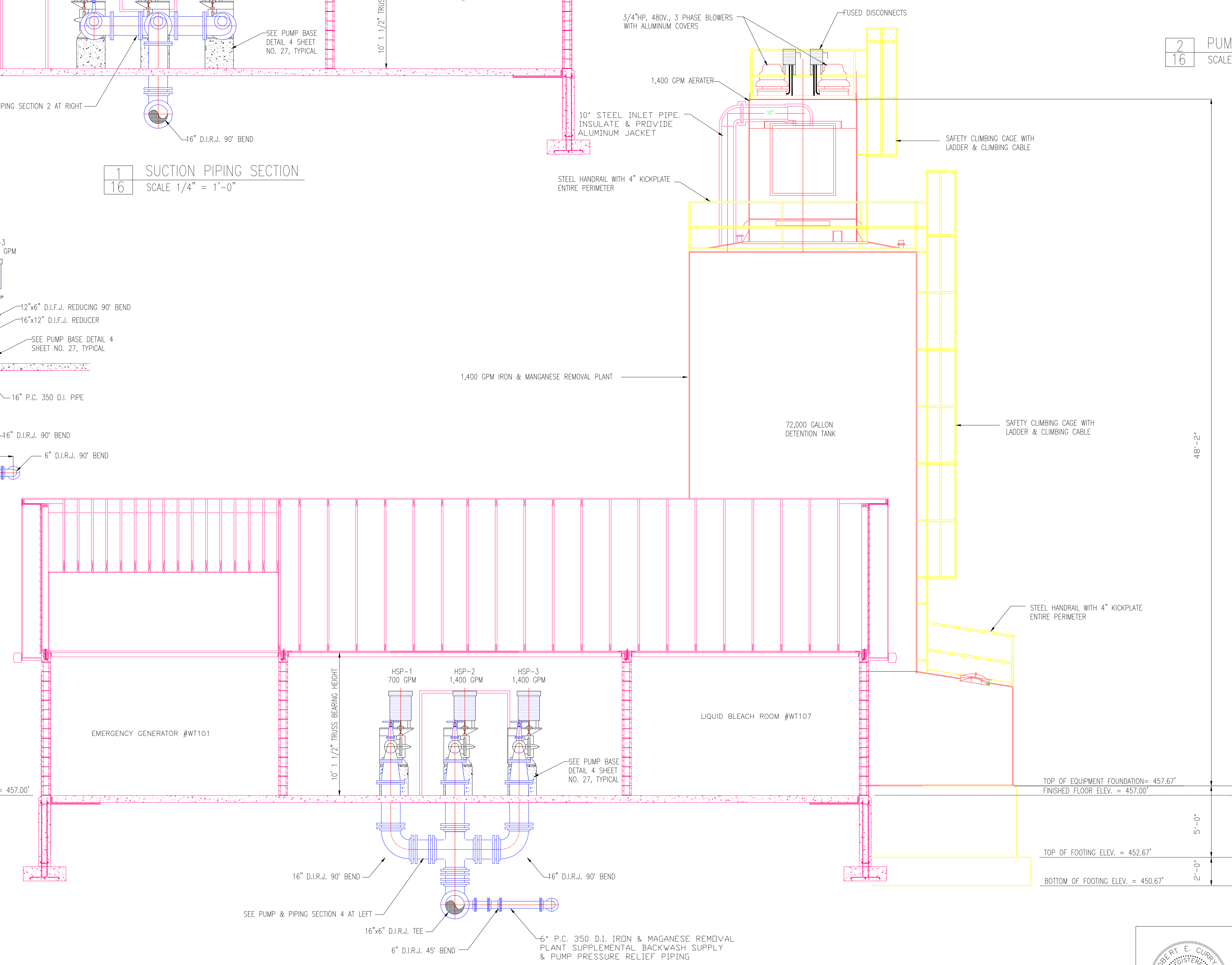


4
16 PUMP & DISCHARGE PIPING END SECTION
SCALE 1/4" = 1'-0"

NOTE:
ALL PIPING ABOVE FLOOR SLAB AT WATER TREATMENT PLANT SHALL BE FLANGED ENDS. ALL PIPING & FITTINGS BELOW FLOOR SLAB AT WATER TREATMENT PLANT SHALL BE PRESSURE CLASS 350 DUCTILE IRON RESTRAINED MECHANICAL JOINT. ALL FITTINGS SHALL ALSO HAVE CONCRETE THRUST BLOCKS



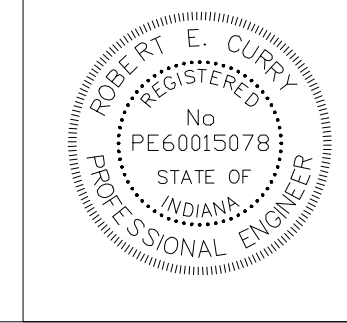
2
16 PUMP & SUCTION PIPING END SECTION
SCALE 1/4" = 1'-0"

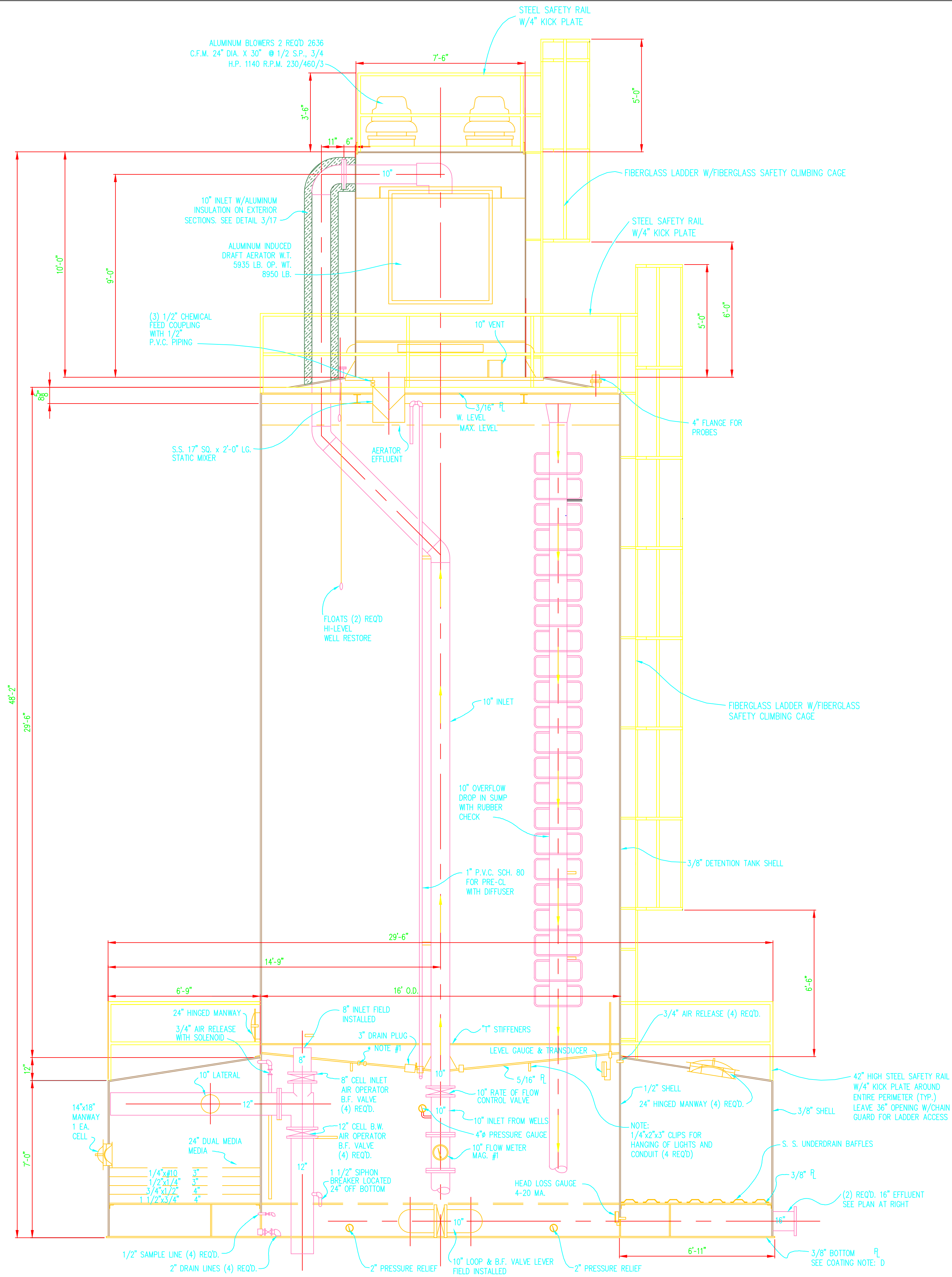


3
16 DISCHARGE PIPING SECTION
SCALE 1/4" = 1'-0"

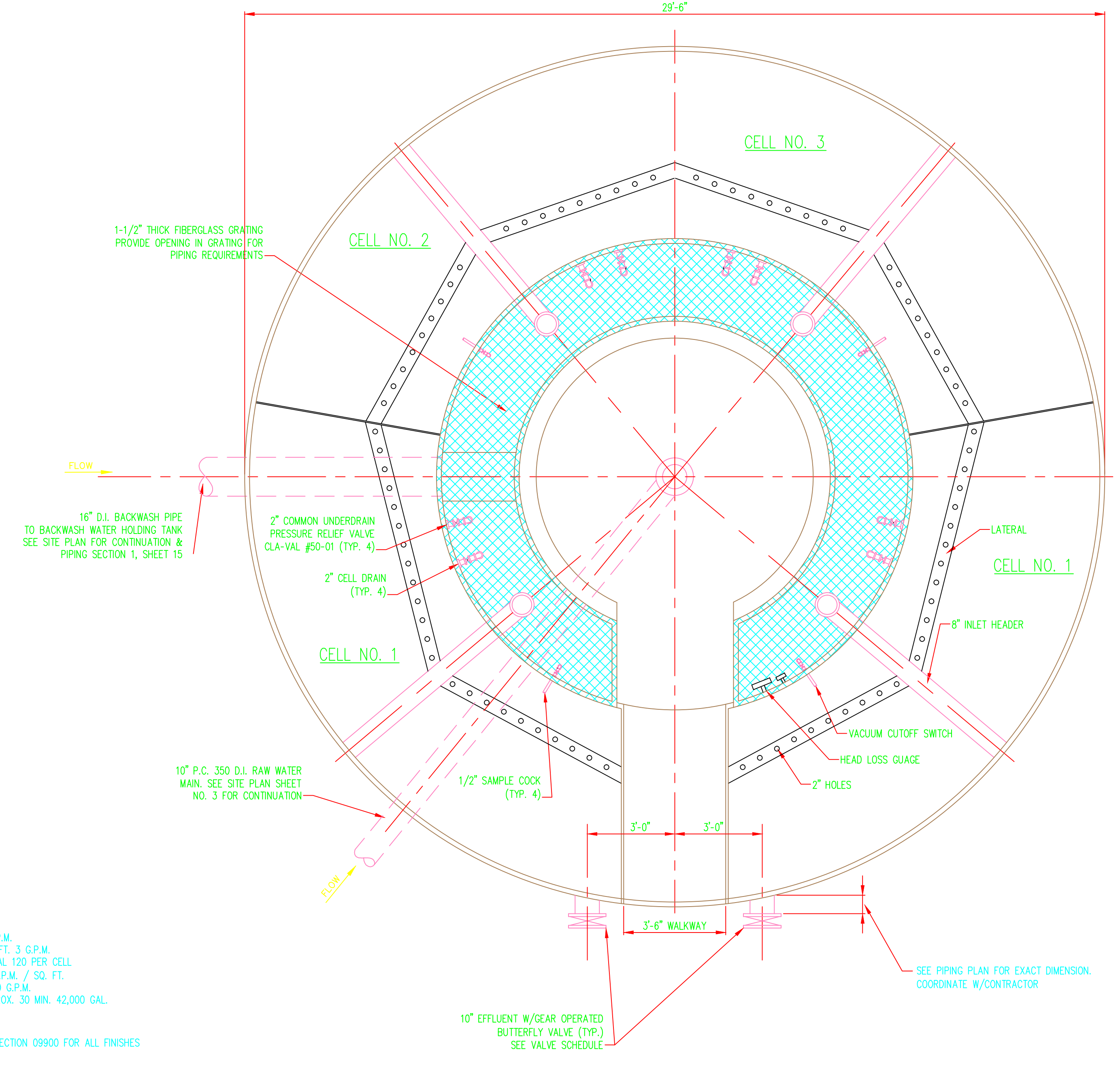
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CHARLESTOWN STATE PARK
WATER SUPPLY IMPROVEMENTS
DIVISION II--WELLS, WTP & BOOSTER STATION
WTP PIPING & PUMP SECTIONS
DRAWN BY: []
REVIEWED: []
DATE: [] APPROVED BY: [] DRAWING NUMBER: 16 OF 36





1,400 GPM IRON & MANGANESE REMOVAL UNIT
 1 SCHEMATIC CROSS SECTION
 17 SCALE: 3/8" = 1'-0"

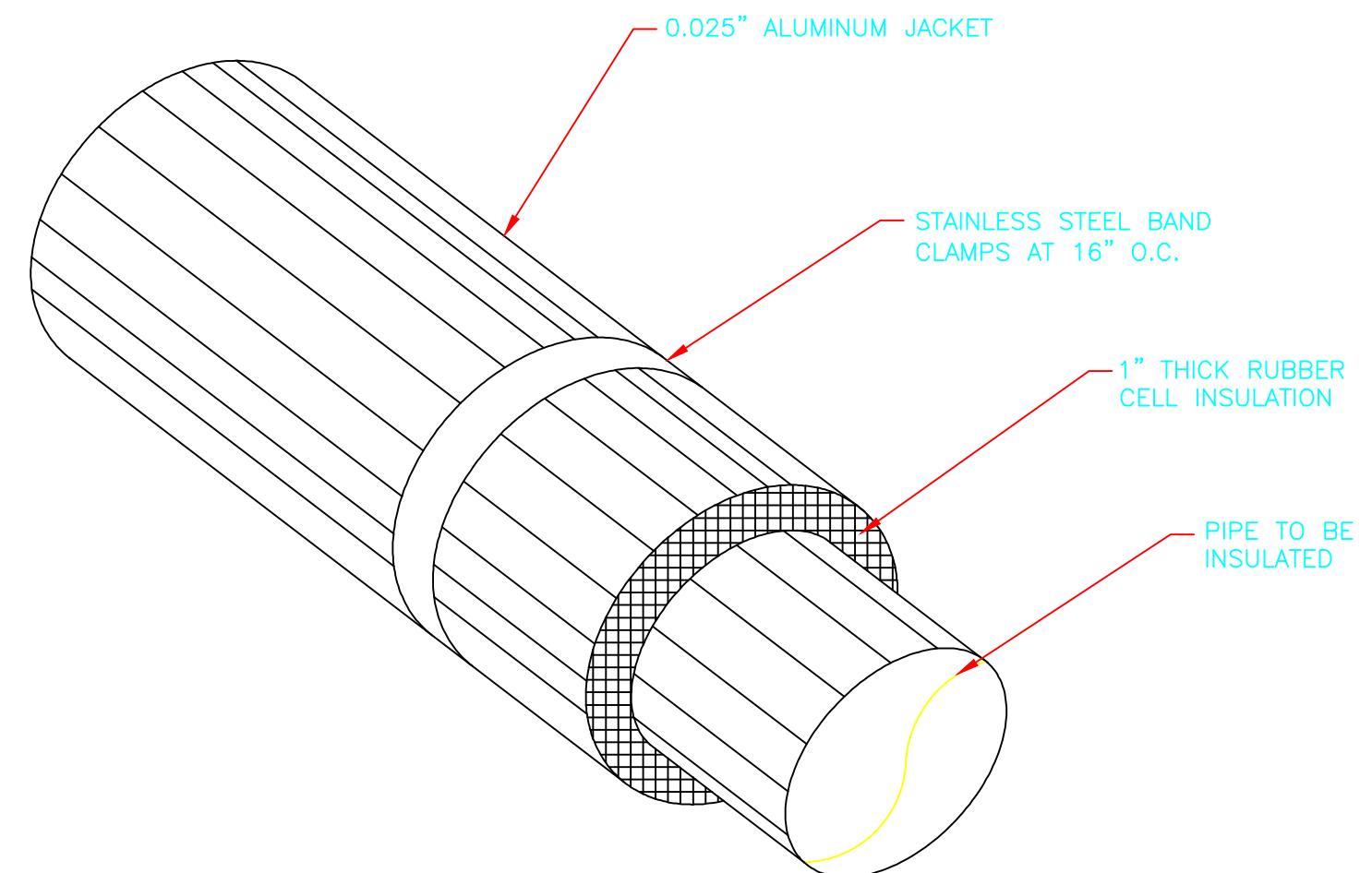


FILTER INFORMATION
 FILTER RATE 1,400 G.P.M.
 TOTAL RATE PER SQ. FT. 3 G.P.M.
 FILTER AREA 480 TOTAL 120 PER CELL
 BACKWASH RATE 15 G.P.M. / SQ. FT.
 BACKWASH RATE 1,800 G.P.M.
 DETENTION TANK APPROX. 30 MIN. 42,000 GAL.

PAINTING SCHEDULE
 1. SEE SPECIFICATION SECTION 09900 FOR ALL FINISHES

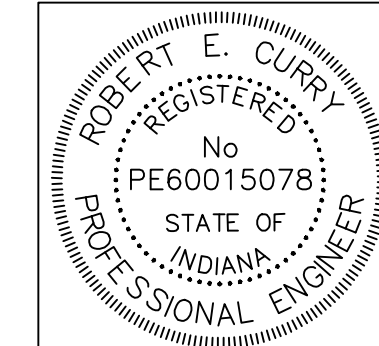
NOTES:
 1. FILTER TO BE SHIPPED AS FOLLOWS
 A. AERATION AND DETENTION SECTION SHIPPED AS TWO SEPARATE UNITS.
 B. FILTER SECTION IS SPLIT IN HALVES AND SHIPPED AS TWO PIECES.
 2. SOME ITEMS HAVE BEEN ROTATED IN THE SECTION VIEW FOR ILLUSTRATION PURPOSES ONLY. THIS SECTION IS NOT AN EXACT CROSS-SECTION @ A SPECIFIC LOCATION, BUT GENERAL IN NATURE

1,400 GPM IRON & MANGANESE REMOVAL UNIT
 2 FLOOR PLAN
 17 SCALE: 3/8" = 1'-0"



3 ALUMINUM INSULATION DETAIL
 17 NO SCALE

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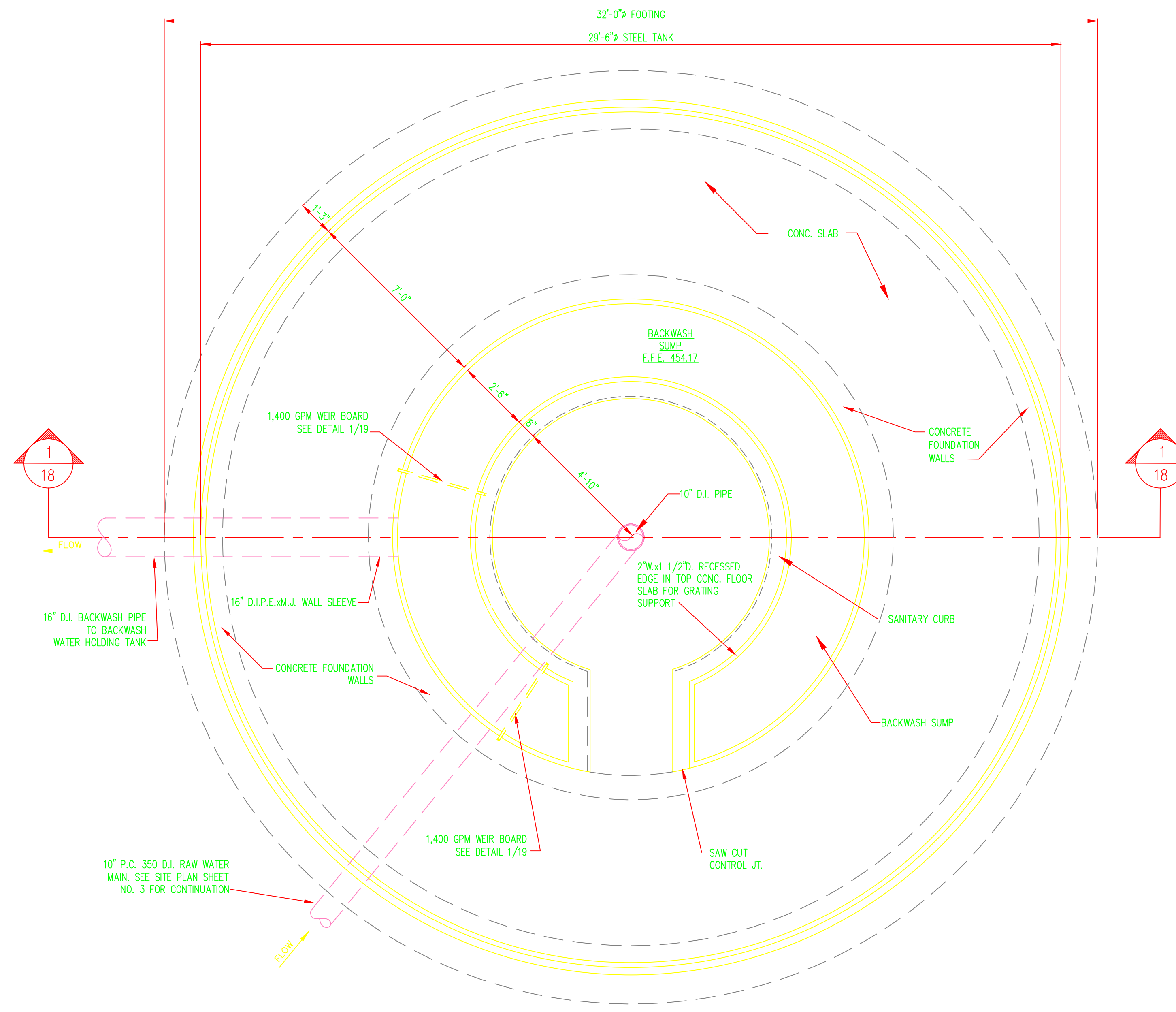


INDIANA DEPARTMENT OF NATURAL RESOURCES
 D.A.P.W. PROJECT NO. E030094

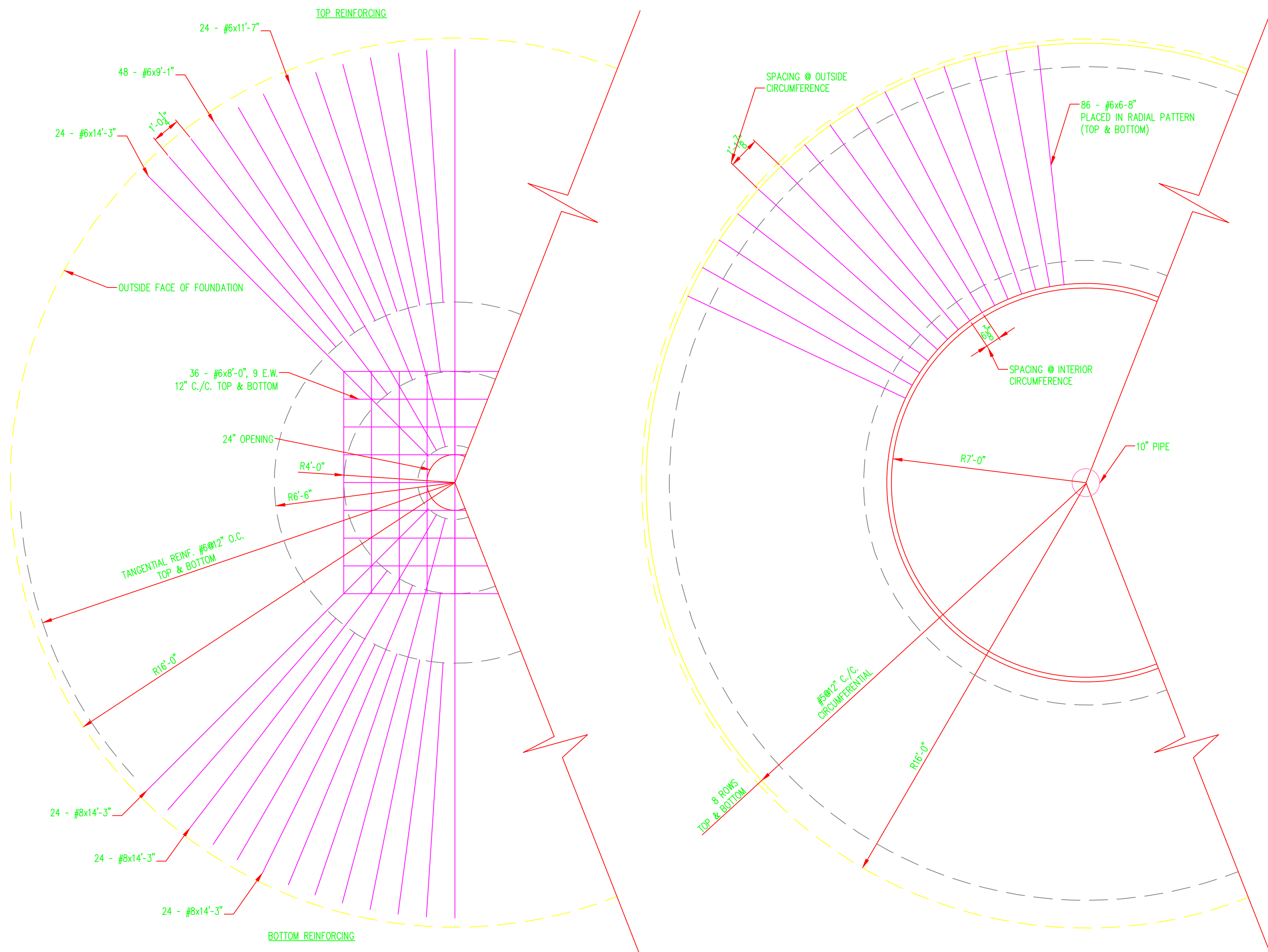
CHARLESTOWN STATE PARK
 WATER SUPPLY IMPROVEMENTS
 DIVISION II—WELLS, WTP & BOOSTER STATION

1,400 GPM IRON & MANGANESE REMOVAL PLANT
 PLAN & SECTION

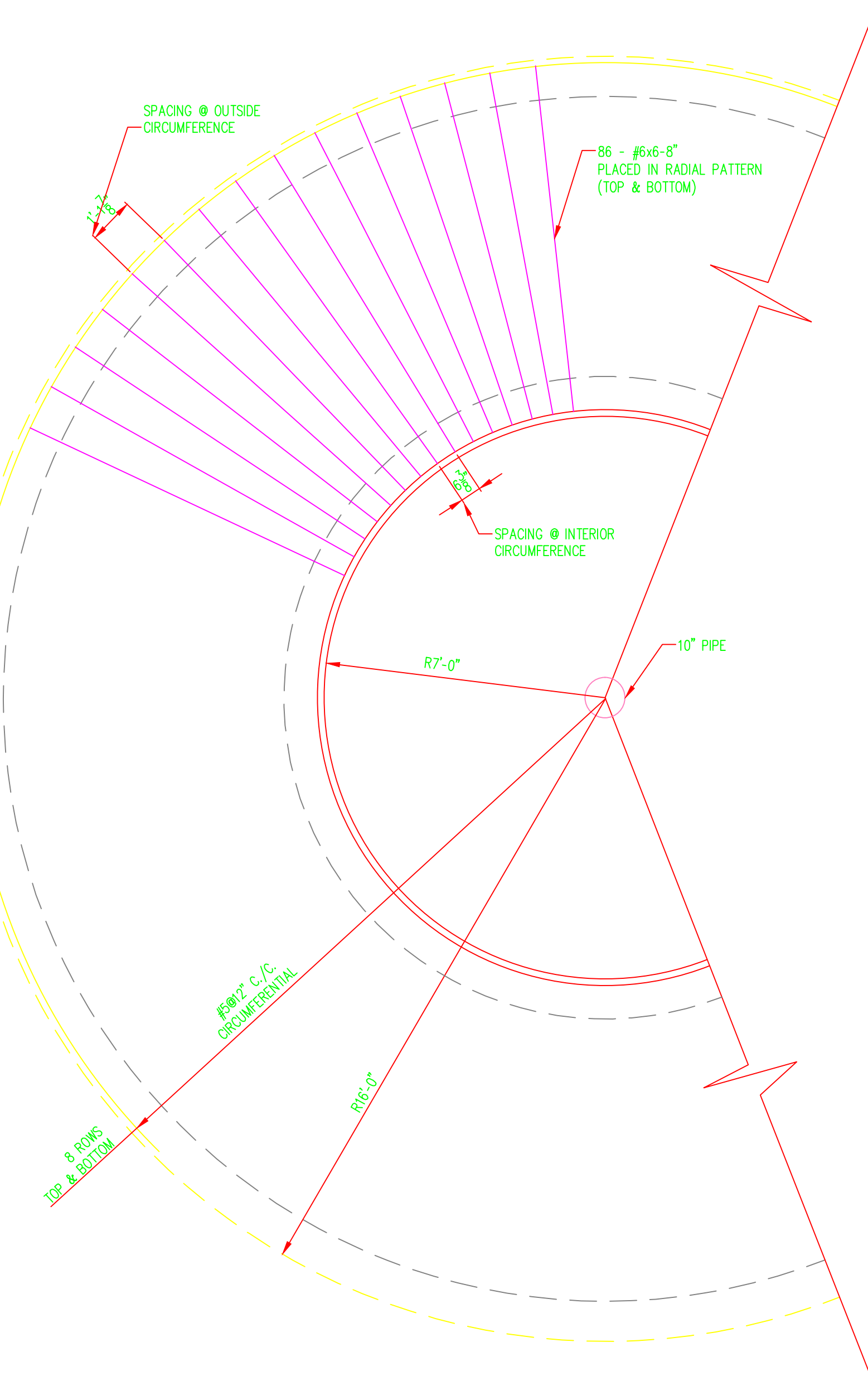
DATE: 11-05-09 APPROVED BY: DRAWING NUMBER: 17 OF 36



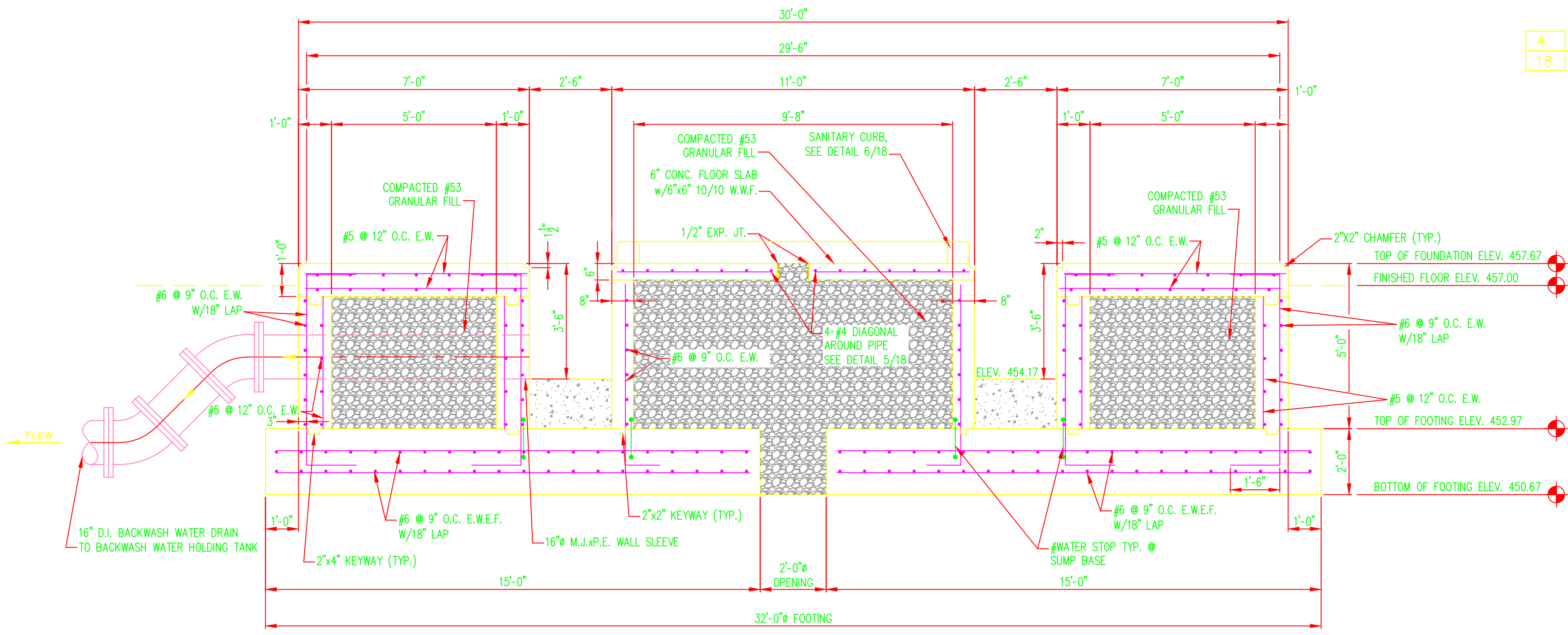
2 1,400 GPM IRON & MANGANESE REMOVAL UNIT
 BASE PLAN
 18 SCALE: 3/8" = 1'-0"



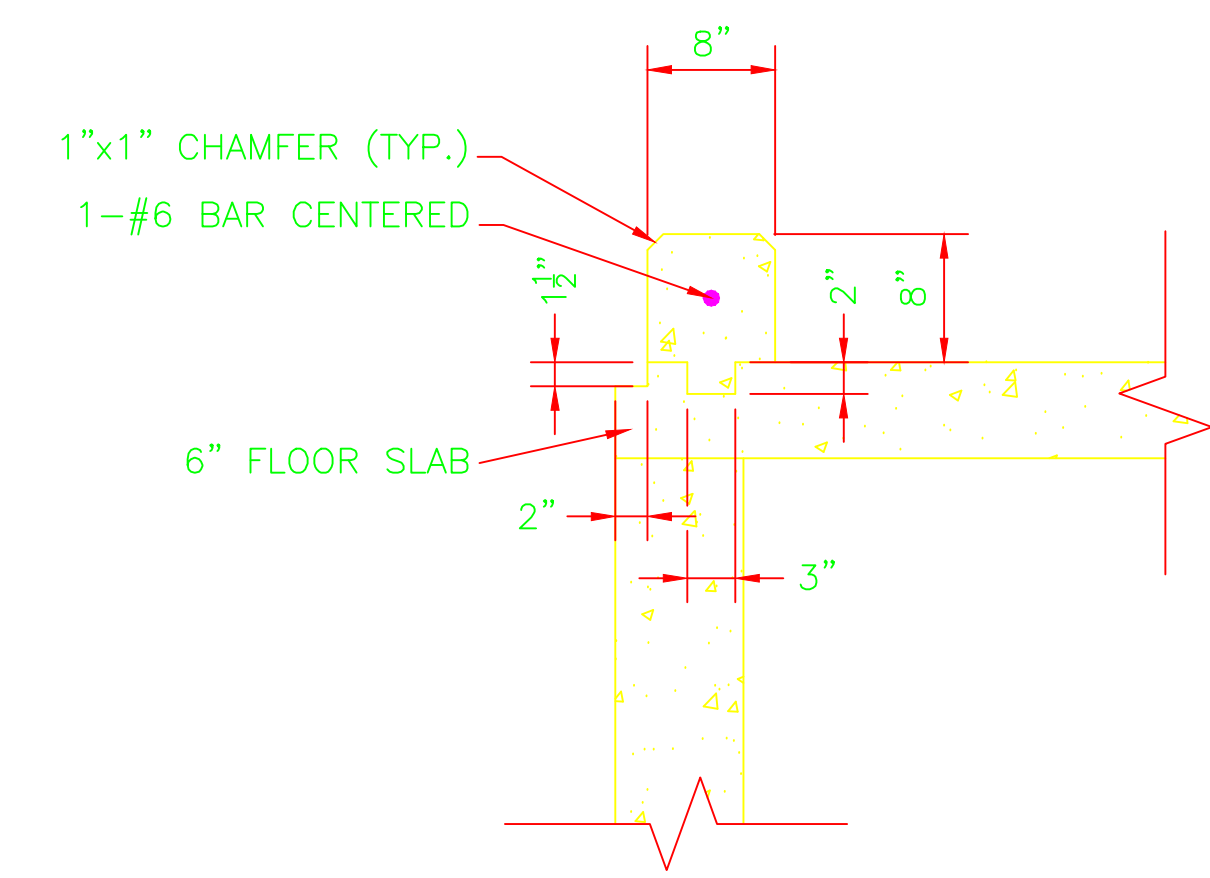
4 1,400 GPM IRON & MANGANESE REMOVAL UNIT
 FOUNDATION REINFORCING PLAN
 18 SCALE: 3/8" = 1'-0"



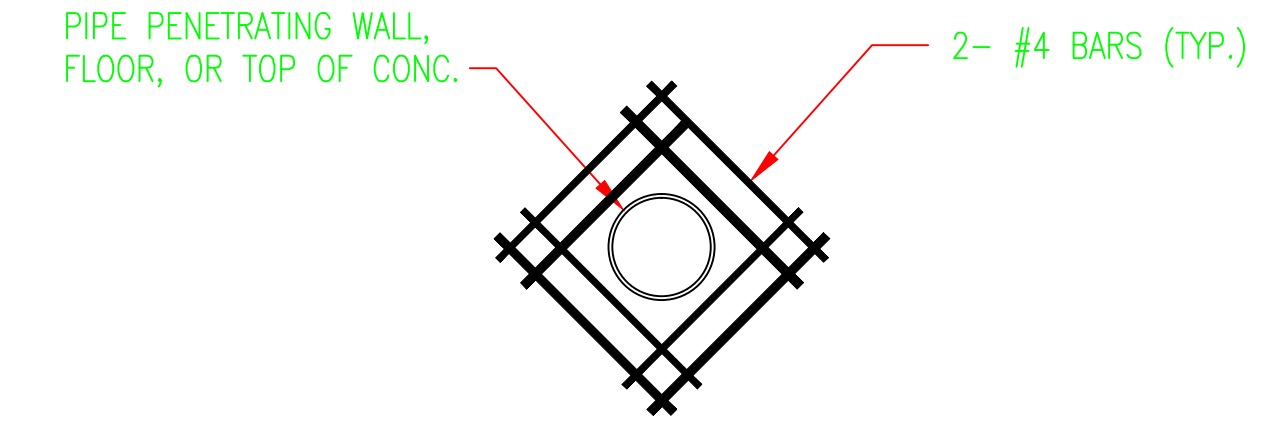
5 1,400 GPM IRON & MANGANESE REMOVAL UNIT
 TOP SLAB PLAN
 18 SCALE: 3/8" = 1'-0"



1 1,400 GPM IRON & MANGANESE REMOVAL UNIT
 CONCRETE BASE SECTION
 18 SCALE: 3/8" = 1'-0"

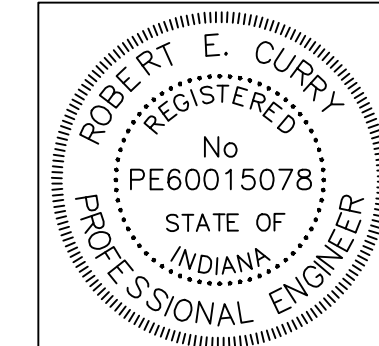


6 8" x 8" SANITARY CURB DETAIL
 18 SCALE: 1" = 1'-0"



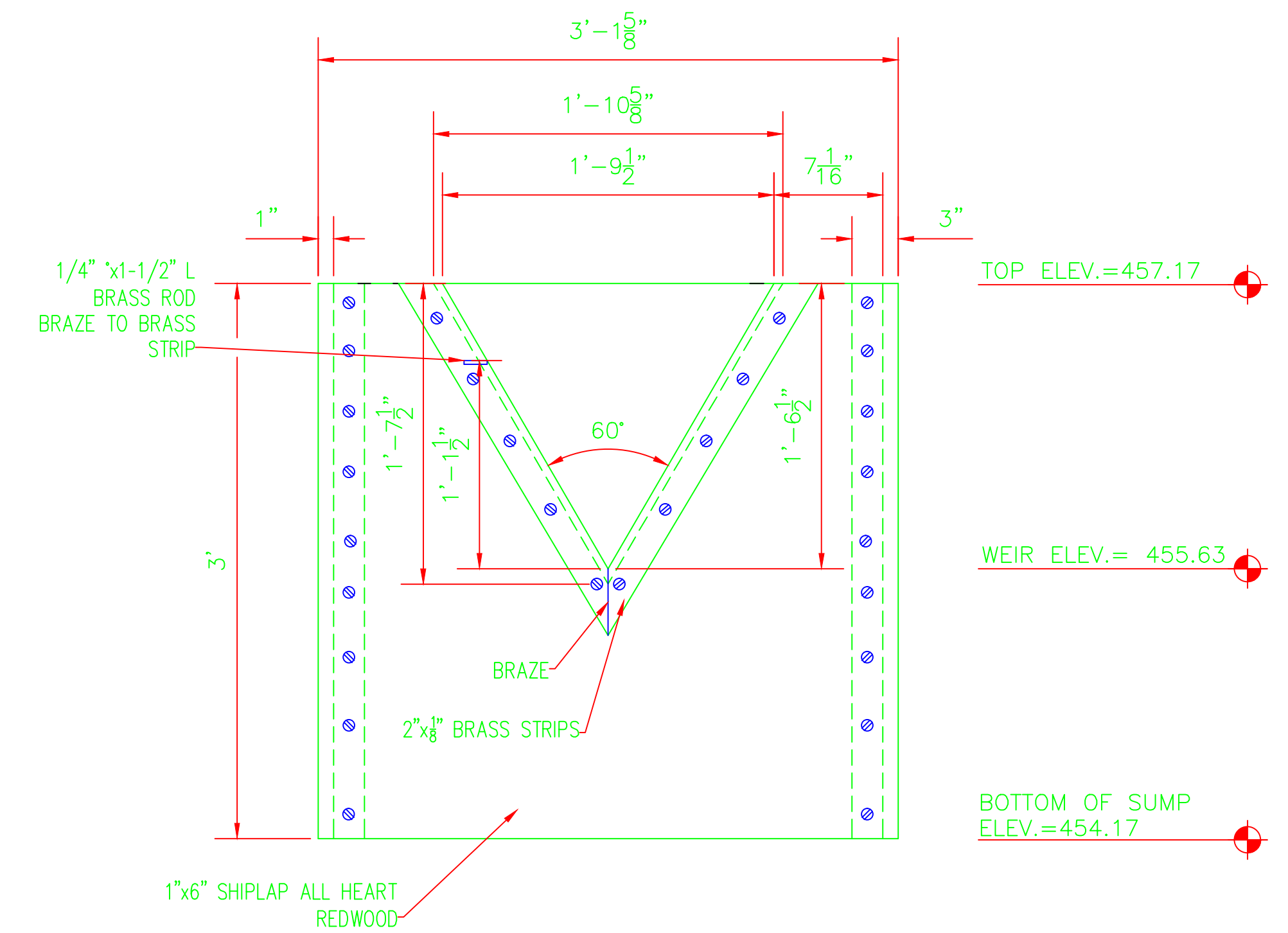
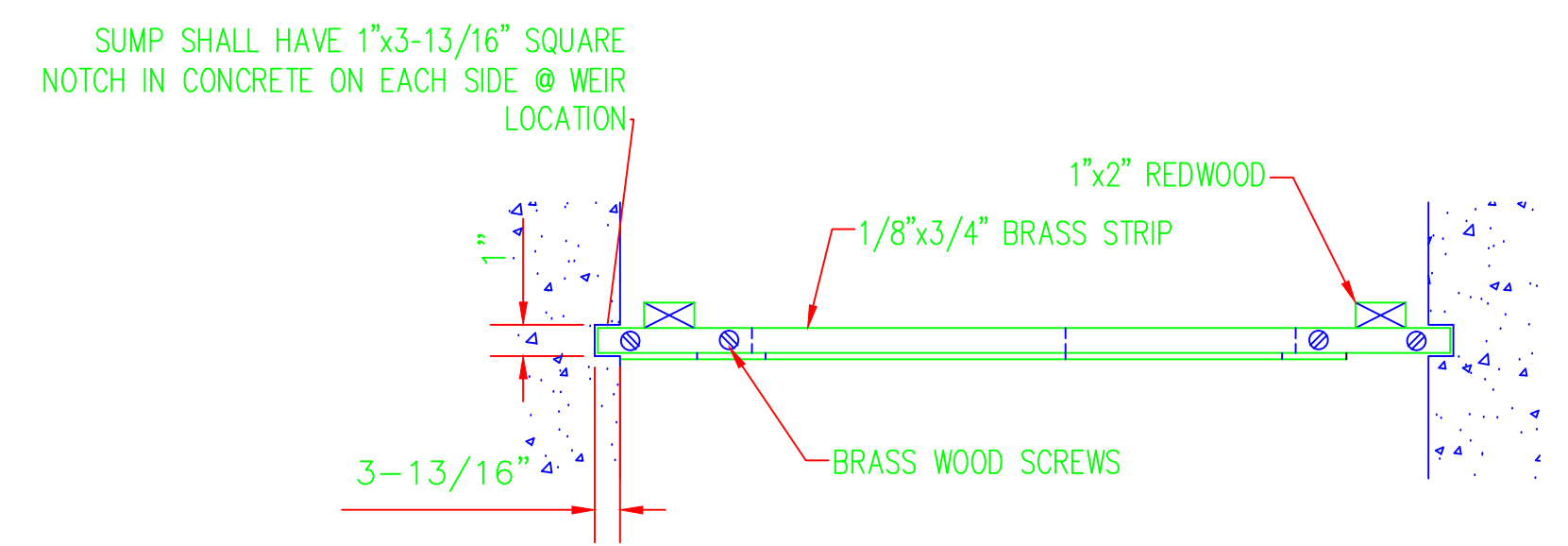
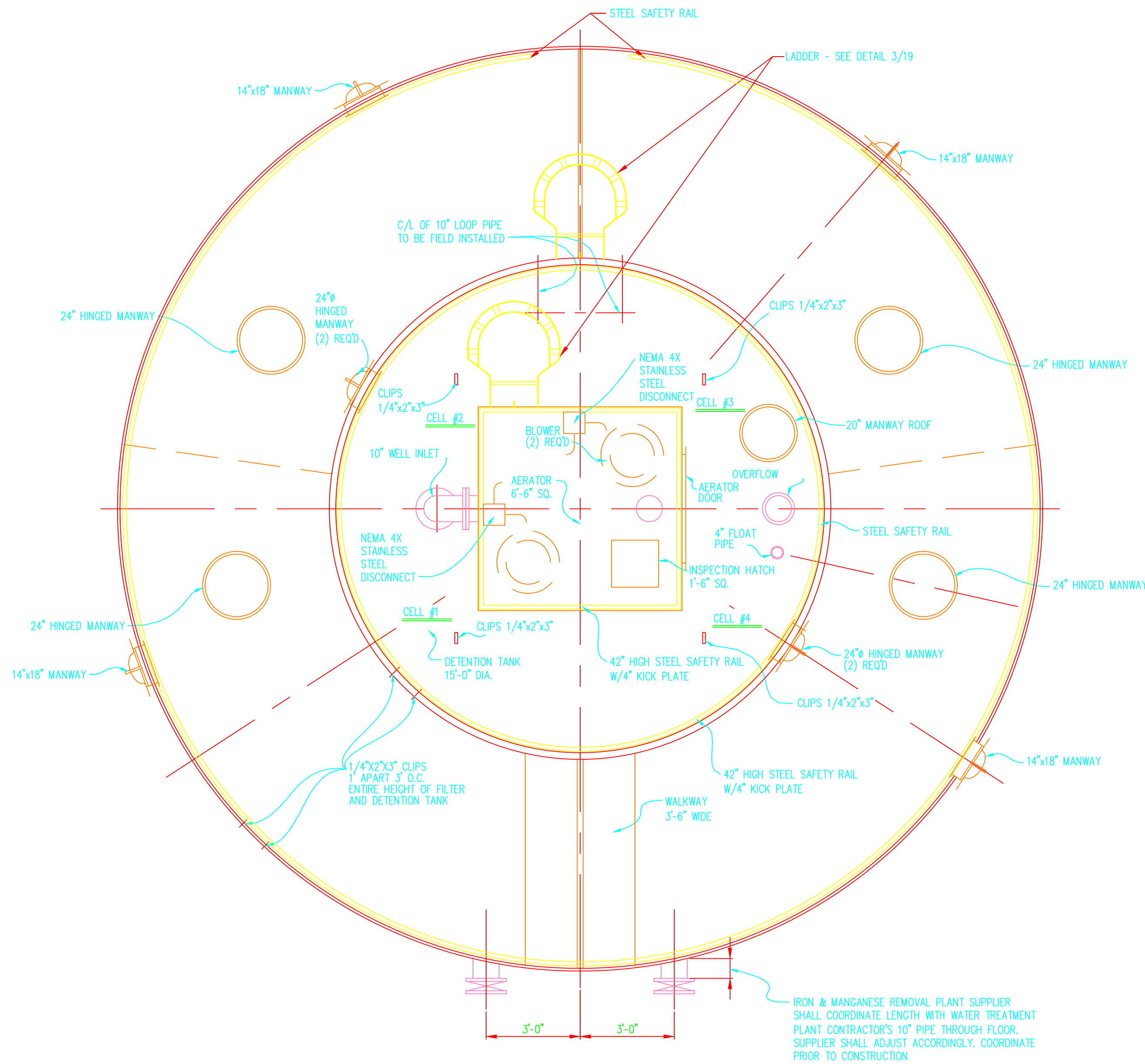
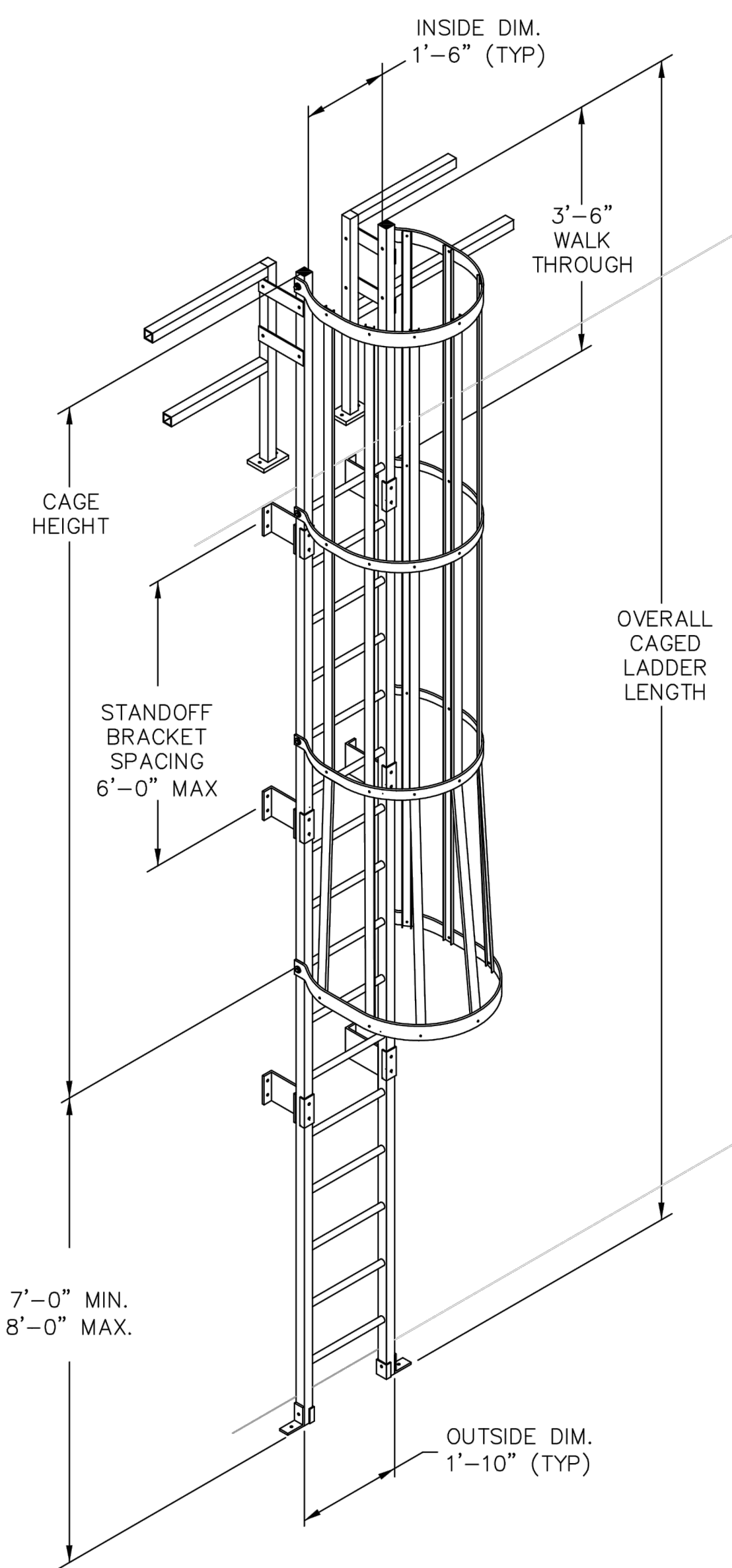
5 CONCRETE REINFORCING AT PIPE PENETRATIONS
 18 SCALE: 3/8" = 1'-0"

Q:\Engineering\Projects\Water\DMR\CHARLESTOWN WATER\Wells, WTP & Booster Station\18 RU Foundation.dwg 3/11/2010 dmark



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INDIANA DEPARTMENT OF NATURAL RESOURCES
 D.A.P.W. PROJECT NO. EO30094
 CHARLESTOWN STATE PARK
 WATER SUPPLY IMPROVEMENTS
 DIVISION II--WELLS, WTP & BOOSTER STATION
 IRON & MANGANESE REMOVAL PLANT
 FOOTING & FOUNDATION DETAILS
 DATE: 11-05-09 APPROVED BY: DRAWING NUMBER: 18 OF 36



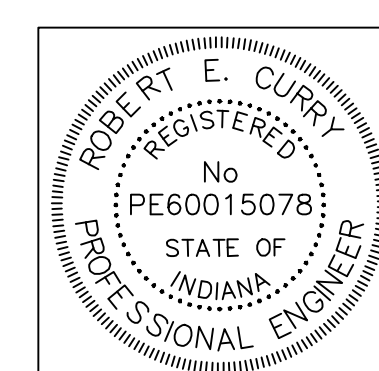
- NOTES:
1. LOWER SECTION OF LADDER SHALL BE FURNISHED LOCKABLE GATE AT BOTTOM OF SAFETY CAGE
 2. LADDER SHALL BE FURNISHED WITH RAIL AND HARNESS FALL ARREST SYSTEM

3	1,400 GPM IRON & MANGANESE REMOVAL UNIT
19	FIBERGLASS LADDER DETAIL
	NO SCALE

2	1,400 GPM IRON & MANGANESE REMOVAL UNIT
19	TOP PLAN
	3/8" = 1'-0"

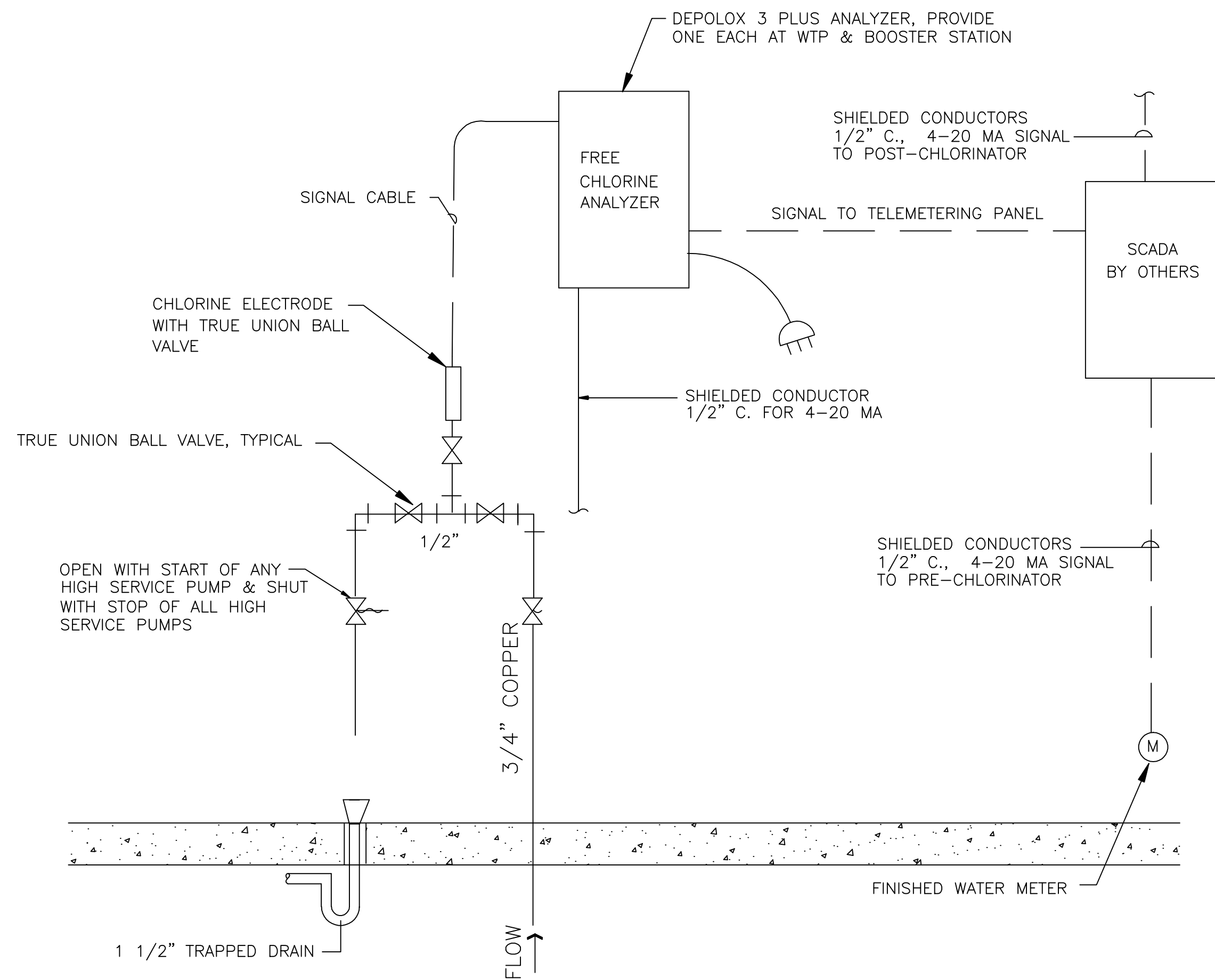
1	1,400 GPM IRON & MANGANESE REMOVAL UNIT
19	1,400 GPM WEIR BOARD FOR BACKWASH SUMP
	3/8" = 1'-0"

Q:\Engineering Projects\Water\CHARLESTOWN WATER\Wells, WTP & Booster Station\19 IRU details.dwg 3/11/2010 dmark

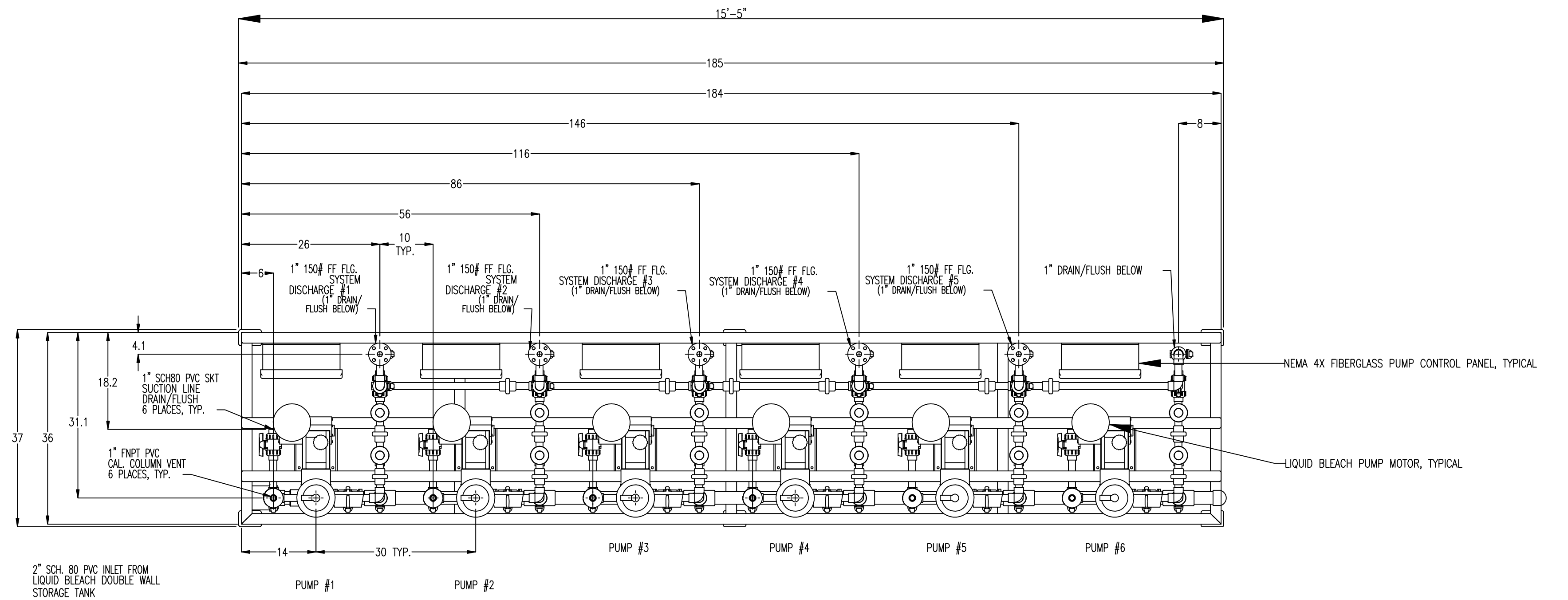


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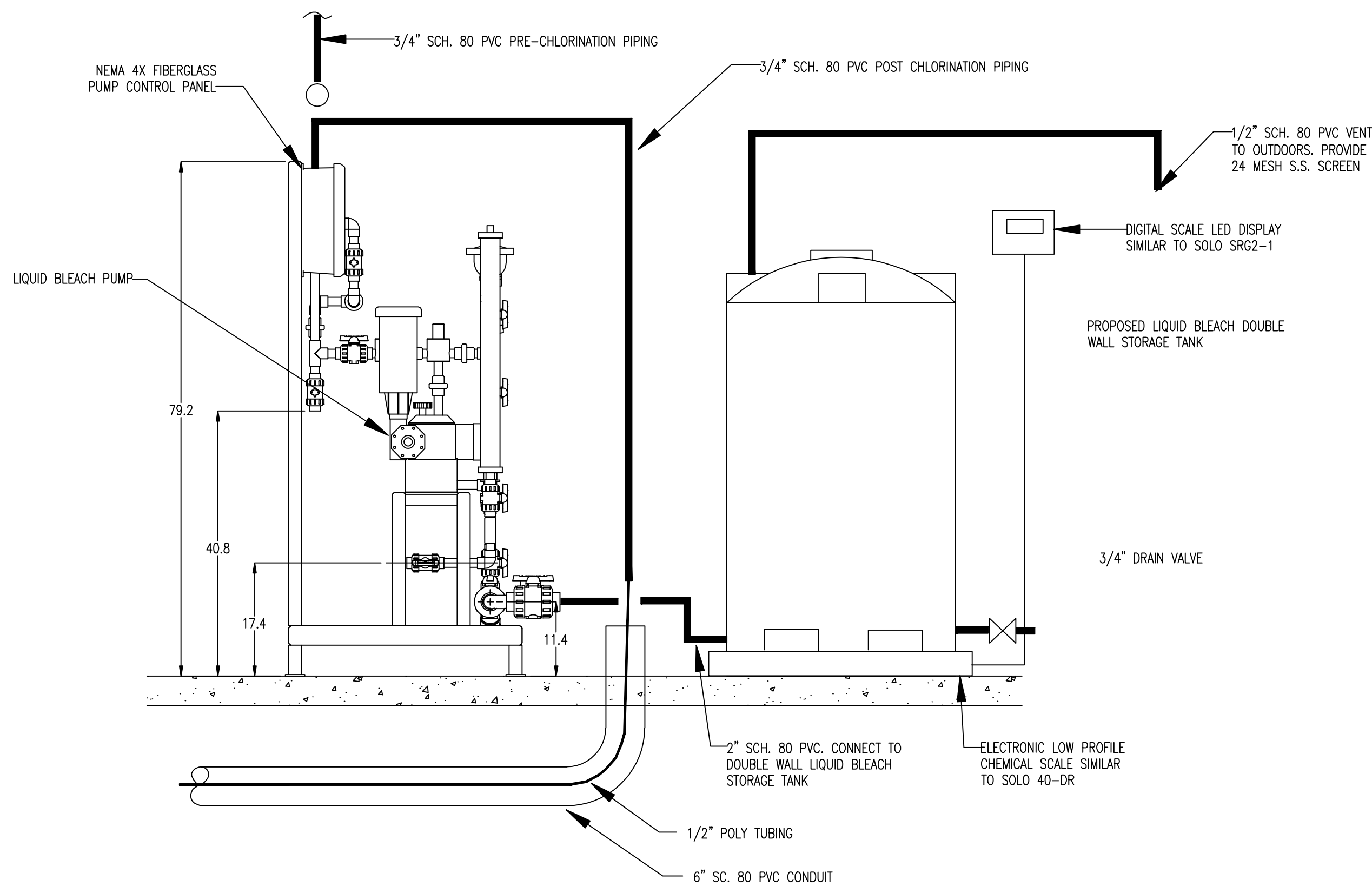
INDIANA DEPARTMENT OF NATURAL RESOURCES D.A.P.W. PROJECT NO. E030094		DRAWN BY:
CHARLESTOWN STATE PARK WATER SUPPLY IMPROVEMENTS DIVISION II—WELLS, WTP & BOOSTER STATION		REVISED:
IRON & MANGANESE REMOVAL PLANT TOP PLAN & DETAILS		
DATE: 11-05-09	APPROVED BY:	DRAWING NUMBER: 19 of 36



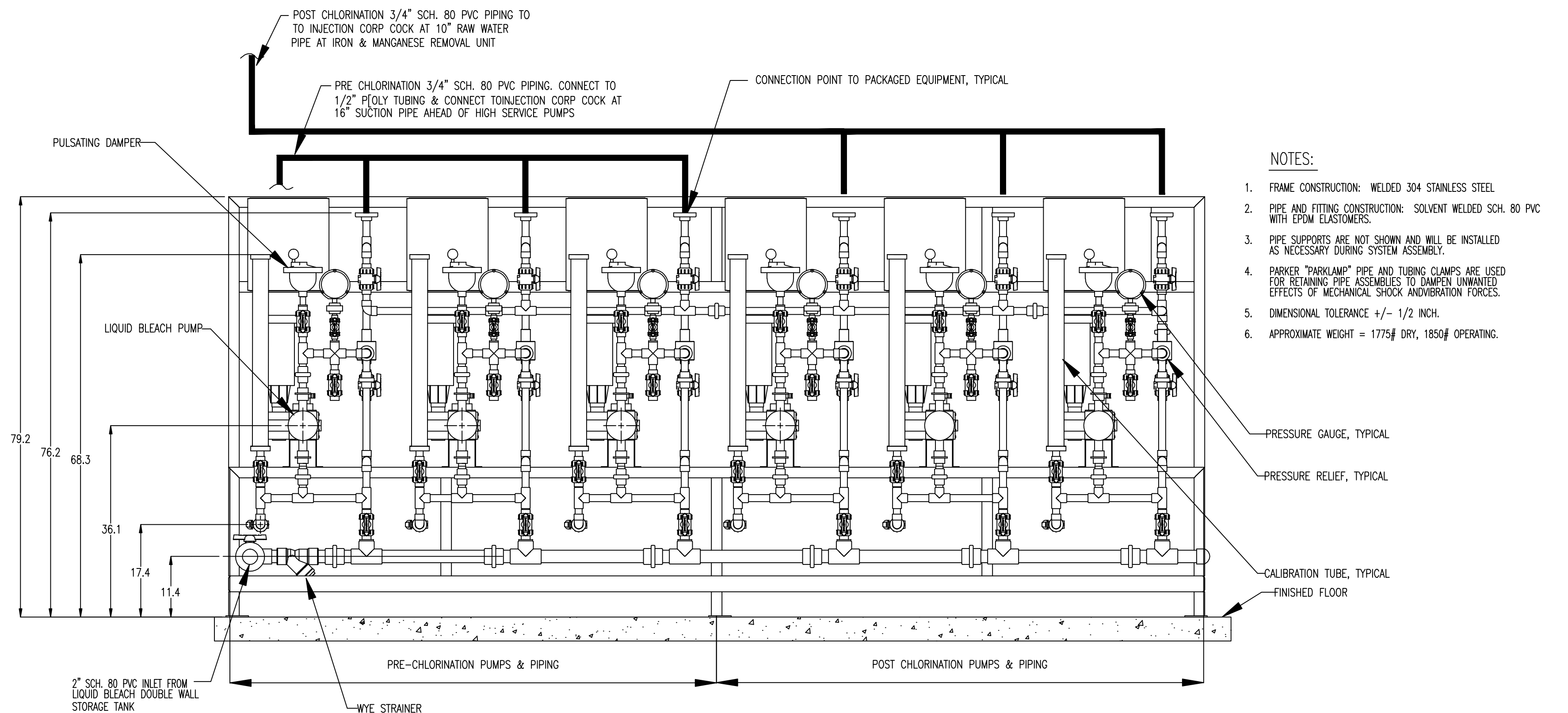
1
20
WATER TREATMENT PLANT & BOOSTER STATION
POST-CHLORINE ANALYZER SCHEMATIC
NO SCALE



2
20
WTP PRE & POST-CHLORINATION
PUMPING & PIPING PLAN
NO SCALE



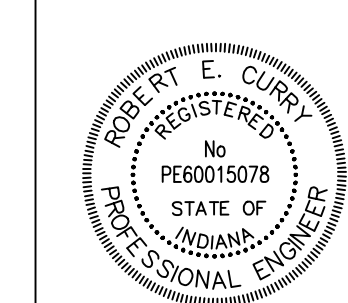
3
20
WTP PRE & POST-CHLORINATION
PUMPING & PIPING LEFT ELEVATION
NO SCALE



4
20
WTP PRE & POST-CHLORINATION
PUMPING & PIPING FRONT ELEVATION
NO SCALE

- NOTES:
1. FRAME CONSTRUCTION: WELDED 304 STAINLESS STEEL
 2. PIPE AND FITTING CONSTRUCTION: SOLVENT WELDED SCH. 80 PVC WITH EPDM ELASTOMERS.
 3. PIPE SUPPORTS ARE NOT SHOWN AND WILL BE INSTALLED AS NECESSARY DURING SYSTEM ASSEMBLY.
 4. PARKER "PARKLAMP" PIPE AND TUBING CLAMPS ARE USED FOR RETAINING PIPE ASSEMBLIES TO DAMPEN UNWANTED EFFECTS OF MECHANICAL SHOCK AND VIBRATION FORCES.
 5. DIMENSIONAL TOLERANCE +/- 1/2 INCH.
 6. APPROXIMATE WEIGHT = 1775# DRY, 1850# OPERATING.

CHEMICAL FEED SYSTEM NOTE:
CONTRACTOR SHALL PROVIDE 3 CHEMICAL FEED TRANSFER PUMPS. PROVIDE ONE EACH FOR LIQUID BLEACH SYSTEM AT WATER TREATMENT PLANT, BOOSTER STATION LIQUID BLEACH SYSTEM AND ONE EACH FOR SODIUM PERMANGANATE. TRANSFER PUMPS SHALL BE SIMILAR TO LUTZ PUMPS, INC. MODEL B28 WITH #41-RSS/HC MMSS-PP TUBE



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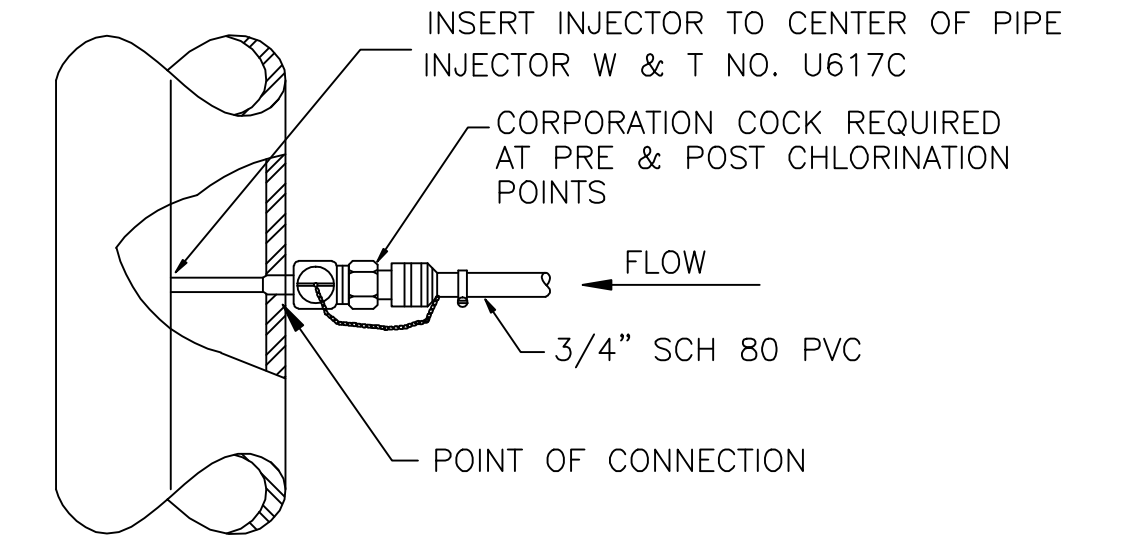
DEPARTMENT OF NATURAL RESOURCES
CHARLESTON STATE PARK

D.A.P.W. PROJECT NO. EO30094
WATERWORKS IMPROVEMENTS
DIVISION II--WELLS, WTP, & BOOSTER STATION

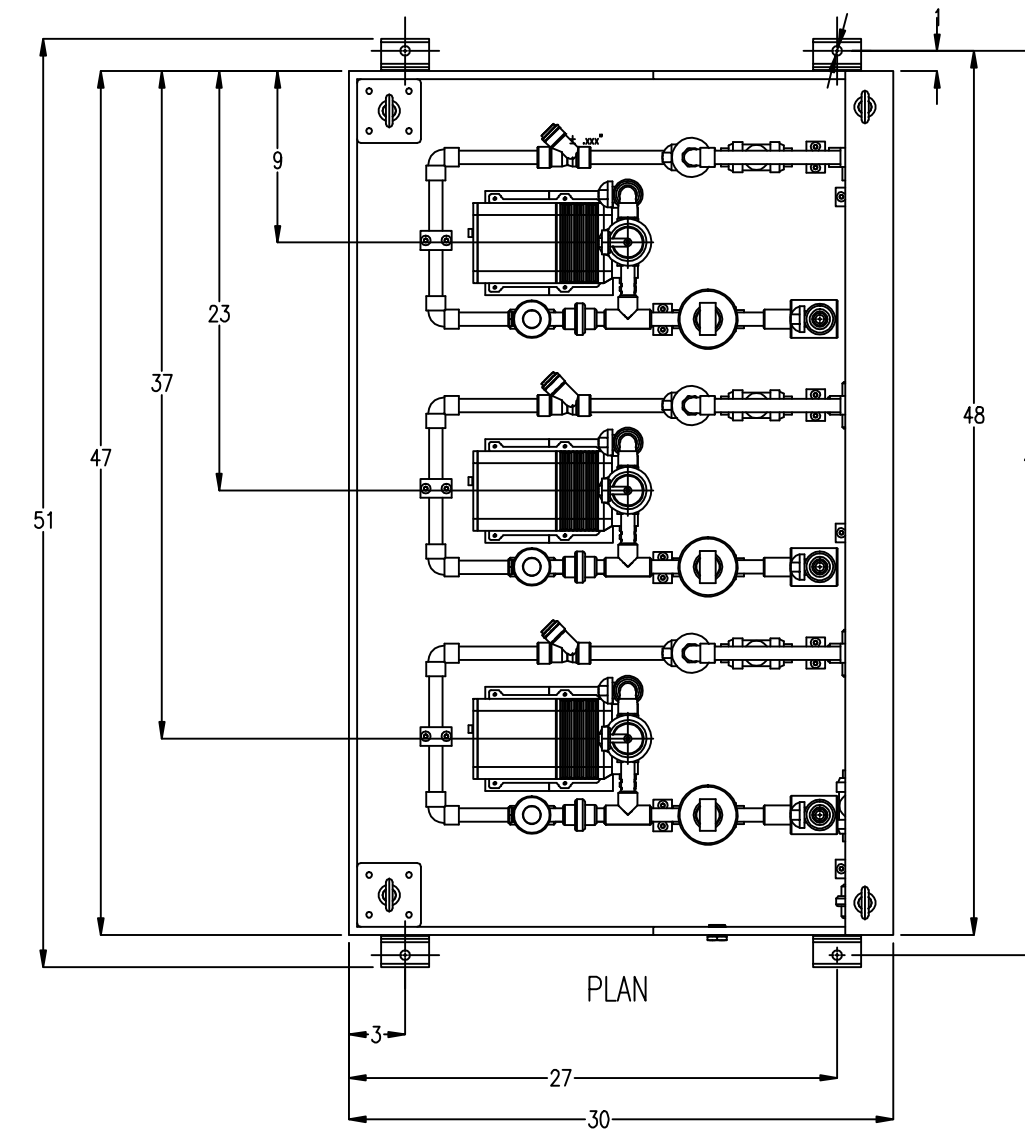
LIQUID BLEACH CHEMICAL FEED SYSTEMS

DATE: NOVEMBER 5, 2009 APPROVED BY: DRAWING NUMBER: 20 of 36

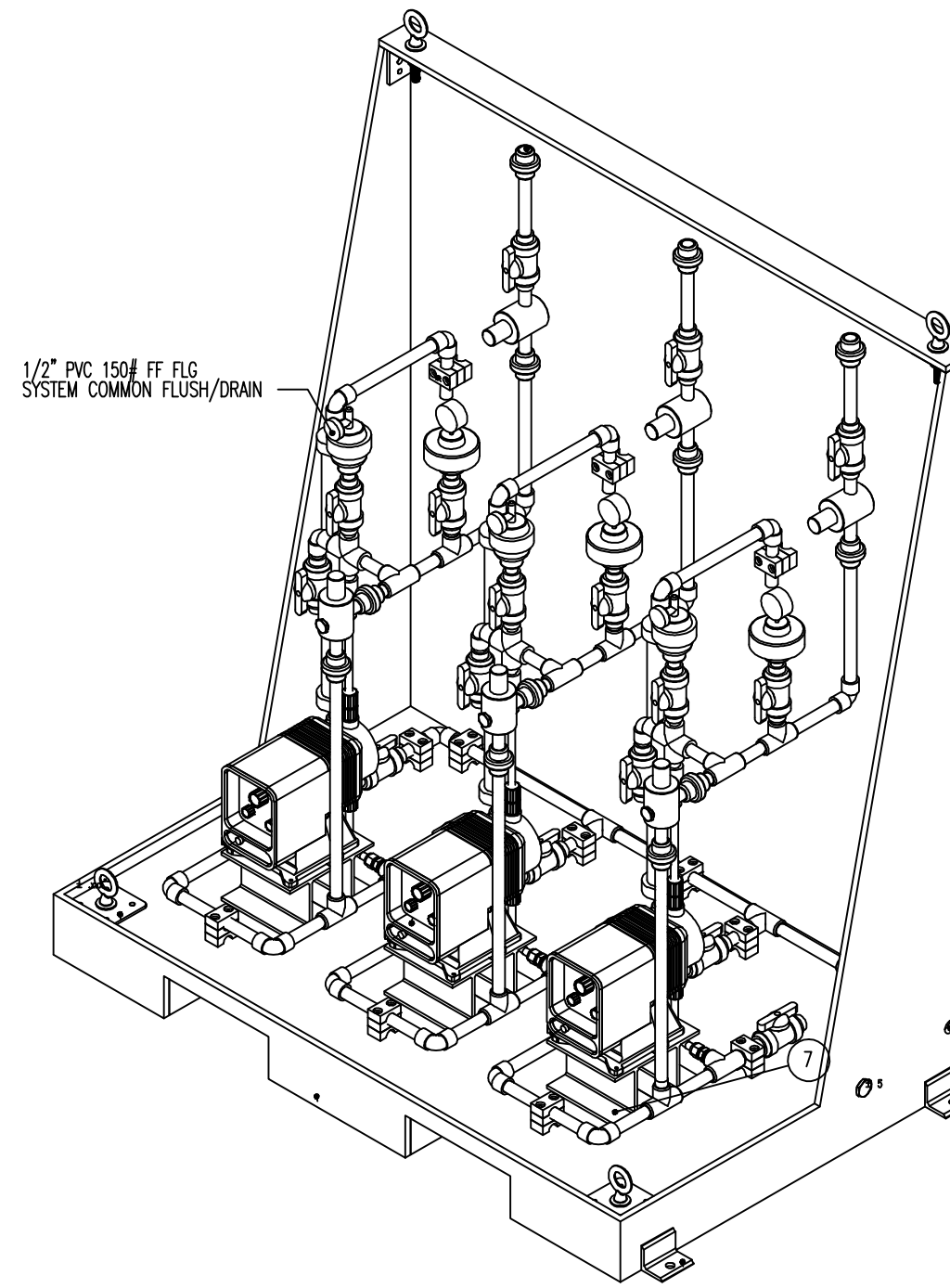
NOTE:
CORPORATION COCK DETAIL TYPICAL FOR ALL
CHEMICAL INJECTION POINTS INCLUDING
LIQUID BLEACH, SODIUM PERMANGANATE &
FLUORIDE



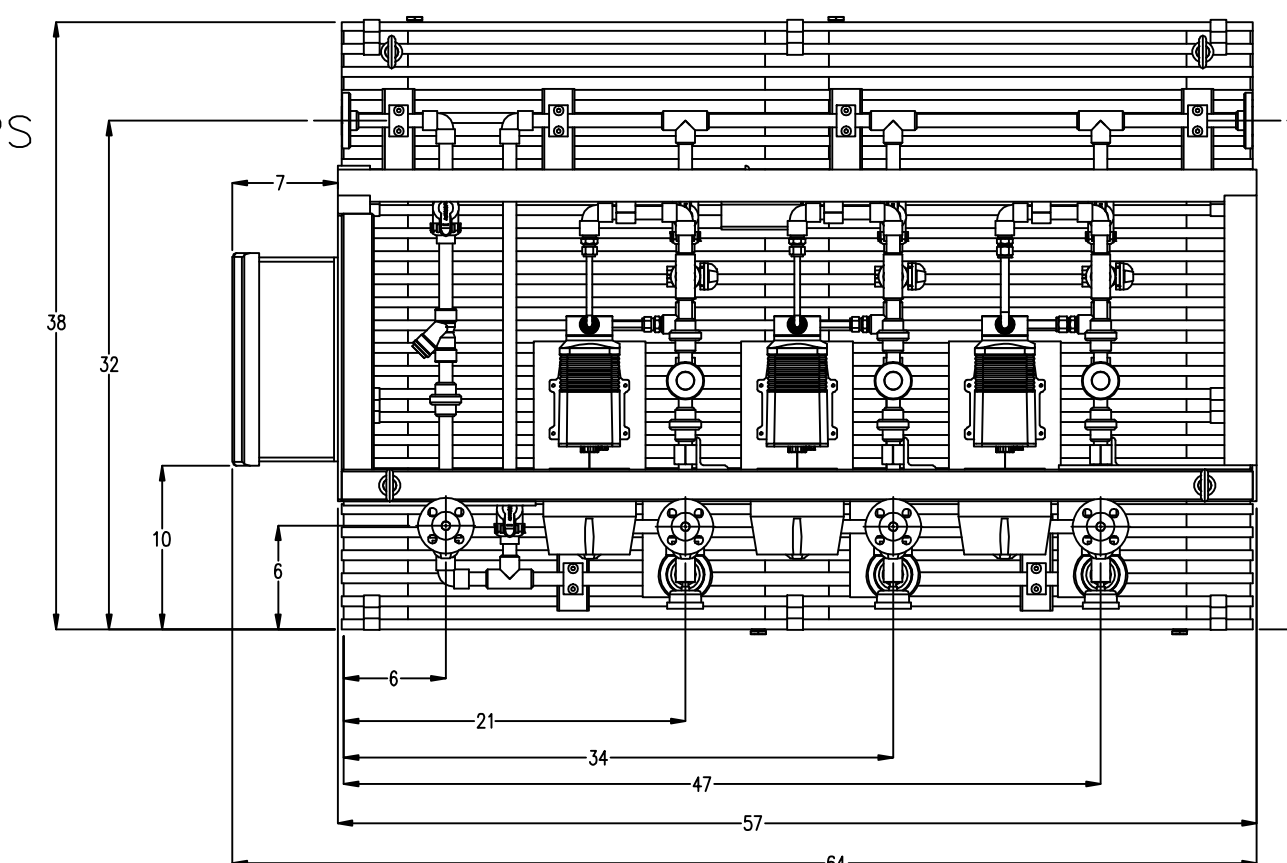
2 CORPORATION COCK DETAIL
21 NO SCALE



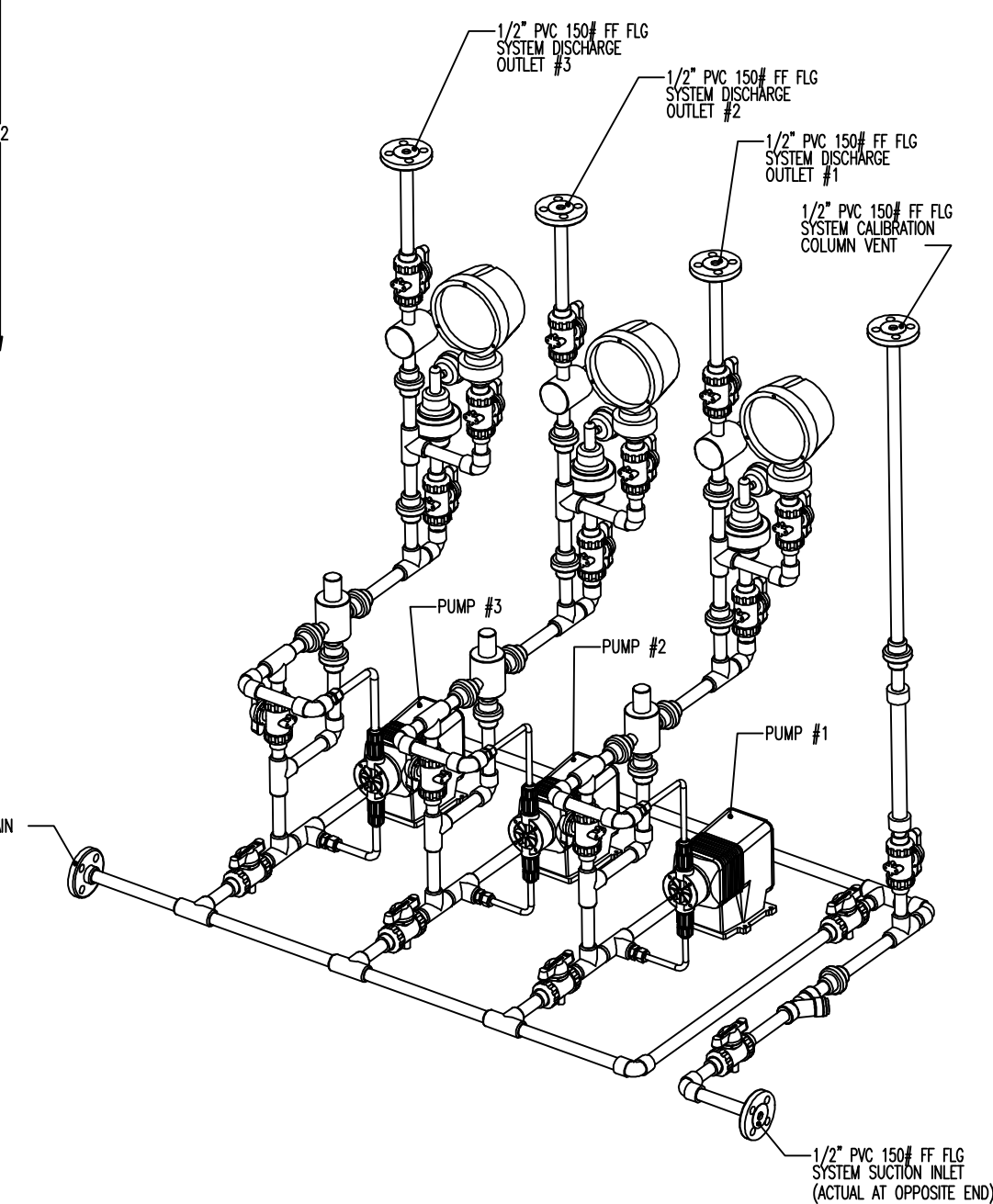
5 SODIUM PERMANGANATE PUMPS
& PIPING PLAN
21 NO SCALE



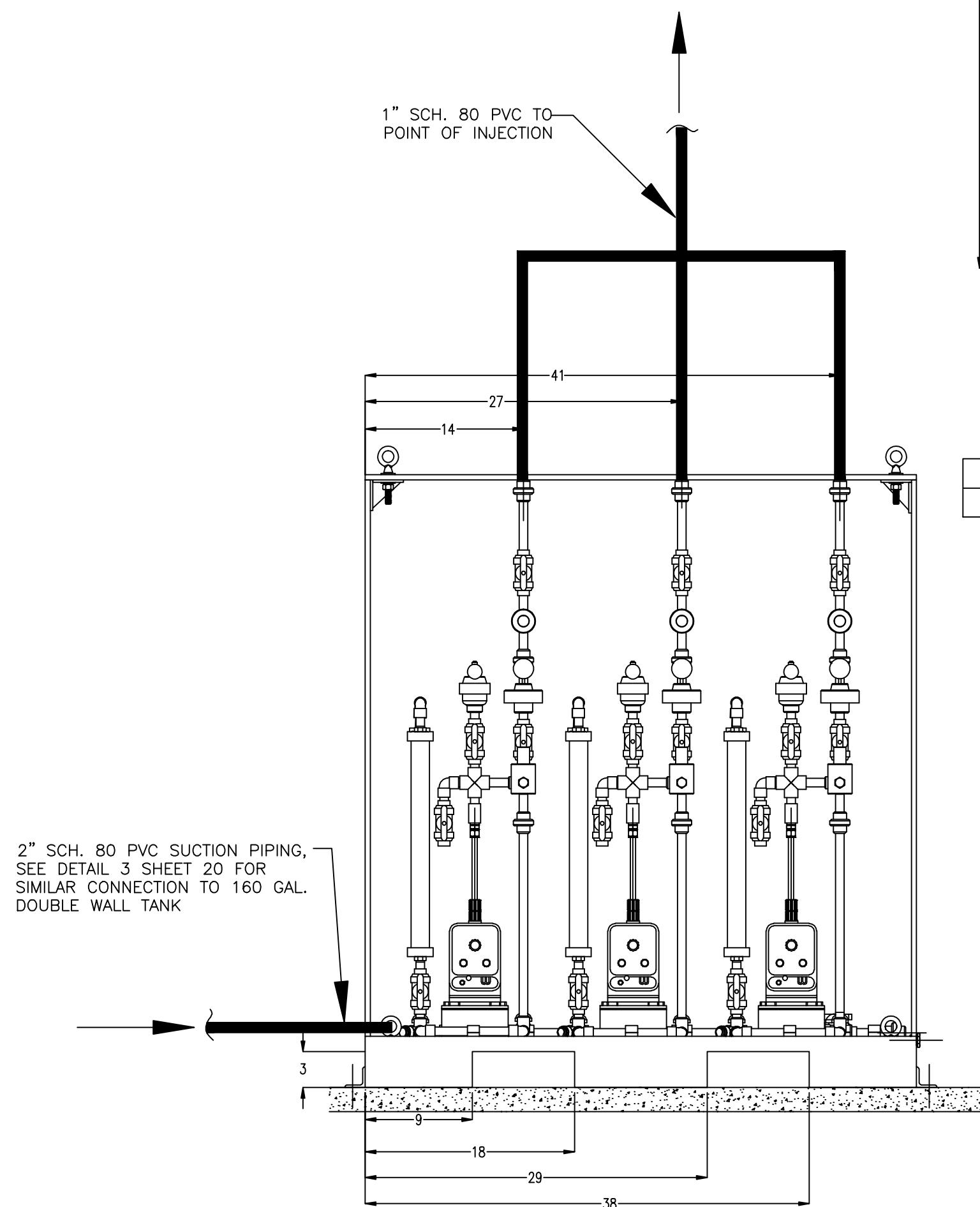
8 SODIUM PERMANGANATE PUMPS
& PIPING ISOMETRIC
21 NO SCALE



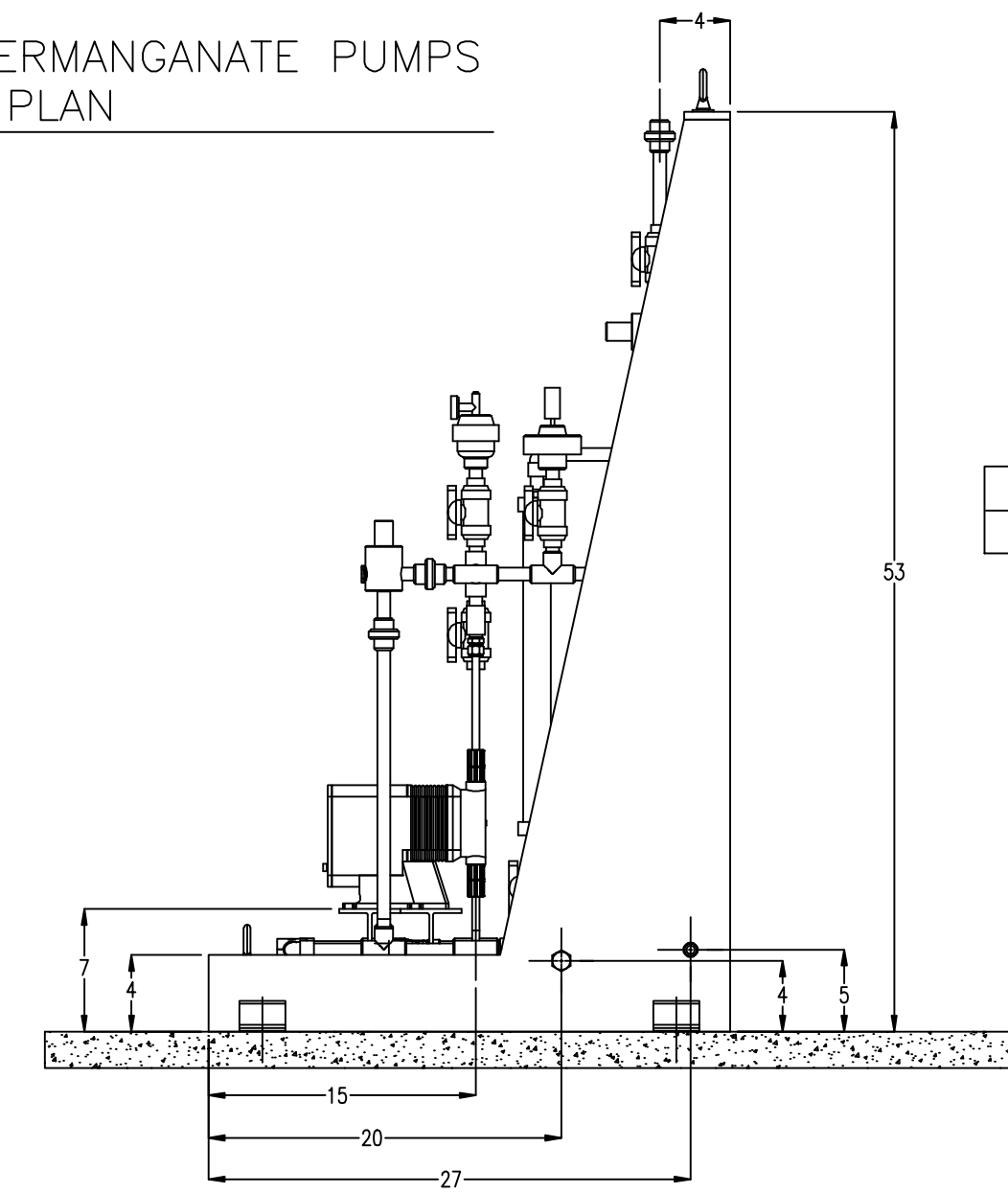
3 FLUORIDE PUMPS & PIPING PLAN
21 NO SCALE



9 FLUORIDE PUMPS & PIPING ISOMETRIC
21 NO SCALE

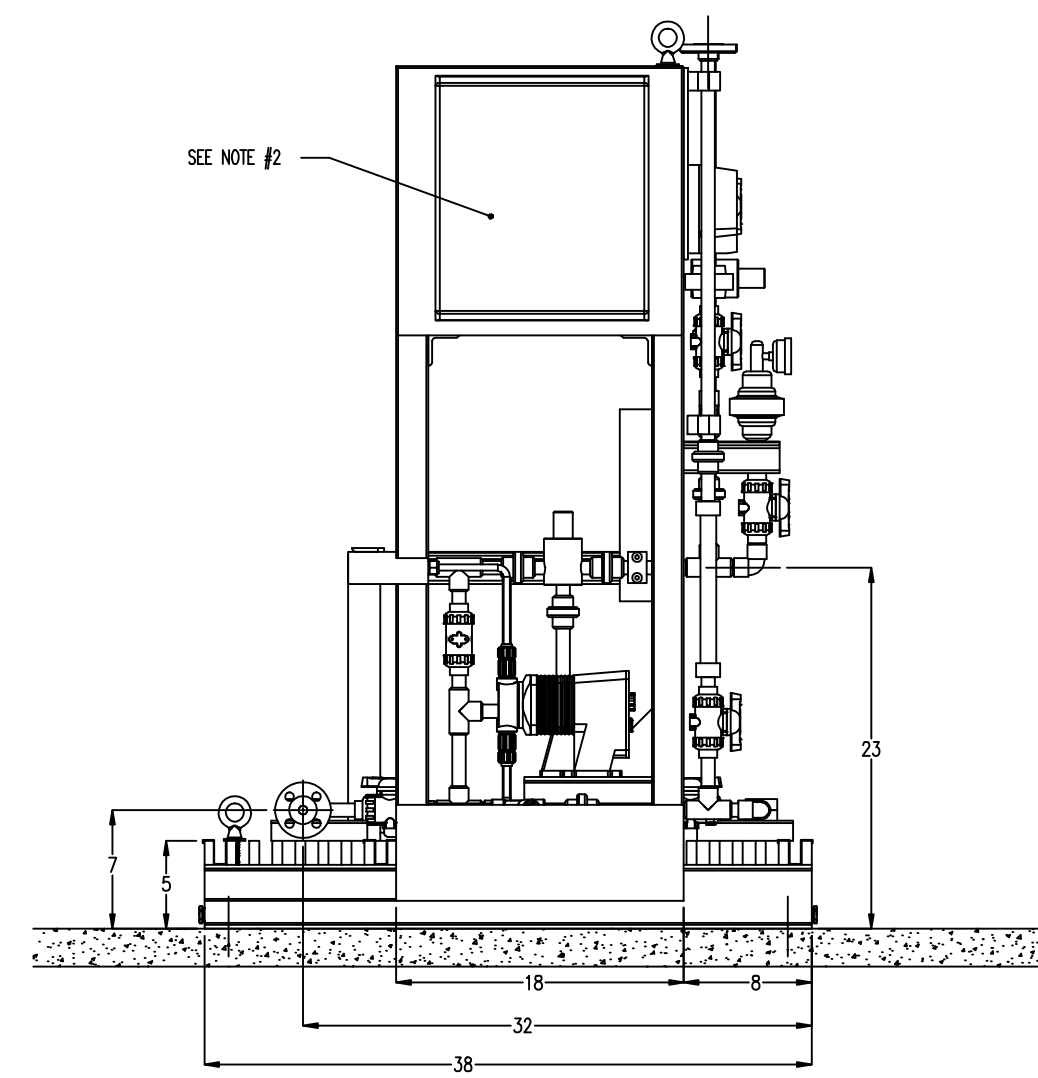


6 SODIUM PERMANGANATE PUMPS
& PIPING FRONT ELEVATION
21 NO SCALE

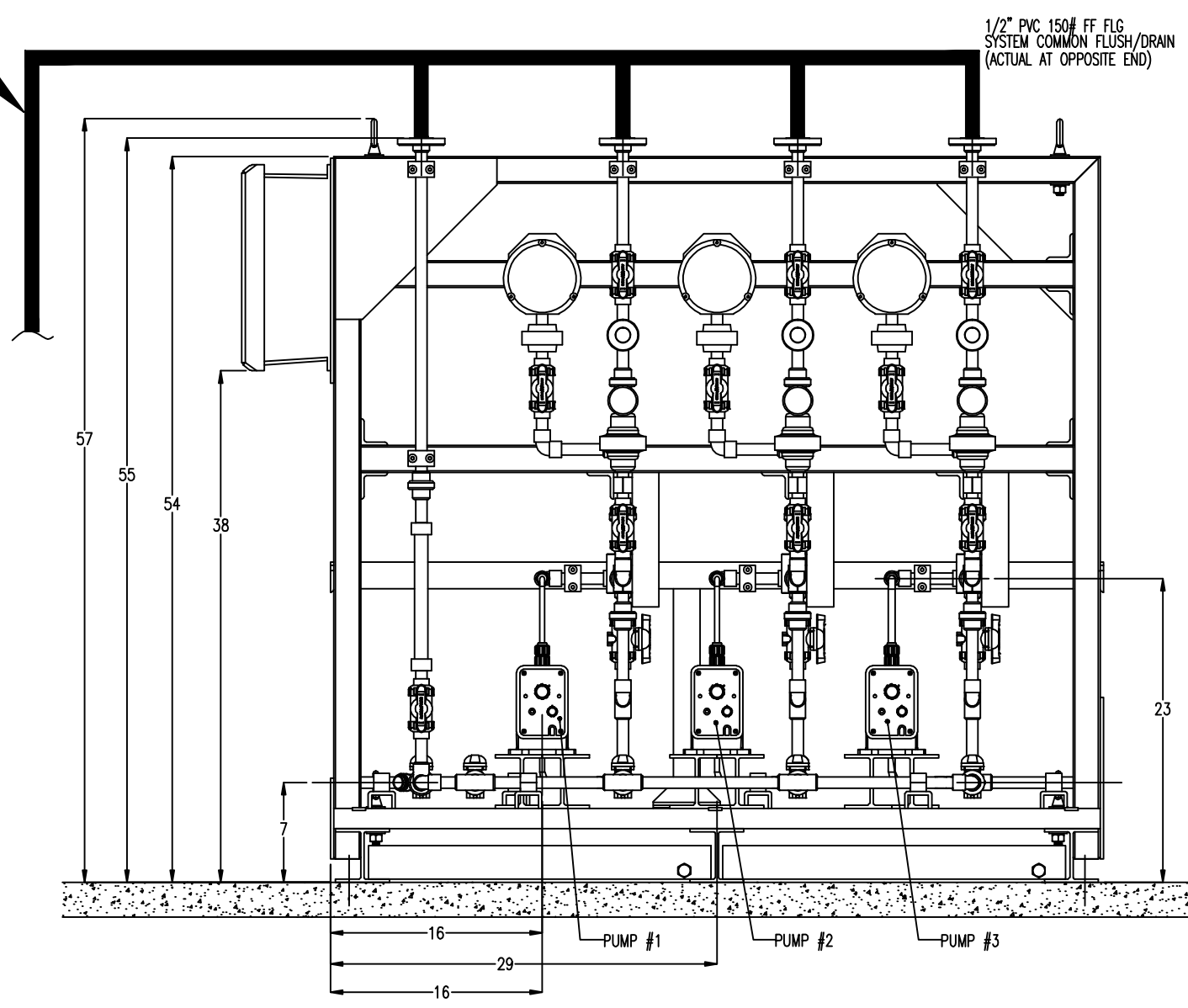


7 SODIUM PERMANGANATE PUMPS
& PIPING FRONT ELEVATION
21 NO SCALE

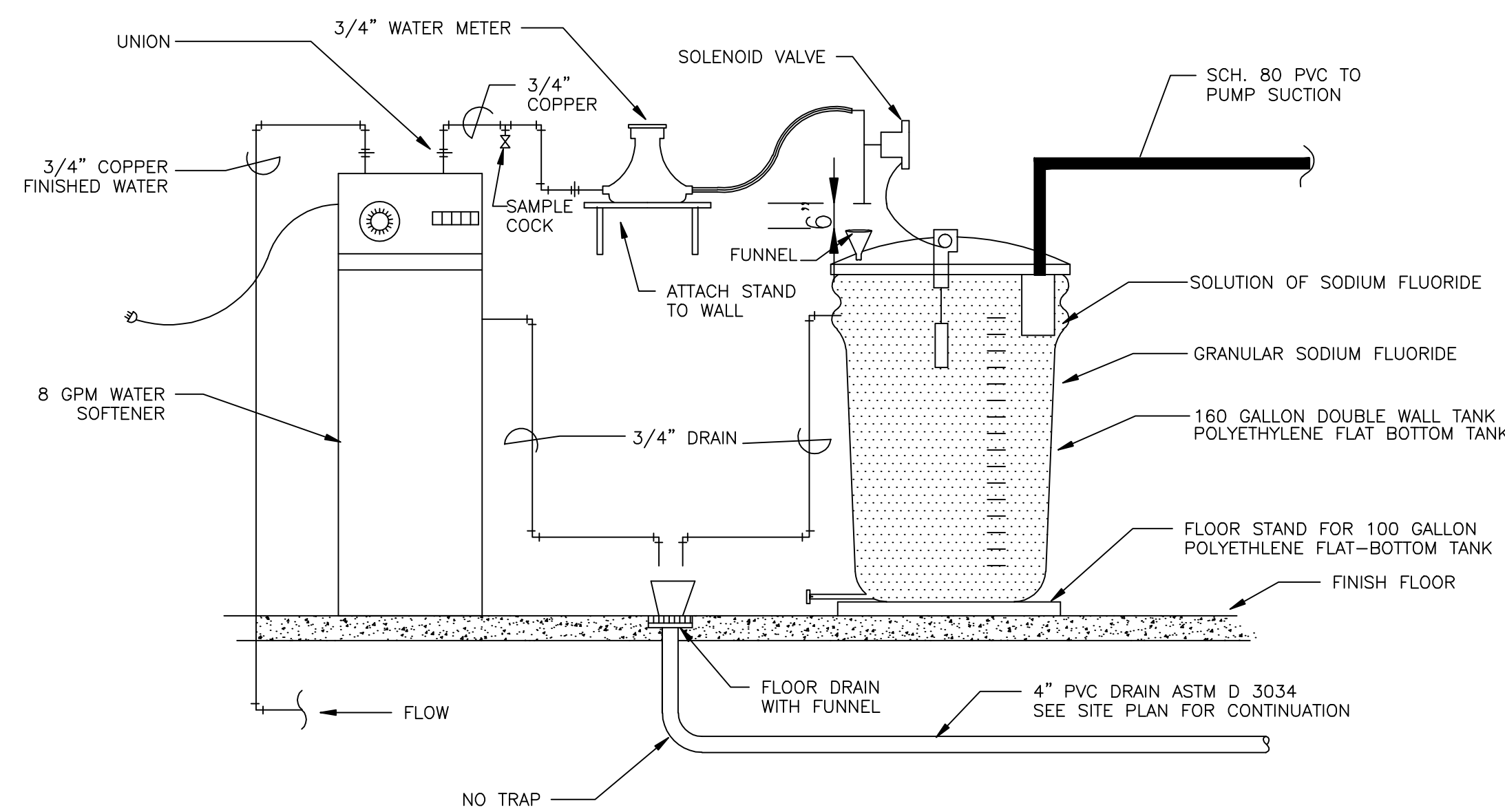
1\"/>



4 FLUORIDE PUMPS &
PIPING LEFT ELEVATION
21 NO SCALE

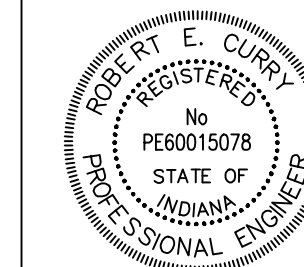


1 FLUORIDE PUMPS &
PIPING FRONT ELEVATION
21 NO SCALE

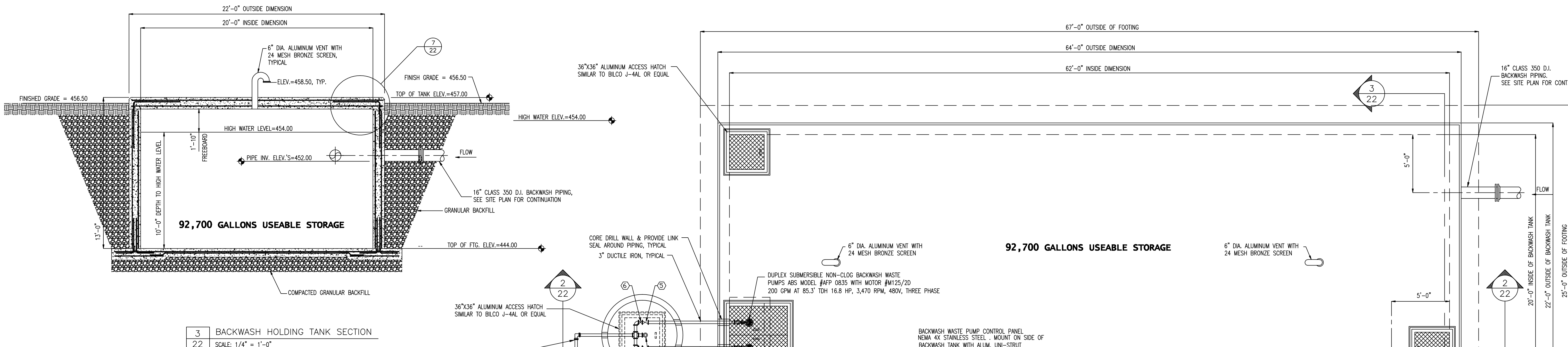


5 FLUORIDE SATURATOR DETAIL
21 NO SCALE

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DEPARTMENT OF NATURAL RESOURCES CHARLESTON STATE PARK	
D.A.P.W. PROJECT NO. E030094 WATERWORKS IMPROVEMENTS DIVISION II--WELLS, WTP, & BOOSTER STATION	DRAWN BY: REVISED:
SODIUM PERMANGANATE & FLUORIDE CHEMICAL FEED SYSTEMS	
DATE: NOVEMBER 5, 2009	APPROVED BY: DRAWING NUMBER: 21 OF 36

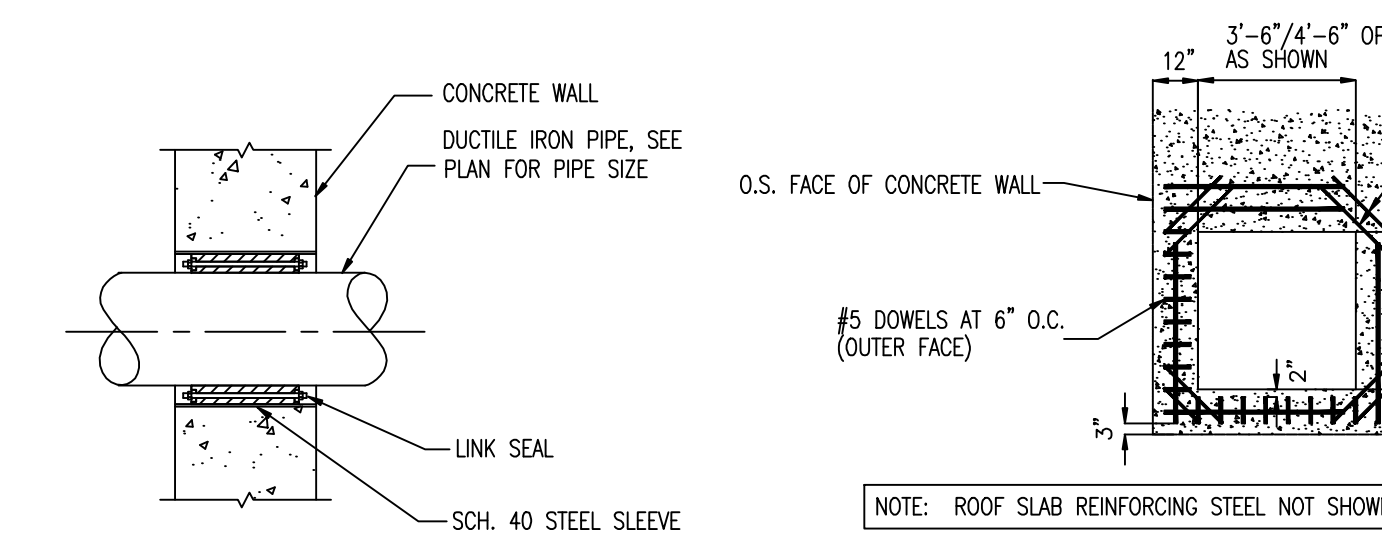


3 BACKWASH HOLDING TANK SECTION
SCALE: 1/4" = 1'-0"

1 BACKWASH HOLDING TANK PLAN
SCALE: 1/4" = 1'-0"

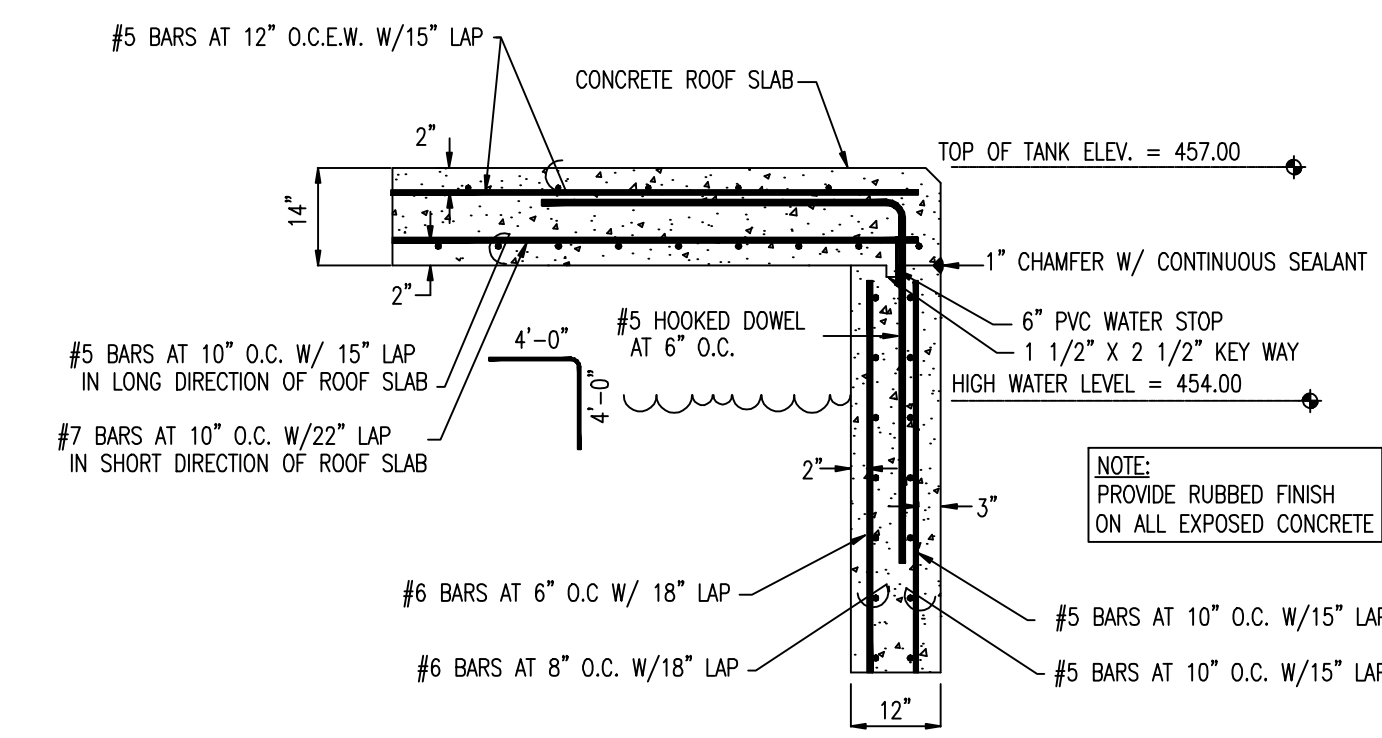
BACKWASH WASTE RETURN PUMPS			
DESCRIPTION	DESIGN	DESCRIPTION	DESIGN
AVERAGE FLOW RATE (GPM)	100	CHECK VALVE SIZE	4"
BACKWASH 4 CELLS - GALLONS	54,000	PLUG VALVE SIZE	4"
FORCE MAIN DIAMETER	4"	VALVE VAULT INSIDE DIAMETER	6" DIA.
EQUV. FORCE MAIN LENGTH (FT.)	160	VALVE VAULT DEPTH	10'-6"
FORCE MAIN VELOCITY (FT/SEC)	2.55	VALVE VAULT ALUMINUM HATCH SIZE	36" X 36"
C' VALUE	140	BACKWASH TANK & VALVE VAULT MATERIAL	CONCRETE
4" CLASS 350 D.I. PIPE HI/100FT	0.66	TANK CAPACITY USEABLE	92,700 GAL.
FORCE MAIN HEAD LOSS IN FT.	1.06	INSIDE TANK DEPTH	11'-10"
FORCE MAIN LIFT	6.0	BACKWASH PUMP ACCESS HATCH SIZE	48" X 48"
PUMP WEAR ALLOWANCE (FT.)	1.94	VISUAL LIGHT & AUDIBLE ALARM AT MCC	YES
TOTAL DYNAMIC HEAD (FT.)	8.0	TOP OF BACKWASH TANK ELEVATION	457.00
MANUFACTURER & MODEL NUMBER	YEMANS #4092.5	HIGH LEVEL ALARM ELEVATION	454.20
PUMP HORSEPOWER	15 HP (MOTOR STD.: YCC)	LAG PUMP ON ELEVATION	449.70
PUMP SPEED (RPM)	1,600	LEAD PUMP ON ELEVATION	447.70
IMPELLER DIAMETER	9.0 (#Y-4921-C)	BOTH PUMPS OFF ELEVATION	445.70
TYPE LIFT STATION	DUPLEX NON-CLOG 480V, 3 PHASE	INSIDE BOTTOM OF TANK ELEVATION	442.00
POWER SUPPLY		VOL. BETWEEN OFF & LEAD PUMP ON (GALLONS)	18,553
NEMA STARTER SIZE	2		

NOTES:
1. MOTOR STARTERS FOR BACKWASH PUMPS SHALL BE IN MCC PANEL. PROVIDE START/STOP OPERATION FOR PUMPS BASED OFF OF FLOATS. ALTERNATE PUMP LEAD/LAG. RUN CONDUIT & CONDUCTORS TO CONTROLS AT MCC PANEL.
2. LOCK OUT PUMPS AFTER FILTER BACKWASH FOR AN ADJUSTABLE TIME PERIOD VIA SCADA. ALLOW OVERRIDE. ONLY ALLOW PUMPS TO OPERATE IF ANY WELL IS OPERATING (INCLUDES HAND OPERATION)



4 LINK SEAL DETAIL
NO SCALE

5 CONCRETE REINFORCING AT FLOOR ACCESS HATCH - PLAN
SCALE: 1/2" = 1'-0"

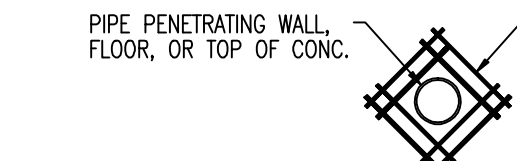


7 BACKWASH TANK TOP CORNER DETAIL
SCALE: 1/2" = 1'-0"

8 BACKWASH BOTTOM CORNER DETAIL
SCALE: 1/2" = 1'-0"

WALL/ FLOOR SLEEVE SCHEDULE						
NO.	PIPE DIA.	FUNCTION	LOCATION	THICKNESS		CENTERLINE ELEVATION
				WALLS	SLAB	
1	12"	BACKWASH FROM FILTERS	WALL	12"	M.J. x P.E.	12" 452.00
2	12"	FUTURE BACKWASH FROM FILTERS	WALL	12"	M.J. x P.E.	12" 452.00
3	4"	RETURN BACKWASH	WALL	12"	P.E. x P.E.	448.00
4	4"	RETURN BACKWASH	WALL	12"	P.E. x P.E.	448.00
5	6"	TANK VENT	TOP	14"		N/A
6	6"	TANK VENT	TOP	14"		N/A

VERIFY ALL PIPE CENTERLINE LOCATIONS

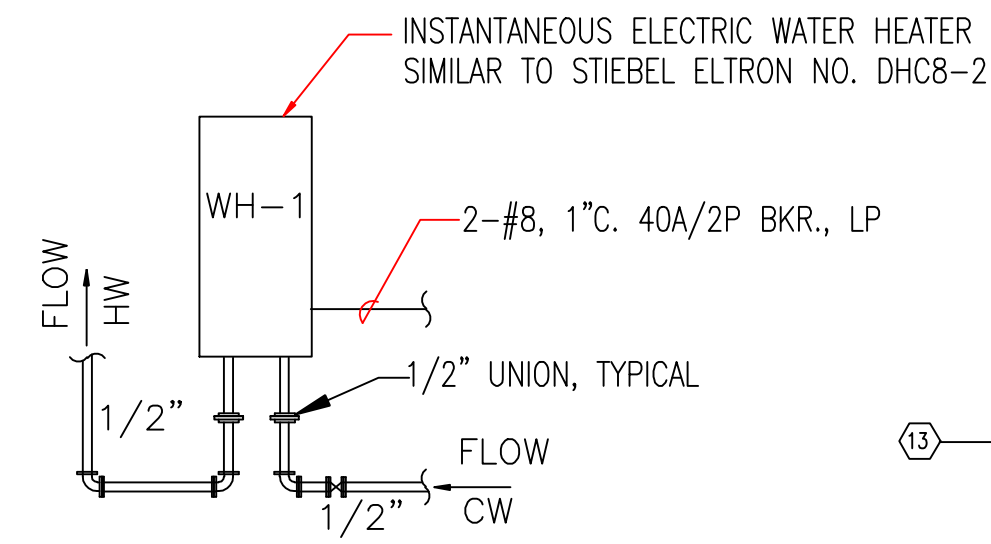


6 CONCRETE REINFORCING AT PIPE PENETRATIONS
NO SCALE

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INDIANA DEPARTMENT OF NATURAL RESOURCES
D.A.P.W. PROJECT NO. E030094
CHARLESTOWN STATE PARK
WATER SUPPLY IMPROVEMENTS
DIVISION II--WELLS, WTP & BOOSTER STATION
BACKWASH HOLDING TANK PLAN & SECTIONS
DATE: _____ APPROVED BY: _____ DRAWING NUMBER: _____



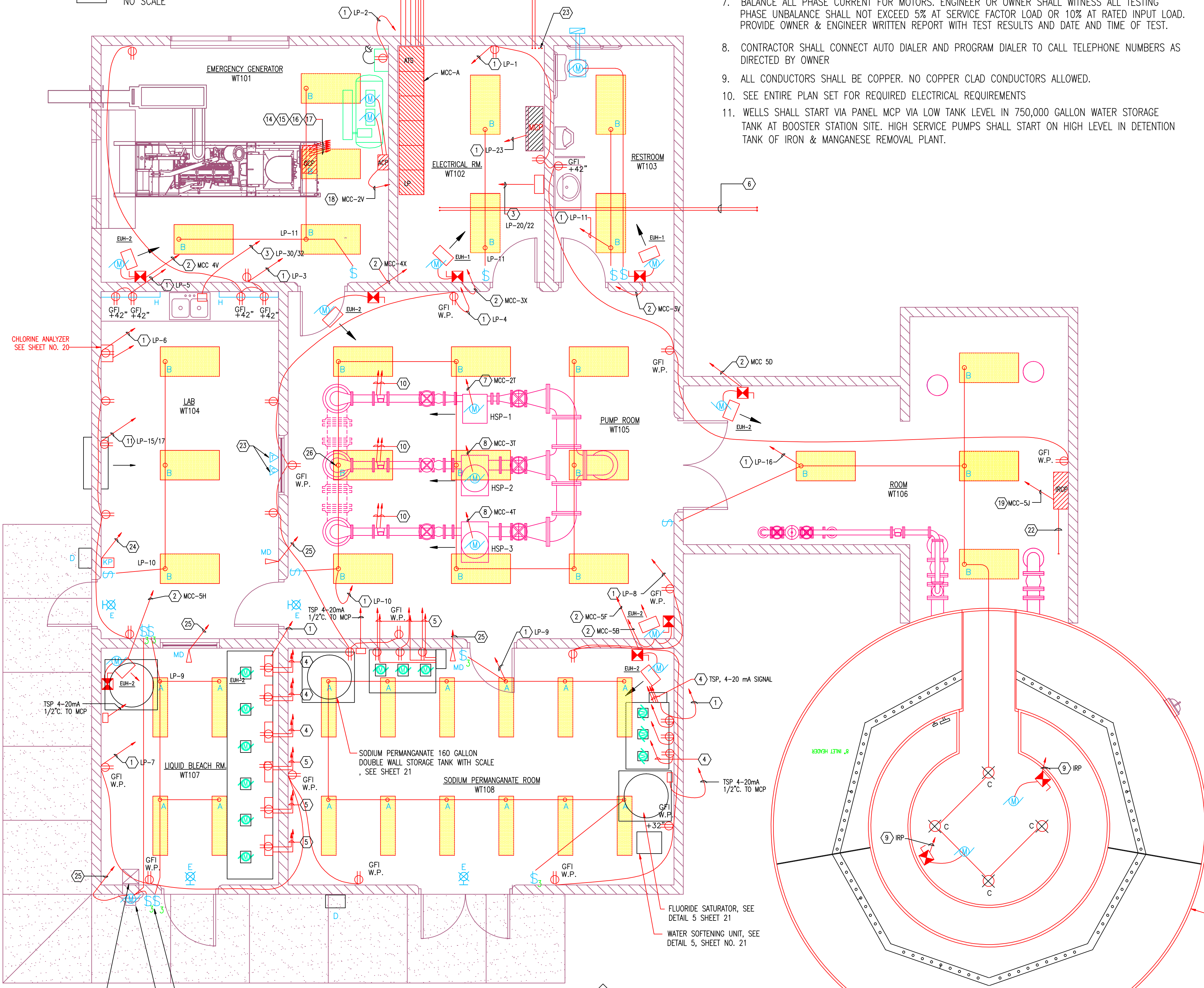


2 INSTANTANEOUS WATER HEATER DETAIL
24 NO SCALE

GENERAL ELECTRIC NOTES:

1. ALL WORK SHALL BE DONE IN ACCORDANCE WITH ALL LOCAL CODES & ORDINANCES, & IN NO INSTANCES SHALL THE ELECTRICAL WORK BE LESS THAN THE REQUIREMENTS OF THE LATEST PRINTED EDITION OF THE NATIONAL ELECTRIC CODE.
2. MINIMUM WIRE SIZE SHALL BE #12 COPPER UNLESS SHOWN OTHERWISE
3. ALL CONDUCTORS SHALL BE IN CONDUIT & BELOW FLOOR, IN BLOCK, OR ABOVE CEILING, EXCEPT WHEN APPROVED BY ENGINEER IN WRITING
4. GROUND ALL EQUIPMENT, FIXTURE & SYSTEMS AS PER THE REQUIREMENTS OF THE NEC & NFPA.
5. CONTRACTOR SHALL PROVIDE CIRCUITS, CONDUIT, BREAKERS, AND SIGNAL CIRCUITS FOR ALL EQUIPMENT FURNISHED BY CONTRACTOR AS PART OF CONTRACT
6. TEST ALL CONDUCTORS. CONDUCTORS SHALL BE MEGGED. ENGINEER SHALL WITNESS ALL TESTING. MEGOHMS READINGS SHALL FALL WITHIN CONDUCTOR SUPPLIER'S RECOMMENDATION CONDUCTORS NOT PASSING SHALL BE REPLACED BY CONTRACTOR AT HIS EXPENSE. PROVIDE OWNER & ENGINEER WRITTEN REPORT WITH TEST RESULTS AND DATE AND TIME OF TEST.
7. BALANCE ALL PHASE CURRENT FOR MOTORS. ENGINEER OR OWNER SHALL WITNESS ALL TESTING PHASE UNBALANCE SHALL NOT EXCEED 5% AT SERVICE FACTOR LOAD OR 10% AT RATED INPUT LOAD. PROVIDE OWNER & ENGINEER WRITTEN REPORT WITH TEST RESULTS AND DATE AND TIME OF TEST.
8. CONTRACTOR SHALL CONNECT AUTO DIALER AND PROGRAM DIALER TO CALL TELEPHONE NUMBERS AS DIRECTED BY OWNER
9. ALL CONDUCTORS SHALL BE COPPER. NO COPPER CLAD CONDUCTORS ALLOWED.
10. SEE ENTIRE PLAN SET FOR REQUIRED ELECTRICAL REQUIREMENTS
11. WELLS SHALL START VIA PANEL MCP VIA LOW TANK LEVEL IN 750,000 GALLON WATER STORAGE TANK AT BOOSTER STATION SITE. HIGH SERVICE PUMPS SHALL START ON HIGH LEVEL IN DETENTION TANK OF IRON & MANGANESE REMOVAL PLANT.

- 1 2-#12, 1/2" C., 20A/SP BKR. PANEL LP
- 2 2-#12, 1/2" C., 20A/3P BKR. PANEL MCC. MOUNT UNIT HEATER DISCONNECT 5'-0" ABOVE FLOOR & UNIT HEATER AT 7'-6" ABOVE FLOOR
- 3 2-#8, 1" C., 40A/2P BKR. PANEL LP. SEE ELECTRIC WATER HEATER DETAIL AT LEFT
- 4 2-#16, 1/2" C., PANEL MCP. ENERGIZE PUMP OUTLETS WITH START OF MATCHED HSP PUMP & DEENERGIZE WITH STOP MATCHED HSP. PROVIDE TSP, 1/2°C. 4-20mA FLOW RATE SIGNAL FROM MCP
- 4A 2-#16, 1/2" C., PANEL MCP. ENERGIZE PUMP OUTLETS WITH START OF MATCHED WELL PUMP & DEENERGIZE WITH STOP OF MATCHED WELL PROVIDE TSP, 1/2°C. 4-20mA FLOW RATE SIGNAL FROM MCP
- 5 2-#12, 1/2" C., PANEL MCP. ENERGIZE SODIUM PERMANGANATE PUMP OUTLETS WITH START OF MATCHED WELL & DEENERGIZE WITH THE STOP OF MATCHED WELL. PROVIDE 1/2°C. FOR FUTURE 4-20 mA RATE SIGNAL FROM MCP
- 6 STUB 2-1" CONDUITS OUT 10' FROM BUILDING FOR FUTURE IRON REMOVAL PLANT #2 & CAP CONDUITS 6" ABOVE FLOOR
- 7 3-#4, 2°C., TO MOTOR STARTER IN MCC. PROVIDE 2' OF FLEX CONDUIT AT PUMP 50 HP, 480V., 3 PHASE MOTOR PROVIDE 8-#16, 1" CONDUIT FROM STARTER TO PANEL SP FOR START/STOP, RUN & FAIL SIGNALS
- 8 3-#2/0, 2°C., TO MOTOR STARTER IN MCC. PROVIDE 2' OF FLEX CONDUIT AT PUMP 100 HP, 480V., 3 PHASE MOTOR PROVIDE 8-#16, 1" CONDUIT FROM STARTER TO PANEL SP FOR START/STOP, RUN & FAIL SIGNALS
- 9 3-#12, 3/4°C., 15A/3P BKR. IRCP PROVIDE NEMA 4X STAINLESS STEEL DISCONNECT FOR 3/4 HP, 480V., 3 PHASE BLOWER. MOUNT DISCONNECT FROM HANDRAIL AND RUN CONDUIT DOWN OUTSIDE FACE OF IRON REMOVAL PLANT.
- 10 STP, 3/4°C. FROM WATER METER TO SCADA PANEL MCP PROVIDE 2#12, 1/2°C. POWER SUPPLY TO METER
- 11 3-#10, 3/4°C., 30A/2P BKR. PANEL LP PACKAGED TERMINAL AIR CONDITIONING UNIT (HEAT PUMP) EQUAL TO FRIEDRICH MODEL PDH15KSS, 15,050 BTU COOLING, WITH LEXAN GRILLE & WALL CASE. 240 V., 1 PHASE. GRANGER MODEL 10FA5
- 12 DIRECT BURY CONDUCTORS 4' BELOW GRADE & PROVIDE 2" CONDUIT STUBBED 10' FROM BUILDING & EACH WELL. 3-#6 TO WELL NO. 1 3-#4 TO WELL NO. 2, & 3-#3 TO WELL NO. 3. PROVIDE STAINLESS FUSED DISCONNECT AT EACH WELL. SEE WELL DETAILS.
- 13 DIRECT BURY CONDUCTORS 4' BELOW GRADE & PROVIDE 1 1/2" CONDUIT STUBBED 10' FROM BUILDING & EACH WELL. 2-#6 TO WELL NO. 1 2-#2 TO WELL NO. 2, & 2-#1 TO WELL NO. 3 LIGHT FIXTURES "J"
- 14 3 PARALLEL SETS OF 3-400 MCM COPPER W/GROUND, 4" CONDUITS UNDERGROUND SERVICE ENTRANCE CONDUCTORS
- 15 2 PARALLEL SETS OF 3-600 MCM W/GROUND, 4" CONDUITS FROM GENERATOR CONTROL PANEL TO AUTOMATIC TRANSFER SWITCH
- 16 2-#12, 1/2°C., 20A/2P BKR. LP 26/28, GENERATOR 240V., SINGLE PHASE HEATER
- 17 2-#12, 1/2°C., 20A/SP BKR., LP-25 GENERATOR BATTERY CHARGER
- 18 6-#16, 3/4°C. GENERATOR COMMON ALARM & 2#16, 1/2°C. FUEL RUPTURE ALARM EACH TO SCADA PANEL SP
- 19 3-#12, 1/2°C. 20A/2P BKR. MCC-2V TO AIR COMPRESSOR PANEL ACP
- 20 3-#12, 1/2°C. 20A/3P BKR. MCC-SJ, TO IRON REMOVAL PLANT CONTROL PANEL IRCP. PROVIDE 4-#12, 3/4°C. FROM PANEL IRCP TO SCADA PANEL MCP FOR START STOP OF BLOWERS
- 21 STUB 3-2" CONDUITS OUT 10' FROM BUILDING FOR FUTURE WELLS & CAP CONDUITS 6" ABOVE FLOOR
- 22 STUB 3-1" CONDUITS OUT 10' FROM BUILDING FOR FUTURE & CAP CONDUITS 6" ABOVE FLOOR
- 23 PROVIDE CONDUIT & CONDUCTORS TO ALL VALVES, WATER METER AND VACUUM SWITCH. VERIFY REQUIREMENTS WITH IRON REMOVAL PLANT MANUFACTURER PRIOR TO BIDDING.
- 24 PROVIDE TELEPHONE AND COMPUTER OUTLETS. RUN 1" EMPTY CONDUITS TO WEST WALL OF ELECTRICAL WALL & TURN UP AND CAP 6" ABOVE FLOOR.
- 25 SECURITY KEYPAD. CONNECT 6-#16, 1/2°C. TO MCP
- 26 MOTION DETECTOR, 2-#16, 1/2°C. TO MCP
- 27 PROVIDE PRESSURE TRANSDUCER IN PIPE WITH 2-#16, 1/2°C. TO MCP. PROVIDE POWER SUPPLY TO PRESSURE TRANSDUCER



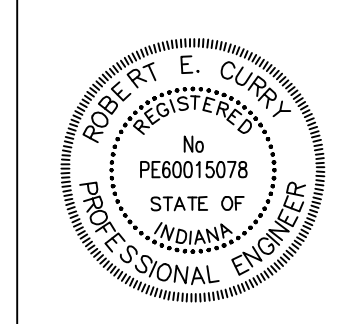
LIGHT FIXTURE SCHEDULE				
FIXTURE NO.	DESCRIPTION	NO. OF LAMPS	MANUFACTURER	MODEL NO.
A	DAMP LOCATION 4' FLUORESCENT	2-40 W	HUBBELL	EDL042R-SP DR-E1
B	2 x 4' SURFACE FLUORESCENT	4-40 W	HUBBELL	SSD4CA05-E1
C	NON-METALLIC VAPOR TIGHT	100 W	HUBBELL	NVA 15GG
D	WALL PACK W/PHOTOCELL	175W	HUBBELL	PERIMAMITE PRM-175H-118
E	EXIT LIGHT	2-15W	HUBBELL	EX20EI-UR1
F	EXHAUST FAN		JENNFAN	100J, 100 CFM W/10" x 3 1/2" DUCT
H	4' SURFACE FLUORESCENT	1-40 W	HUBBELL	UL140SO UNDERCABINET FIXTURE W/SWITCH
J	DUCK TO DAWN MERCURY VAPOR	1-175	HUBBELL	NPU-175 (AT EACH WELL)

- NOTES:
1. PROVIDE CIRCUIT & BREAKER AS REQUIRED FOR ALL FIXTURES
 2. SEE HVAC PLAN FOR EXHAUST FAN DUCT AND EXHAUST GRILLE IN SOFFIT
 3. SWITCH FIXTURE "D" NEAR LAB DOOR (CLARIFIER & OXIDATION DITCH FIXTURE, SEE FIXTURE "D" DETAIL NO. 2 ON CLARIFIER DRAWING)
 4. MOUNT FIXTURE "C" 12" ABOVE FINISHED FLOOR ELEVATION

ELECTRIC UNIT HEATER AND BASEBOARD HEATER SCHEDULE					
NO.	DESCRIPTION	KW	VOLT	PHASE	MODEL NO.
EUH-1	ELECTRIC UNIT HEATER	10	480	3	EMERSON MUH-10-04
EUH-2	ELECTRIC UNIT HEATER	15	480	3	EMERSON MUH-15-04

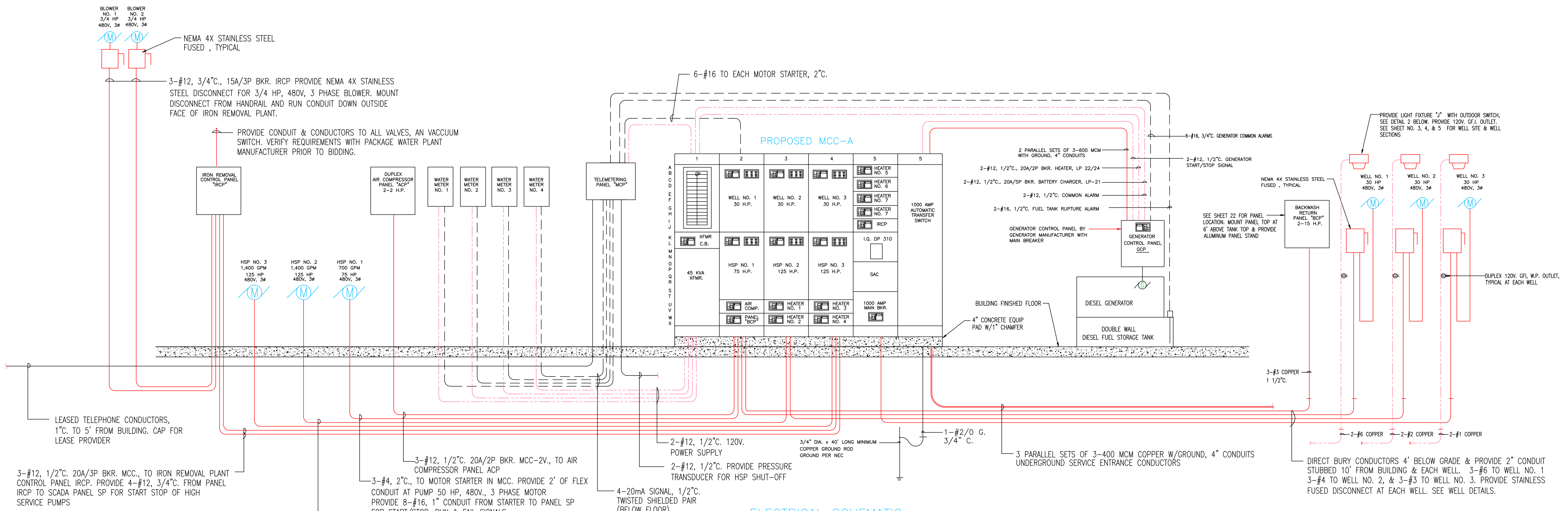
- NOTES:
1. ALL UNIT HEATERS SHALL BE SUPPLIED WITH SELF CONTAINED THERMOSTAT
 2. PROVIDE WALL MOUNTING BRACKET FOR ALL UNIT HEATERS.
 3. SEE FLOOR PLAN FOR UNIT ELECTRIC UNIT HEATER DETAIL

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DEPARTMENT OF NATURAL RESOURCES CHARLESTON STATE PARK		DATE:	APPROVED BY:	DRAWING NUMBER:
D.A.P.W. PROJECT NO. E030094 WATERWORKS IMPROVEMENTS DIVISION II-WELLS, WTP, & BOOSTER STATION		NOVEMBER 5, 2009		24 OF 36
WTP ELECTRICAL PLAN				

1 WTP ELECTRICAL PLAN
24 SCALE: 1/4"=1'-0"



1 ELECTRICAL SCHEMATIC
25 NO SCALE

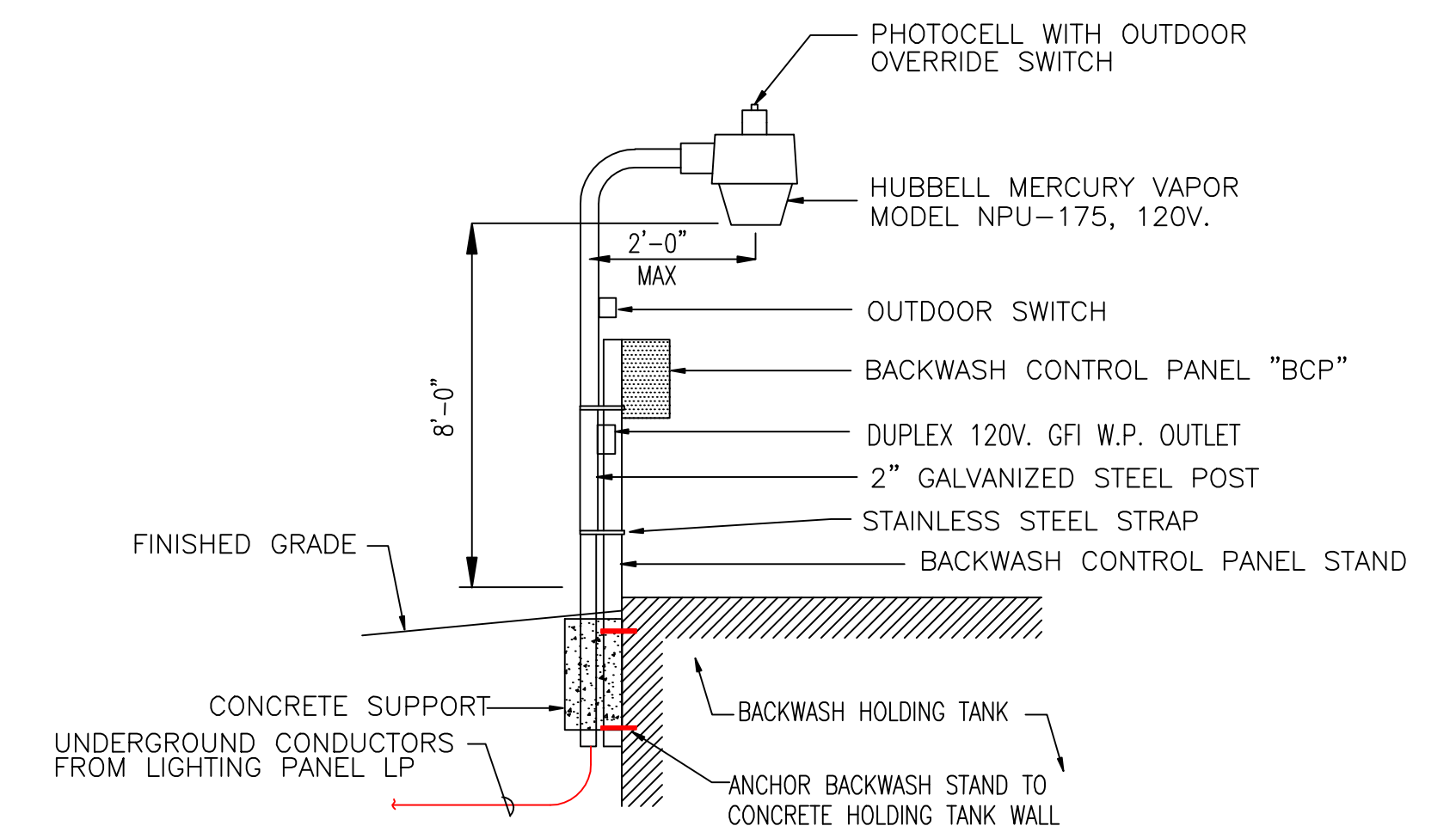
MOTOR CONTROL CENTER DATA													
UNIT NO.	CLASS OR DESCRIPTION	STARTER SIZE	H.P.	FLA	CONTROL DEVICE CODE	BREAKER FRAME	POLE	TRIP AMPS	SEE MCC NOTES	CONTACTS NO. NC	CPT VA	NAMEPLATE INFORMATION	GEN. STEP LOADING
1L	C.B.					HFD	2	200				LIGHTING PANEL 42 SPACES	1
1X	C.B.					HFD	3	100				45 KVA TRANSFORMER BREAKER	1
1X	XFMR											45 KVA 3 PHASE TP SINGLE PHASE 45 KVA TRANSFORMER	1
2J	IT SOFT STARTER	3	30	40	H-O-A/P/L	HMCP	3	80	2,3,4,5,6	2	2	WELL PUMP NO. 1	1
2T	IT SOFT STARTER	4	75	96	H-O-A/P/L	HMCP	3	150	2,3,4,5,6	2	2	HIGH SERVICE PUMP NO. 1	2
2V	C.B.					HFD	3	20				AIR COMPRESSOR CONTROL PANEL ACP	1
2X	C.B.					HFD	3	75				BACKWASH RETURN PUMPS PANEL BCP	1
3J	IT SOFT STARTER	3	30	40	H-O-A/P/L	HMCP	3	80	2,3,4,5,6	2	2	WELL PUMP NO. 2	2
3T	IT SOFT STARTER	3	125	156	H-O-A/P/L	HMCP	3	225	2,3,4,5,6	2	2	HIGH SERVICE PUMP NO. 2	2
3V	C.B.					HFD	3	15				5 KW ELECTRIC UNIT HEATER NO 1 RESTROOM	1
3X	C.B.					HFD	3	15				5 KW ELECTRIC UNIT HEATER NO 2 ELECTRICAL ROOM	1
4J	IT SOFT STARTER	3	30	40	H-O-A/P/L	HMCP	3	80	2,3,4,5,6	2	2	WELL PUMP NO. 3	3
4T	IT SOFT STARTER	3	125	156	H-O-A/P/L	HMCP	3	225	2,3,4,5,6	2	2	HIGH SERVICE PUMP NO. 3	3
4V	C.B.					HFD	3	20				15 KW ELECTRIC UNIT HEATER NO 3 GENERATOR ROOM	1
4X	C.B.					HFD	3	20				15 KW ELECTRIC UNIT HEATER NO 4 PUMP ROOM	1
5B	C.B.					HFD	3	20				15 KW ELECTRIC UNIT HEATER NO 5 PUMP ROOM	1
5D	C.B.					HFD	3	20				15 KW ELECTRIC UNIT HEATER NO 6 ROOM 106	1
5F	C.B.					HFD	3	20				15 KW ELECTRIC UNIT HEATER NO 7 SOD, PERMANGANATE RM	1
5H	C.B.					HFD	3	20				15 KW ELECTRIC UNIT HEATER NO. 8 CHLORINE ROOM	1
5J	C.B.					HFD	3	20				IRON REMOVAL PLANT CONTROL PANEL IRCP	1
5N	I.Q. METER LOG DP, 310							3				I.Q. DATA PLUS 310 METERING	
5T	SAC							3				SURGE ARRESTOR CAPACITOR	
5X	CKT BREAKER					HLD	3	1000				1000 AMP MAIN CIRCUIT BREAKER	
6	SERV. ENT. ATS					HLD	3	1000				SERVICE ENTRANCE RATE AUTOMATIC TRANSFER SWITCH	

MCC NOTES:

- PROVIDE CONTROLS FOR OPERATION OF 2 BACKWASH WASTE PUMPS. PUMPS SHALL ALTERNATE WITH LEAD/LAG & FLOAT CONTROL SEE SPECIFICATIONS
- PROVIDE O.L. RELAY ALARM CONTACT
- PROVIDE H-O-A COVER CONTROL / PILOT LIGHT (RUN) FOR ALL STARTERS
- PROVIDE AUX. CONTACTS: 1-N.O./1-N.C. ON OPERATOR OUTSIDE CONTROL SOURCE (PLC) FOR ALL STARTERS
- PROVIDE ELAPSED TIME METERS MOUNTED ON ALL STARTERS
- CONTRACTOR SHALL PROVIDE STEP RELAYS FOR GENERATOR STEP LOADING. STEP LOAD VIA SCADA. FIRST WELL STEP ONE, 2ND WELL STEP 2 (IN EXISTING MCC & NOT SHOWN ABOVE)
- PROVIDE CAPACITORS FOR 90% POWER FACTOR.
- VERIFY EQUIPMENT AND MINIMUM WIRE SIZED REQUIRED TO ALL SUPPLIED EQUIPMENT PRIOR TO BIDDING AND MAKE ADJUSTMENTS AS NEEDED

PANEL "LP" SCHEDULE									
Panelboard Designation: LP		Location: ELECTRICAL ROOM 102		Voltage: 120/240, 1-PH, 3W					
Ampere COPPER Bus: 200A		Mounting: SURFACE		Fed from: MCC					
LOAD DESIGNATION	CKT BKR	CKT NO.	PHASE A	PHASE B	NO.	CTK BKR	LOAD (kW)	LOAD DESIGNATION	
OUTLETS ROOMS 103, 105, 106	20	1	720	1920	2	20		AIR DRYER OUTLET ROOM 101	
OUTLETS ROOM 101 LAB	20	3		576	720	4	20	OUTLETS ROOMS 104, 107	
OUTLETS LAB	20	5	1920	1920	6	20		OUTLETS OFFICE 107	
OUTLETS ROOM CHLORINE ROOM	20	7		720	1920	8	20	OUTLETS ROOMS 104, 108	
LIGHTS ROOMS 109, CHLORINE ROOM	20	9	1120	1920		10	20	LIGHTS ROOMS 104, 107	
LIGHTS ROOMS 101, 102, 103	20	11			1280	1440	12	20	LIGHTS ROOM 106
SPARE	20	13				14	30	SPARE	
PTAC	30/2P	15			3336	1000	16	20	SPARE
SPARE		17	3336	1000		18	20	SPARE	
SPARE	20	19			3600	20	40/2P	WATER HEATER RESTROOM	
SPARE	20	21			3600	22		SPARE	
SCADA PANEL MCP	20	23			1920		24	20	SPARE
GENERATOR BATTERY CHARGER	20	25	1200	1500		26	20/2P	GENERATOR HEATER	
SPACE		27				1500	28		
SPACE		29			3600	30	40/2P	WATER HEATER LAB	
SPACE		31			750	3600	32		
SPACE		33					34	20	SPACE
SPACE		35					36	20	SPACE
SPACE		37					38	20	SPACE
SPACE		39					40	20	SPACE
SPACE		41					42	20	SPACE
TOTAL CONNECTED LOAD (Watts):			23,756	22,362					

NOTE: PROVIDE POWER, BREAKER, CONDUCTORS, AND CONDUIT TO ALL EQUIPMENT, OUTLETS & FIXTURES. SOME CIRCUITS MAY NOT BE SHOWN



1 LIGHT FIXTURE "J" DETAIL
25 NO SCALE

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INDIANA DEPARTMENT OF NATURAL RESOURCES
D.A.P.W. PROJECT NO. E030094

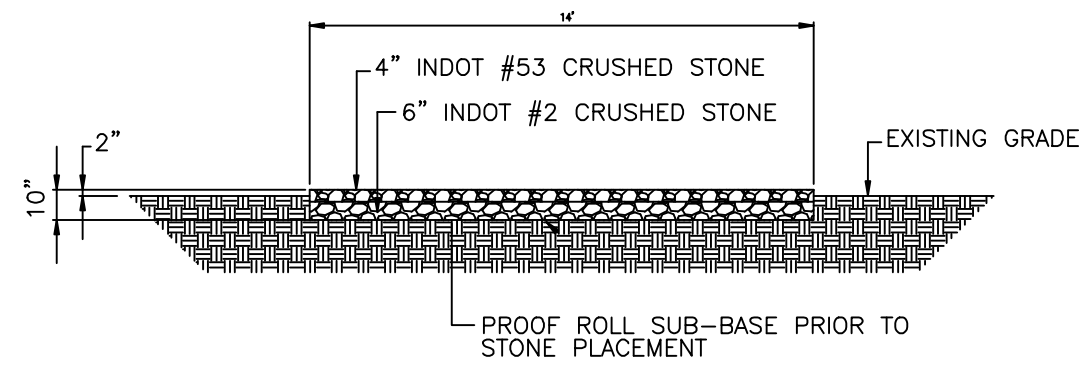
CHARLESTOWN STATE PARK
WATER SUPPLY IMPROVEMENTS
DIVISION II--WELLS, WTP & BOOSTER STATION

WTP ELECTRICAL SCHEMATIC

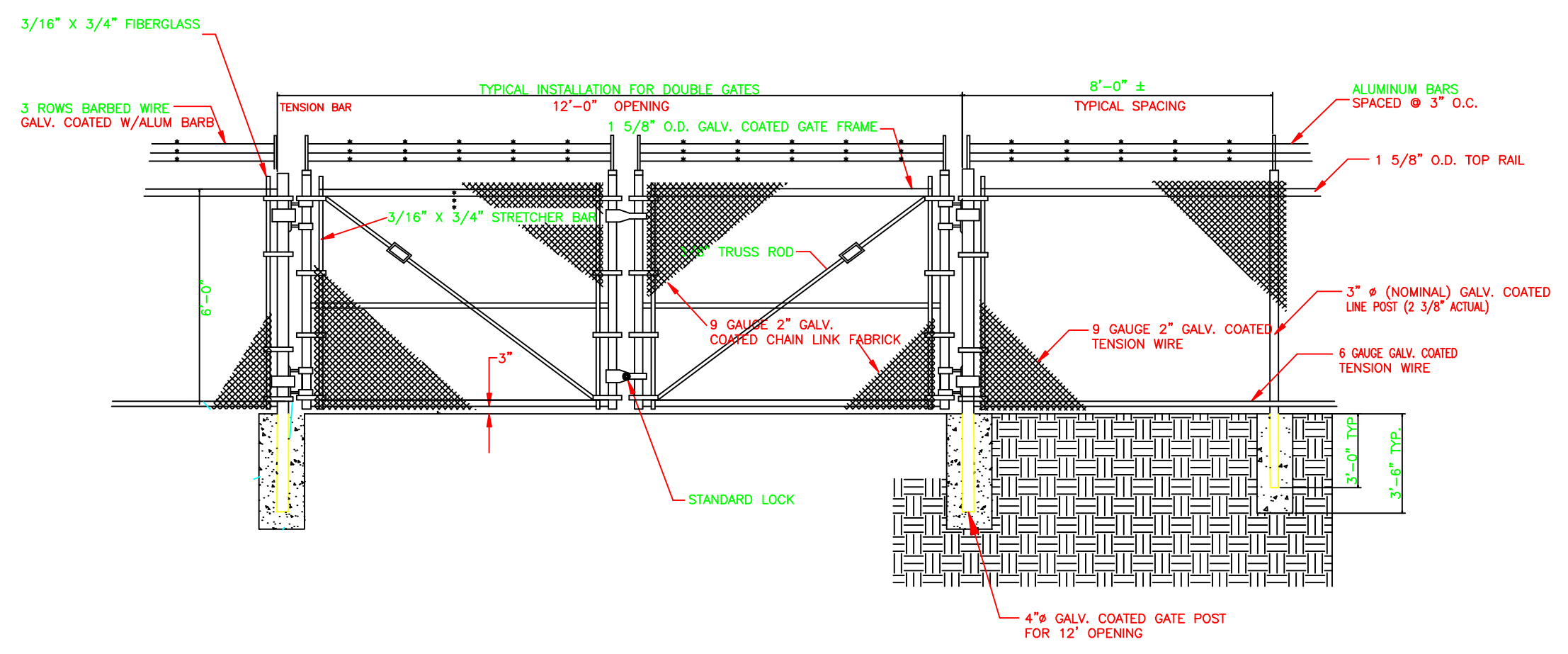
DATE: _____ APPROVED BY: _____ DRAWING NUMBER: 25 OF 36

LEGEND			
— 993 —	EXISTING GRADE	(SF)	SILT FENCE
— 993 —	PROPOSED GRADE	(TS)	TEMPORARY SEEDING
×	927.5 EXISTING SPOT GRADE	(PS)	PERMANENT SEEDING
×	927.5 PROPOSED SPOT GRADE	(M)	MULCH
● B1	EXISTING BORE HOLE	(RR)	RIP RAP
(WA)	CONCRETE WASHOUT	(EB)	EROSION CONTROL BLANKET
		(G)	GEOTEXTILE UNDERLAYMENT

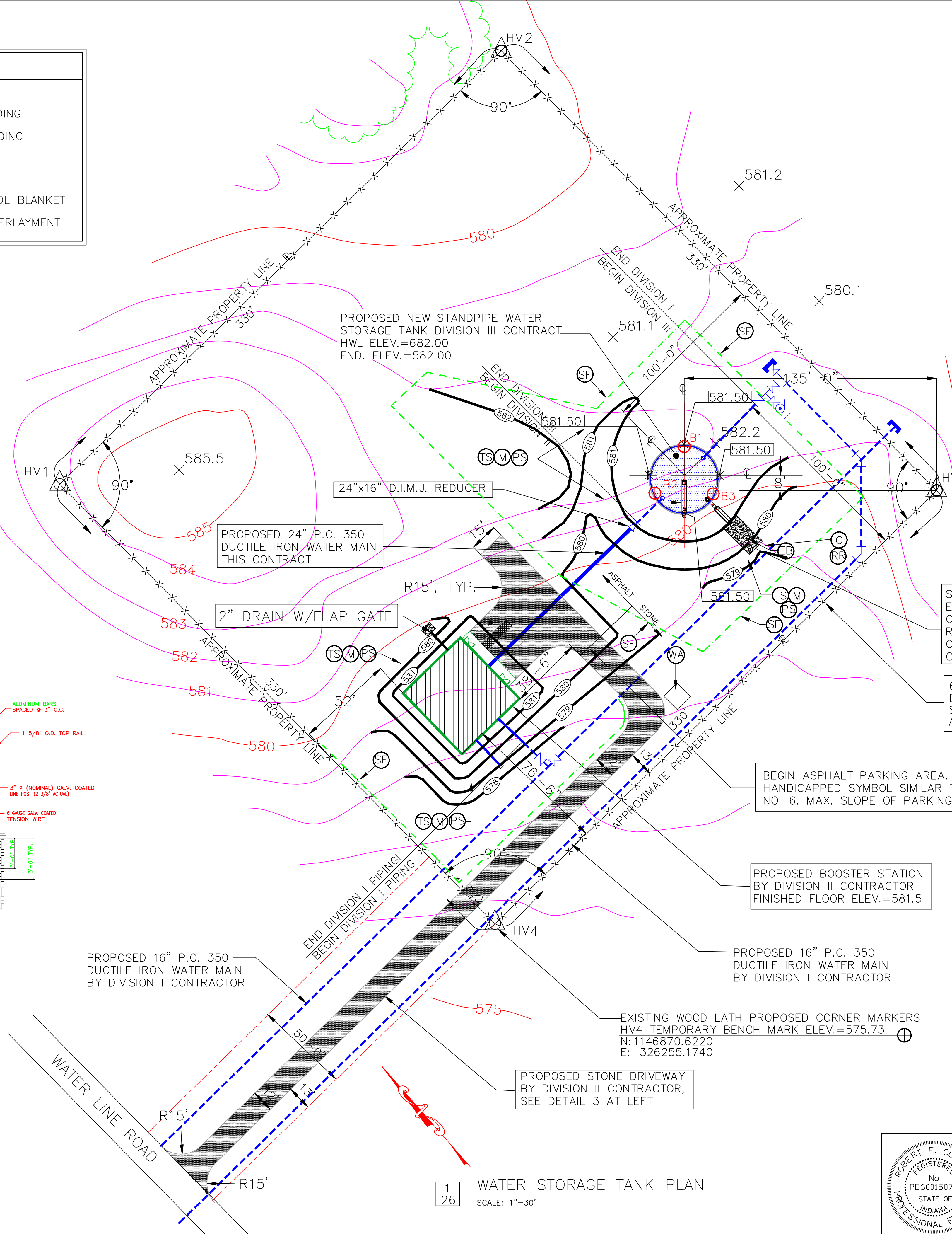
- NOTES:
- EACH STONE LAYER TO BE THOROUGHLY COMPACTED. DEPTHS OF STONE INDICATED ARE TO BE MINIMUM AFTER COMPACTION
 - ALL AGGREGATE SHALL BE WASHED PER INDOT REQUIREMENTS



3 TYPICAL DRIVE SECTION
26 NO SCALE



2 GATE DETAIL & FENCE SYSTEM
26 SCALE: 1"=30'



1 WATER STORAGE TANK PLAN
26 SCALE: 1"=30'

SPLASH BLOCK, BY DIVISION III CONTRACTOR. EROSION BLANKET & RIP RAP BY DIVISION II CONTRACTOR. DIVISION III CONTRACTOR SHALL ROUGH GRADE HIS DISTURBED AREAS ONLY. FINAL GRADING, MULCHING, & SEEDING BY DIVISION II CONTRACTOR

6'-0" HIGH CHAIN LINK FENCE BY DIVISION II CONTRACTOR SEE FENCE & GATE DETAIL 2 AT LEFT

BEGIN ASPHALT PARKING AREA. STRIPE & PROVIDE HANDICAPPED SYMBOL SIMILAR TO DETAIL 1 SHEET NO. 6. MAX. SLOPE OF PARKING AREA 1:12

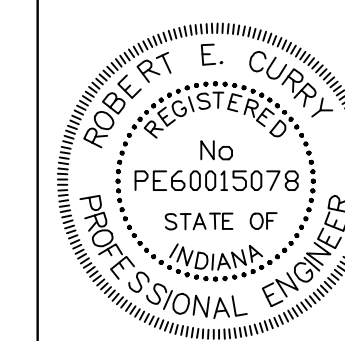
PROPOSED BOOSTER STATION BY DIVISION II CONTRACTOR FINISHED FLOOR ELEV.=581.5

PROPOSED 16" P.C. 350 DUCTILE IRON WATER MAIN BY DIVISION I CONTRACTOR

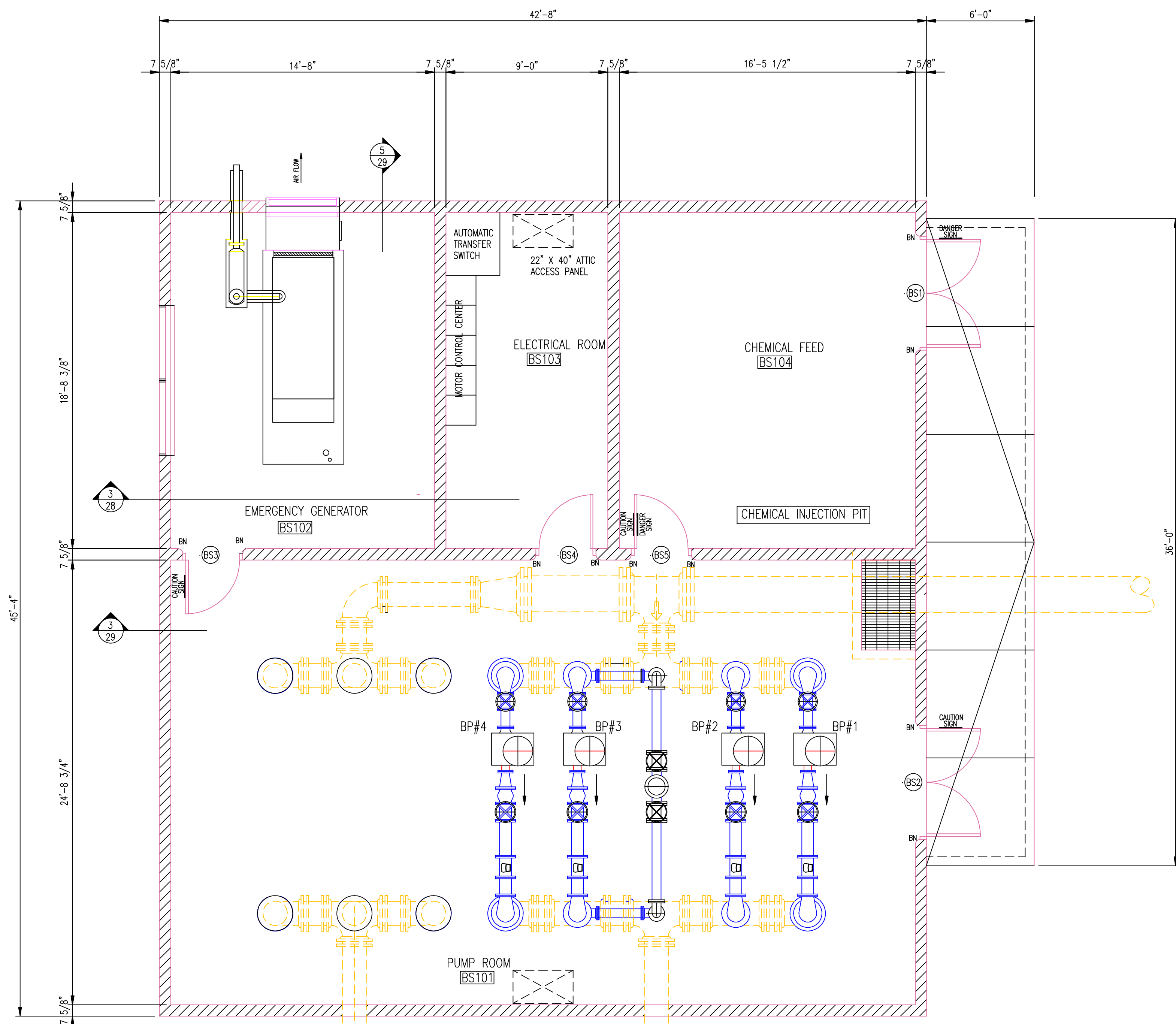
EXISTING WOOD LATH PROPOSED CORNER MARKERS HV4 TEMPORARY BENCH MARK ELEV.=575.73
N: 1146870.6220
E: 326255.1740

PROPOSED STONE DRIVEWAY BY DIVISION II CONTRACTOR, SEE DETAIL 3 AT LEFT

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INDIANA DEPARTMENT OF NATURAL RESOURCES D.A.P.W. PROJECT NO. E030094C		DRAWN BY:
CHARLESTOWN STATE PARK WATER SUPPLY IMPROVEMENTS DIV. II - WELLS, WTP & BOOSTER STATION		REVISION:
BOOSTER STATION SITE PLAN		
DATE: 11-5-09	APPROVED BY:	DRAWING NUMBER: 26 OF 36



ROOM FINISH SCHEDULE

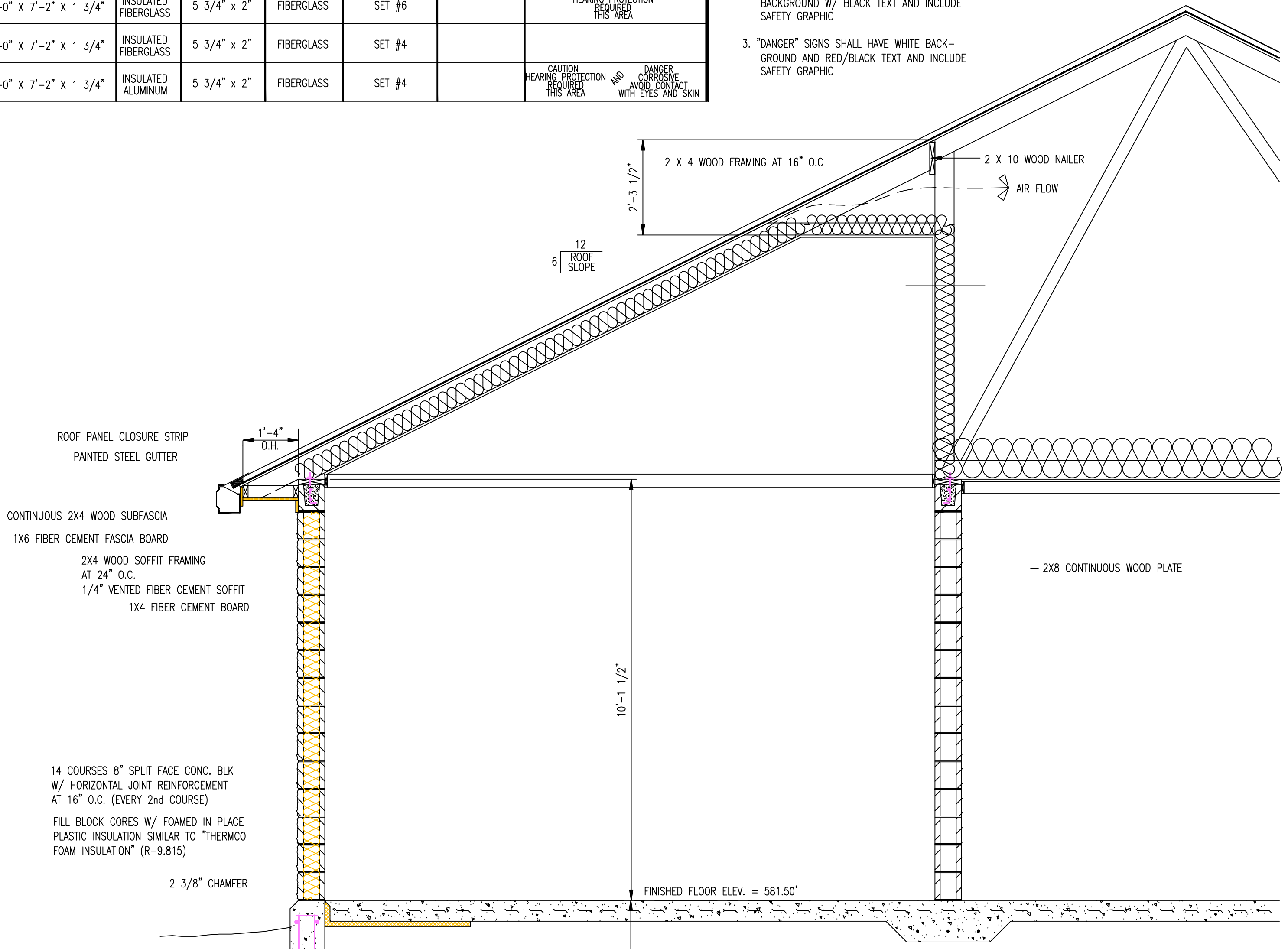
ROOM NUMBER	ROOM NAME	FLOOR	BASE	WALLS				CEILING	CEILING HEIGHT	REMARKS
				NORTH	SOUTH	EAST	WEST			
BS101	PUMP ROOM	SEALED CONCRETE	4" COVED VINYL BASE	PAINTED BLOCK/PLASTIC WALL PANELS	PAINTED CONCRETE BLOCK	PAINTED BLOCK/PLASTIC WALL PANELS	PAINTED CONCRETE BLOCK	PLASTIC CEILING PANELS	10'-1 1/2"	
BS102	EMERGENCY GENERATOR	SEALED CONCRETE	4" COVED VINYL BASE	PAINTED CONCRETE BLOCK	PAINTED CONCRETE BLOCK	PAINTED CONCRETE BLOCK	PAINTED CONCRETE BLOCK	PLASTIC CEILING PANELS	VARIES	
BS103	ELECTRICAL	SEALED CONCRETE	4" COVED VINYL BASE	PAINTED CONCRETE BLOCK	PAINTED CONCRETE BLOCK	PAINTED CONCRETE BLOCK	PAINTED CONCRETE BLOCK	PLASTIC CEILING PANELS	10'-1 1/2"	
BS104	CHEMICAL FEED	SEALED CONCRETE	4" COVED VINYL BASE	PAINTED CONCRETE BLOCK	PAINTED CONCRETE BLOCK	PAINTED CONCRETE BLOCK	PAINTED CONCRETE BLOCK	PLASTIC CEILING PANELS	10'-1 1/2"	

- #### GENERAL FLOOR PLAN NOTES
- ALL DIMENSIONS SHALL BE TO THE FACE OF CONC. BLOCK, UNLESS OTHERWISE NOTED.
 - ALL INTERIOR PARTITIONS SHALL BE 8" SMOOTH-FACE CONC. B UNLESS OTHERWISE NOTED.
 - UNLESS OTHERWISE NOTED, ALL INTERIOR PARTITION WALLS SHALL BE BUILT TO THE BOTTOM OF THE WOOD TRUSSES ABOVE.
 - PIPING & EQUIPMENT SHOWN FOR REFERENCE ONLY. SEE PIPING & EQUIPMENT PLANS FOR DIMENSIONS, LOCATIONS, E
 - DO NOT SCALE DRAWINGS!
 - BN = BULL NOSED CONCRETE BLOCK AT DOOR JAMBS

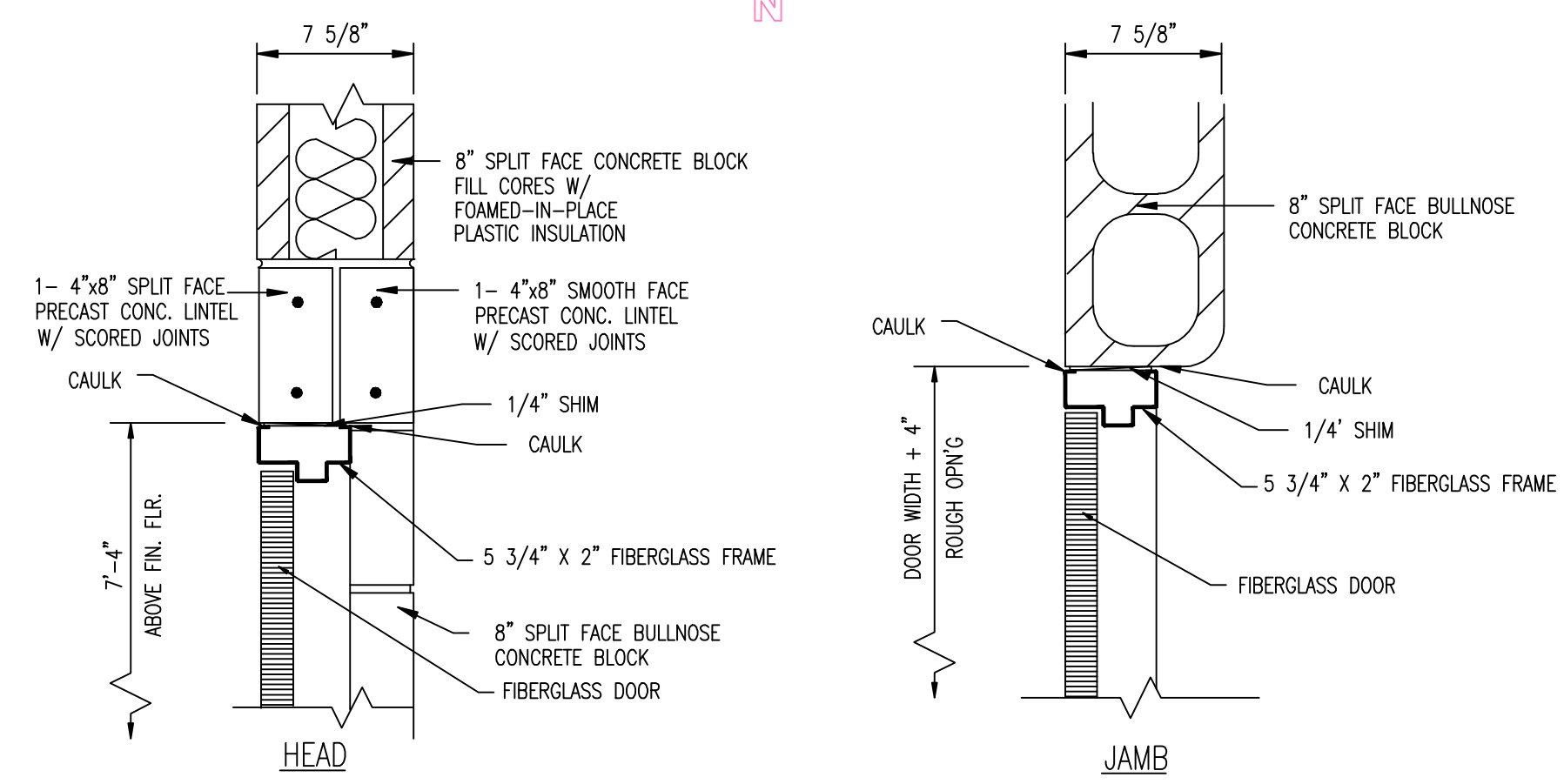
DOOR SCHEDULE

MARK	DOOR SIZE	DOOR TYPE	FRAME SIZE	FRAME TYPE	HARDWARE SET	REMARKS	SIGNAGE TEXT
BS1	PAIR - 3'-0" X 7'-2" X 1 3/4"	INSULATED FIBERGLASS	5 3/4" x 2"	FIBERGLASS	SET #1		CAUTION CORROSIVE AVOID CONTACT WITH EYES AND SKIN
BS2	PAIR - 3'-0" X 7'-2" X 1 3/4"	INSULATED FIBERGLASS	5 3/4" x 2"	FIBERGLASS	SET #1		CAUTION HEARING PROTECTION REQUIRED IN THIS AREA
BS3	1 - 3'-0" X 7'-2" X 1 3/4"	INSULATED FIBERGLASS	5 3/4" x 2"	FIBERGLASS	SET #6		CAUTION HEARING PROTECTION REQUIRED IN THIS AREA
BS4	1 - 3'-0" X 7'-2" X 1 3/4"	INSULATED FIBERGLASS	5 3/4" x 2"	FIBERGLASS	SET #4		
BS5	1 - 3'-0" X 7'-2" X 1 3/4"	INSULATED ALUMINUM	5 3/4" x 2"	FIBERGLASS	SET #4		CAUTION HEARING PROTECTION REQUIRED IN THIS AREA

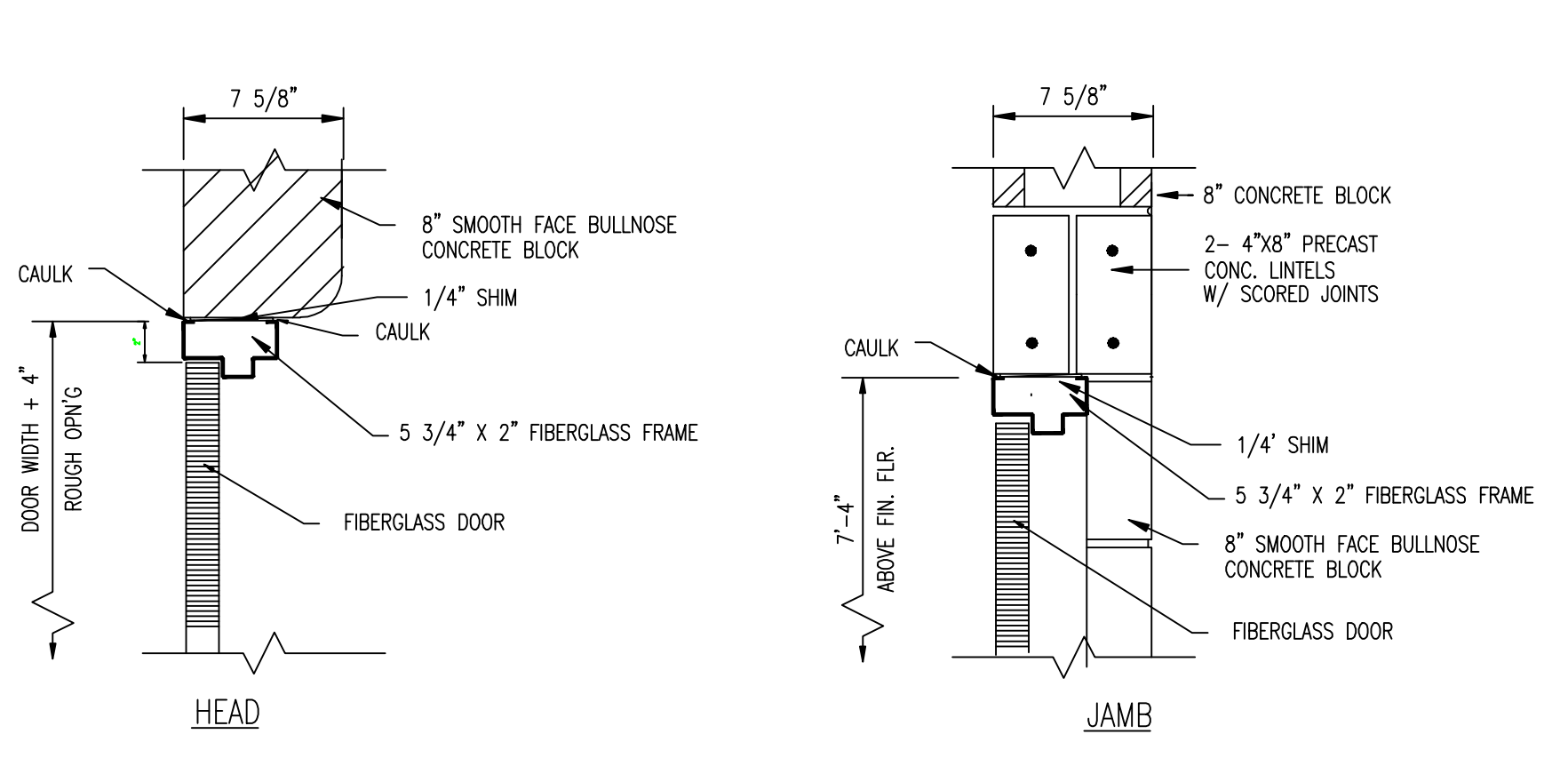
- #### SIGNAGE NOTES
- ALL SIGNS SHALL BE 10" X 14" X 0.1" THICK FIBERGLASS. UV RESISTANT. FACTORY EMBEDDED TEXT SIGNS SHALL CONFORM TO ANSI Z-535.2 1998 AND 29-CFR 1910.145
 - "CAUTION" SIGNS SHALL HAVE SAFETY YELLOW BACKGROUND W/ BLACK TEXT AND INCLUDE SAFETY GRAPHIC
 - "DANGER" SIGNS SHALL HAVE WHITE BACKGROUND AND RED/BLACK TEXT AND INCLUDE SAFETY GRAPHIC



1 FLOOR PLAN
SCALE 1/4" = 1'-0"



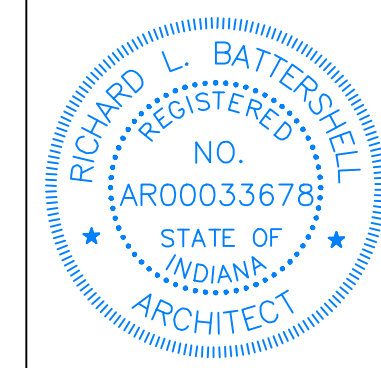
4 EXTERIOR FIBERGLASS DOOR DETAILS
SCALE 1 1/2" = 1'-0"



5 INTERIOR FIBERGLASS DOOR DETAILS
SCALE 1 1/2" = 1'-0"

14 COURSES 8" SPLIT FACE CONC. BLK W/ HORIZONTAL JOINT REINFORCEMENT AT 16" O.C. (EVERY 2nd COURSE)
FILL BLOCK CORES W/ FOAMED IN PLACE PLASTIC INSULATION SIMILAR TO "THERMOCO FOAM INSULATION" (R-9.815)

3 WALL SECTION AT BOOSTER STATION
GENERATOR ROOM
SCALE 1/2" = 1'-0"



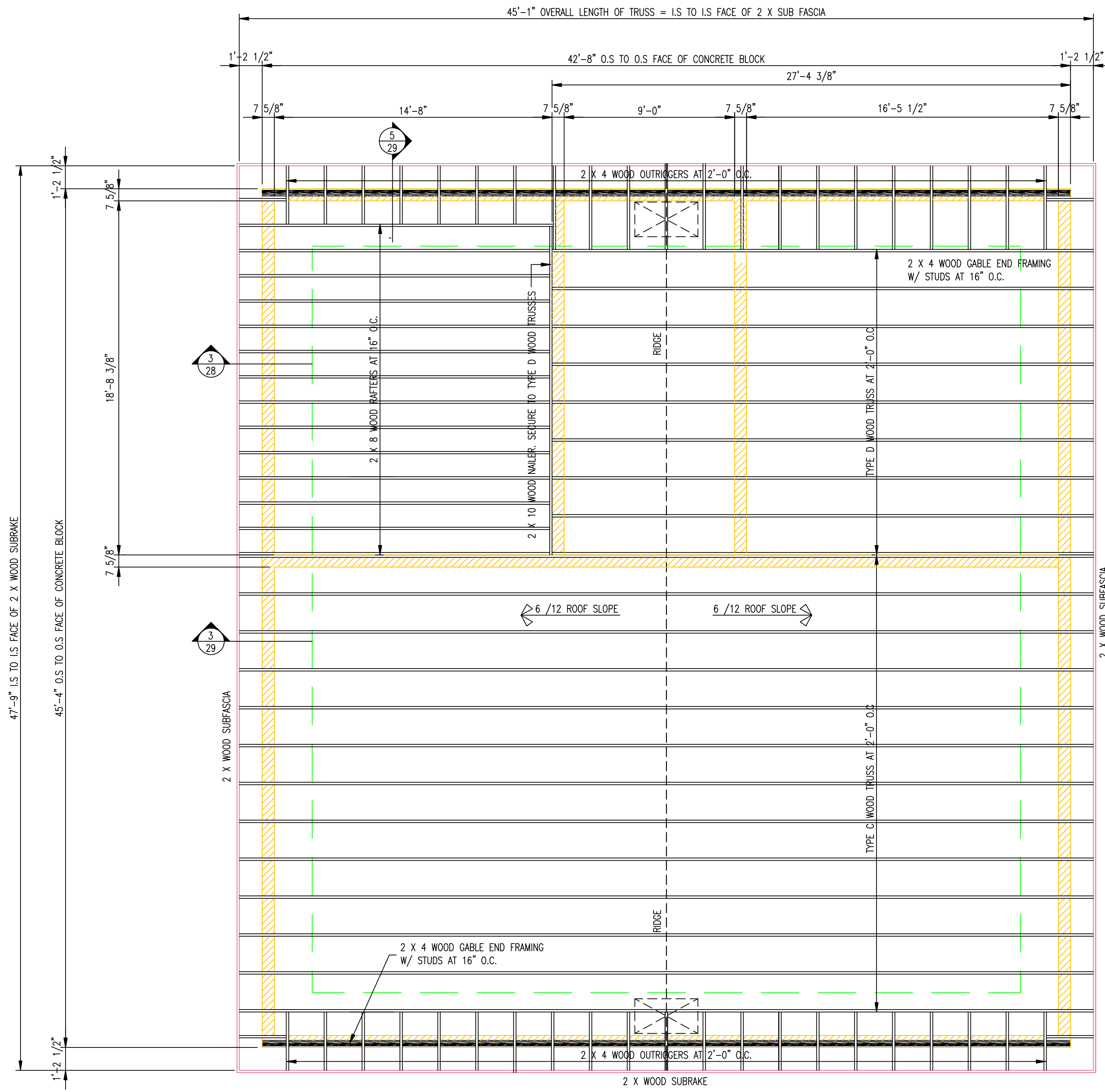
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INDIANA DEPARTMENT OF NATURAL RESOURCES
D.A.P.W. PROJECT NO. E030094

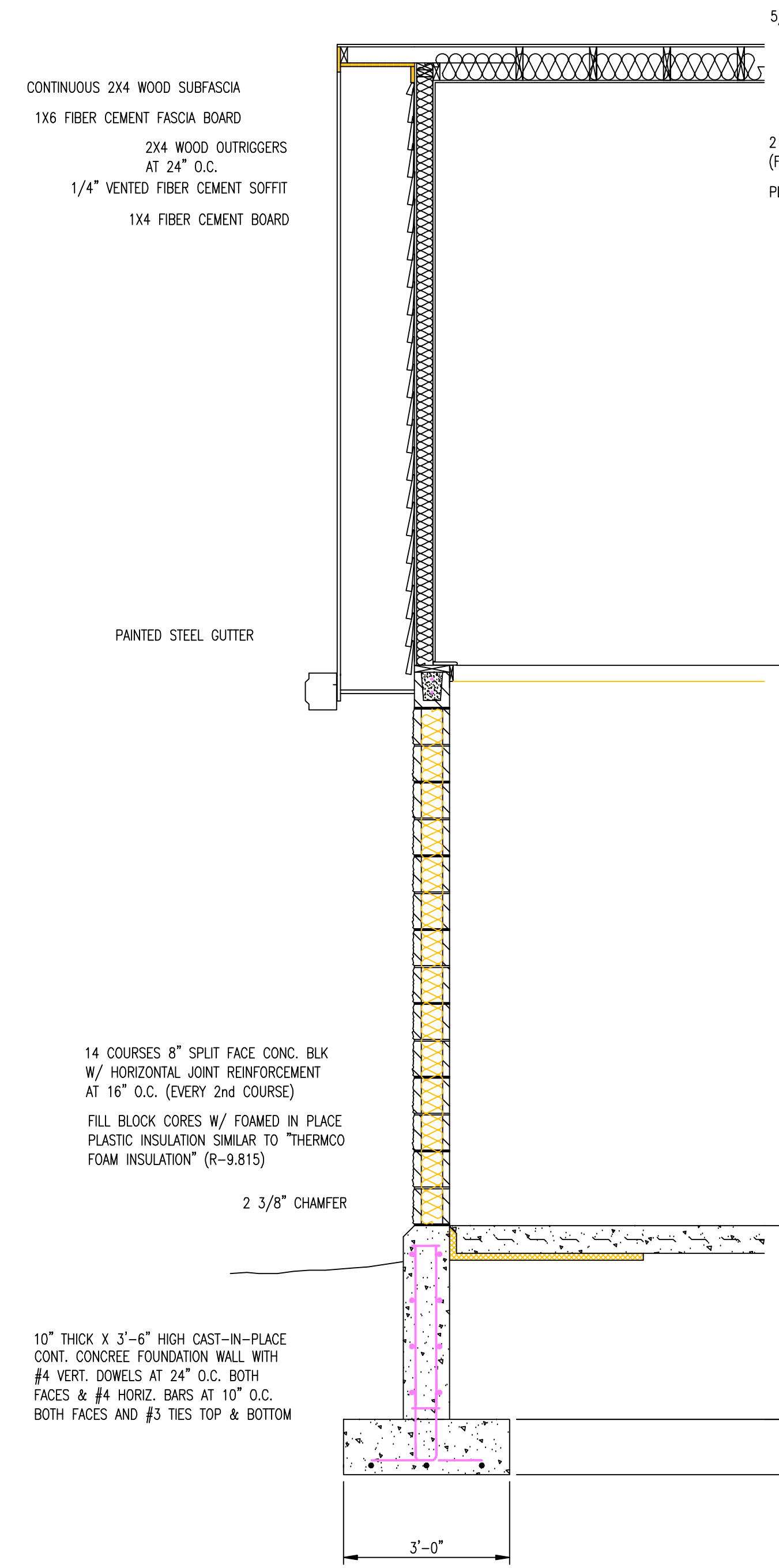
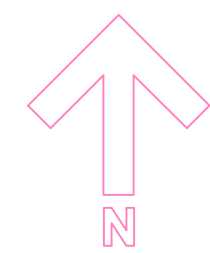
CHARLESTOWN STATE PARK
WATER SUPPLY IMPROVEMENTS
DIVISION II - WELLS, WTP & BOOSTER STATION

BOOSTER STATION FLOOR PLAN

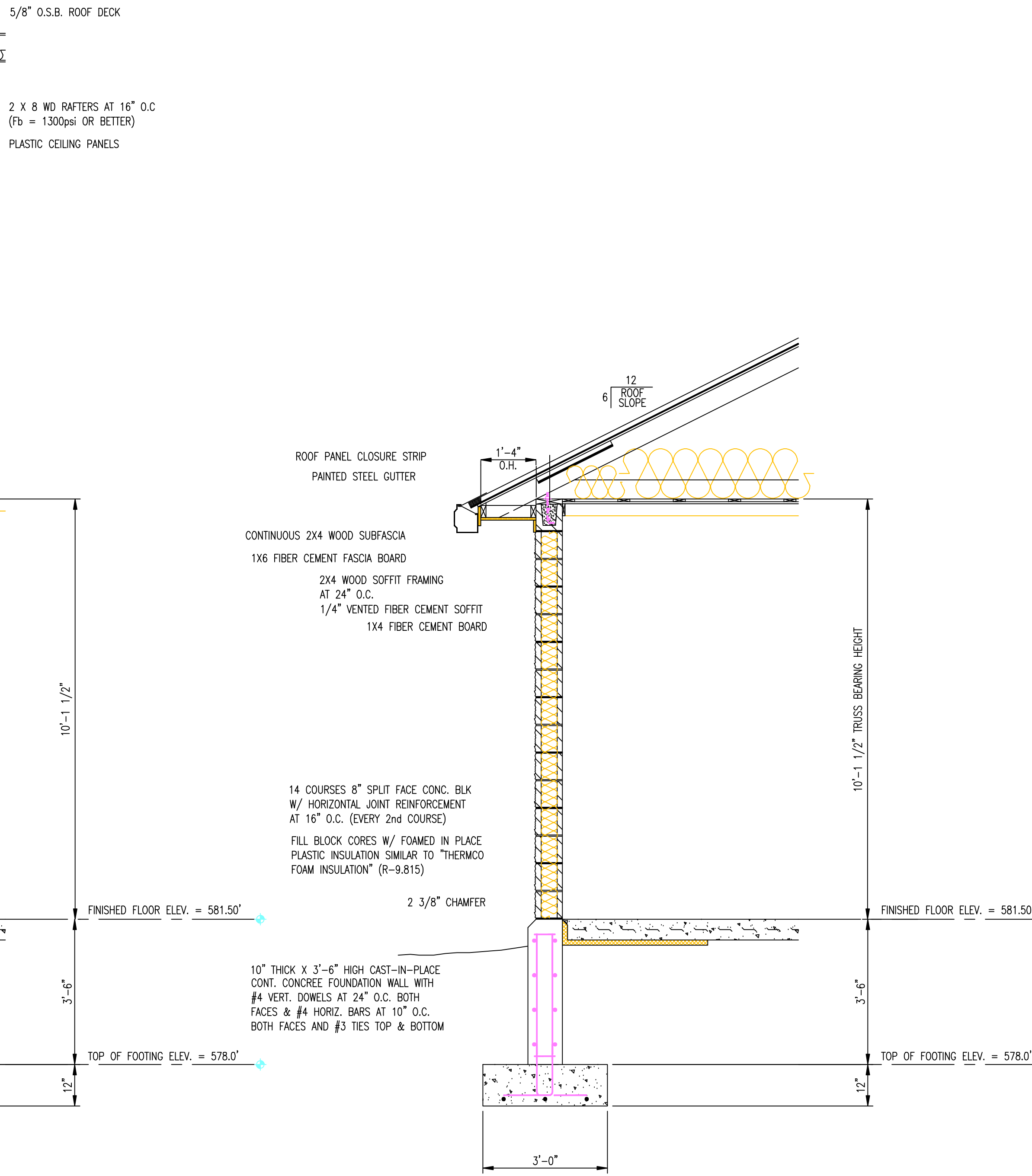
DATE: NOVEMBER 5, 2009 *Richard L. Battershell* DRAWN BY: REVISOR: **28 OF 36**



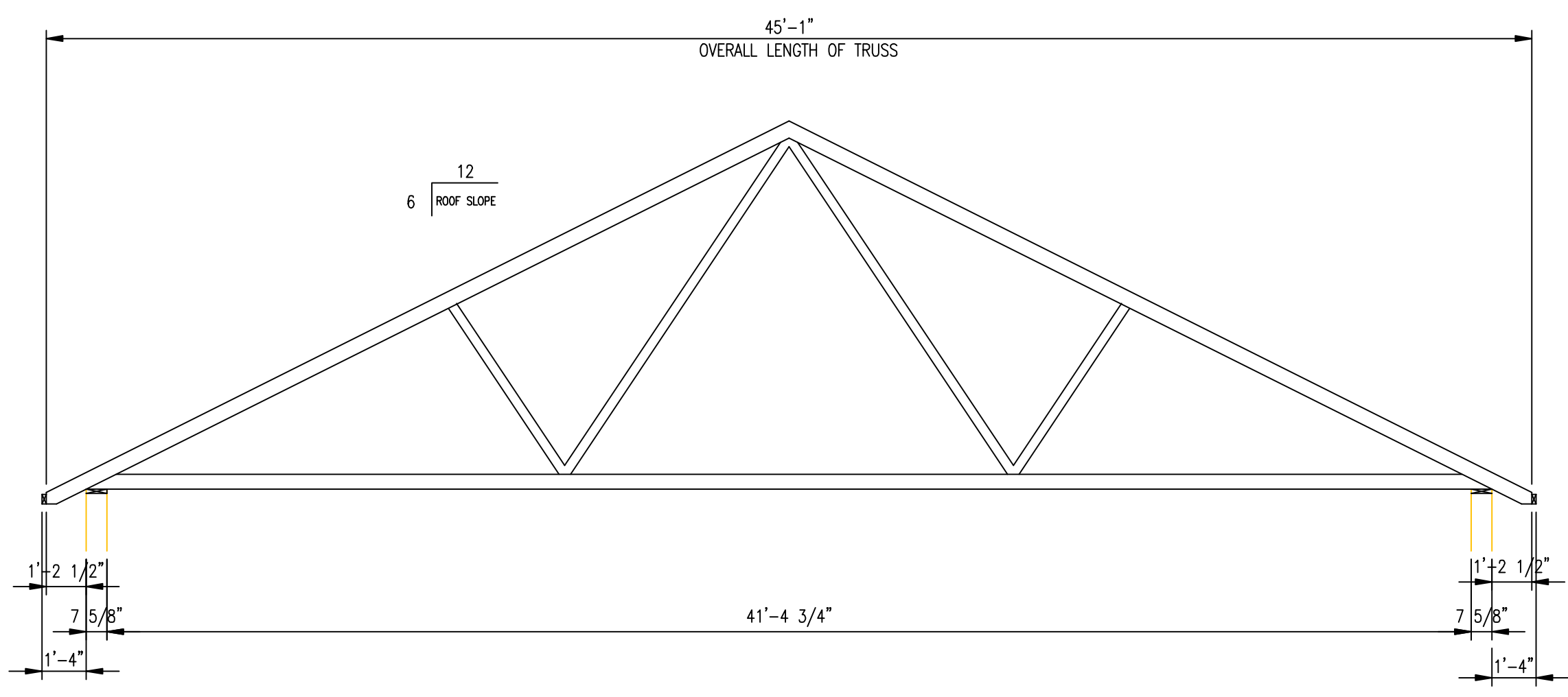
1 ROOF FRAMING PLAN
SCALE 1/4" = 1'-0"



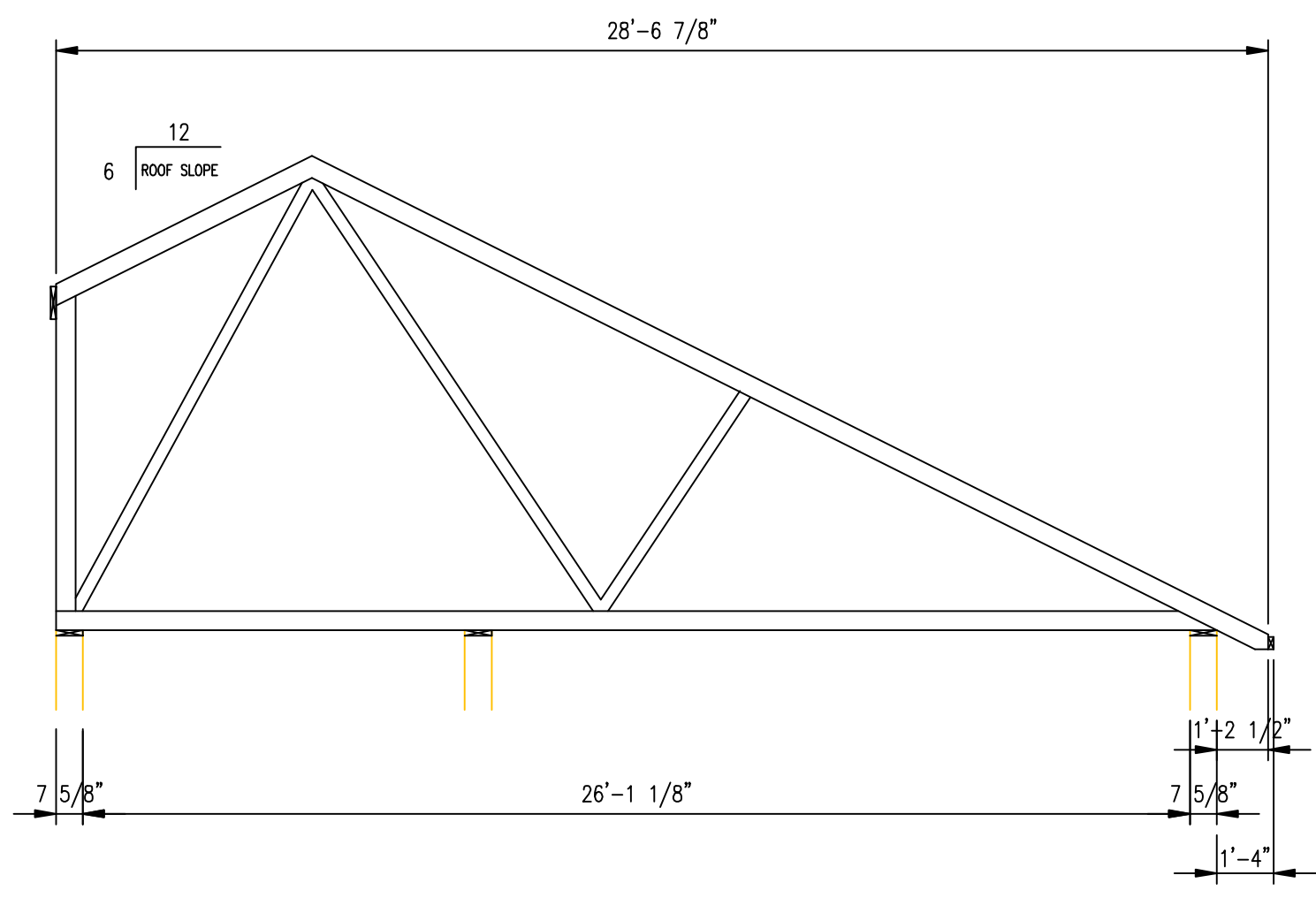
5 WALL SECTION AT BOOSTER STATION
GENERATOR ROOM
SCALE 1/2" = 1'-0"



3 TYPICAL BOOSTER STATION WALL SECTION
SCALE 1/2" = 1'-0"



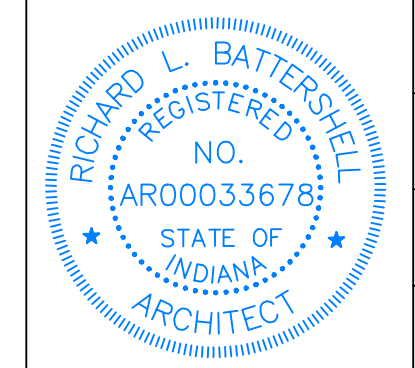
2 WOOD TRUSS ELEVATION 'C'
SCALE 1/4" = 1'-0"



4 WOOD TRUSS ELEVATION 'D'
SCALE 1/4" = 1'-0"

ROOF FRAMING NOTES:

1. ROOF TRUSS DESIGN LOADS: CHORD TOP CHORD LINE LOAD & WOOD DECK BACK OF WALL ARE SIMILAR TO 5' X 8' x 8' INNER SEAL OSP TO CORNER BOARD LOAD 40 PSF 10 PERCENT (8.0) PERMANENT LOAD, 10 PSF (2.0) WIND UPDRIFT LOAD, 10 PSF (2.0) WIND DOWNDRIFT LOAD, 10 PSF (2.0) WIND UPDRIFT LOAD, 40 PSF (8.0) TOTAL DESIGN LOAD. 40 PSF (8.0) TOTAL DESIGN LOAD. 40 PSF (8.0) TOTAL DESIGN LOAD. 40 PSF (8.0) TOTAL DESIGN LOAD.
2. CONNECTIONS: JOINTS OF ROOF TRUSSES SHALL BE GALVANNEALIZED STEEL OR GALVANIZED STEEL. GALVANNEALIZED STEEL SHALL BE THE LATEST PRINTED AND ADEQUATE SUPPORT DESIGN LOADS.
3. TRUSS MANUFACTURER: TRUSS TO BE MANUFACTURED BY THE ARCHITECT'S SHOP OR MANUFACTURER'S APPROVED MANUFACTURER. TRUSS MODEL L-1-LP OR FOR THE ROOF TRUSS SHALL BE APPROVED BY THE ARCHITECT'S SHOP OR MANUFACTURER'S APPROVED MANUFACTURER. TRUSS MANUFACTURER SHALL SUBMIT TRUSS DIMENSIONS AND DIMENSIONS TO THE ARCHITECT'S SHOP OR MANUFACTURER'S APPROVED MANUFACTURER. TRUSS MANUFACTURER SHALL SUBMIT TRUSS DIMENSIONS AND DIMENSIONS TO THE ARCHITECT'S SHOP OR MANUFACTURER'S APPROVED MANUFACTURER. TRUSS MANUFACTURER SHALL SUBMIT TRUSS DIMENSIONS AND DIMENSIONS TO THE ARCHITECT'S SHOP OR MANUFACTURER'S APPROVED MANUFACTURER. TRUSS MANUFACTURER SHALL SUBMIT TRUSS DIMENSIONS AND DIMENSIONS TO THE ARCHITECT'S SHOP OR MANUFACTURER'S APPROVED MANUFACTURER. TRUSS MANUFACTURER SHALL SUBMIT TRUSS DIMENSIONS AND DIMENSIONS TO THE ARCHITECT'S SHOP OR MANUFACTURER'S APPROVED MANUFACTURER.
4. TRUSS CONNECTIONS: TRUSS CONNECTIONS SHALL BE MADE IN ACCORDANCE WITH THE MANUFACTURER'S STANDARDS.
5. ALL CONNECTIONS SHALL BE MADE IN ACCORDANCE WITH THE MANUFACTURER'S STANDARDS.
6. CONNECTIONS TO EXISTING STRUCTURE SHALL BE MADE IN ACCORDANCE WITH THE MANUFACTURER'S STANDARDS.
7. UNAVAILABLE AND/OR UNOBTAINABLE MATERIALS SHALL BE SUBSTITUTED WITH EQUIVALENT MATERIALS OF EQUAL OR BETTER QUALITY AND PERFORMANCE. UNAVAILABLE AND/OR UNOBTAINABLE MATERIALS SHALL BE SUBSTITUTED WITH EQUIVALENT MATERIALS OF EQUAL OR BETTER QUALITY AND PERFORMANCE. UNAVAILABLE AND/OR UNOBTAINABLE MATERIALS SHALL BE SUBSTITUTED WITH EQUIVALENT MATERIALS OF EQUAL OR BETTER QUALITY AND PERFORMANCE.



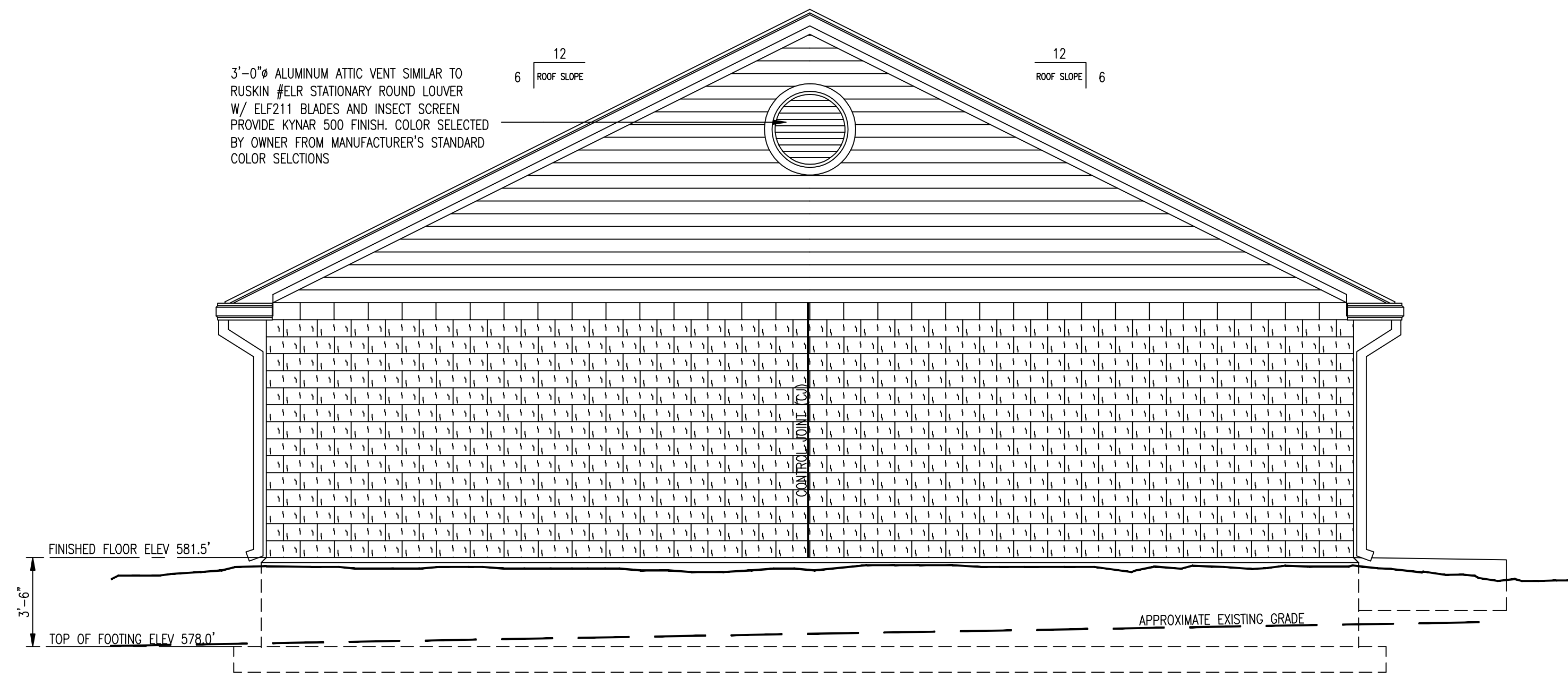
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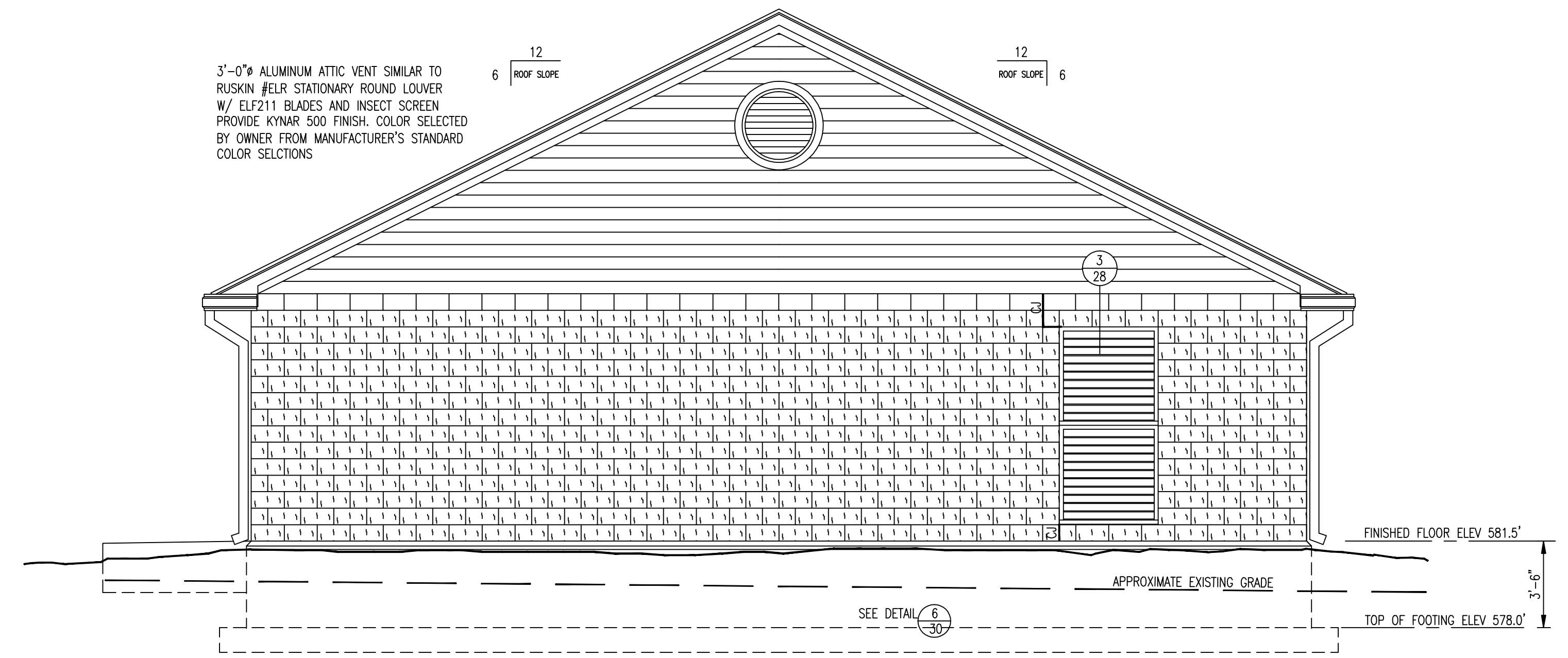
CHARLESTOWN STATE PARK
WATER SUPPLY IMPROVEMENTS
DIVISION II - WELLS, WTP & BOOSTER STATION

BOOSTER STATION ROOF FRAMING PLAN

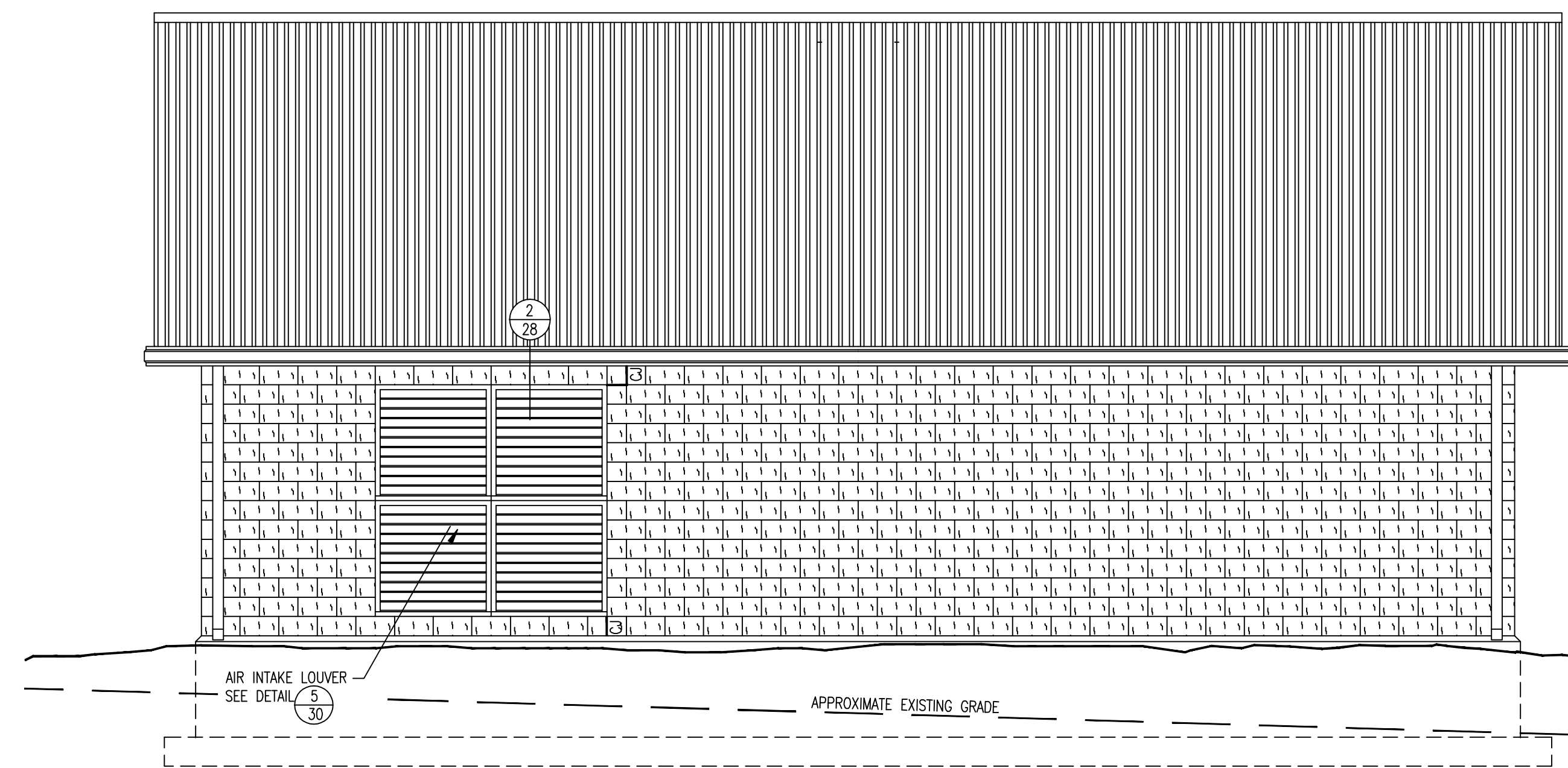
DATE: NOVEMBER 5, 2009
DRAWN BY: Richard L. Battershell
REVISED: []
DRAWING NUMBER: 29 OF 36



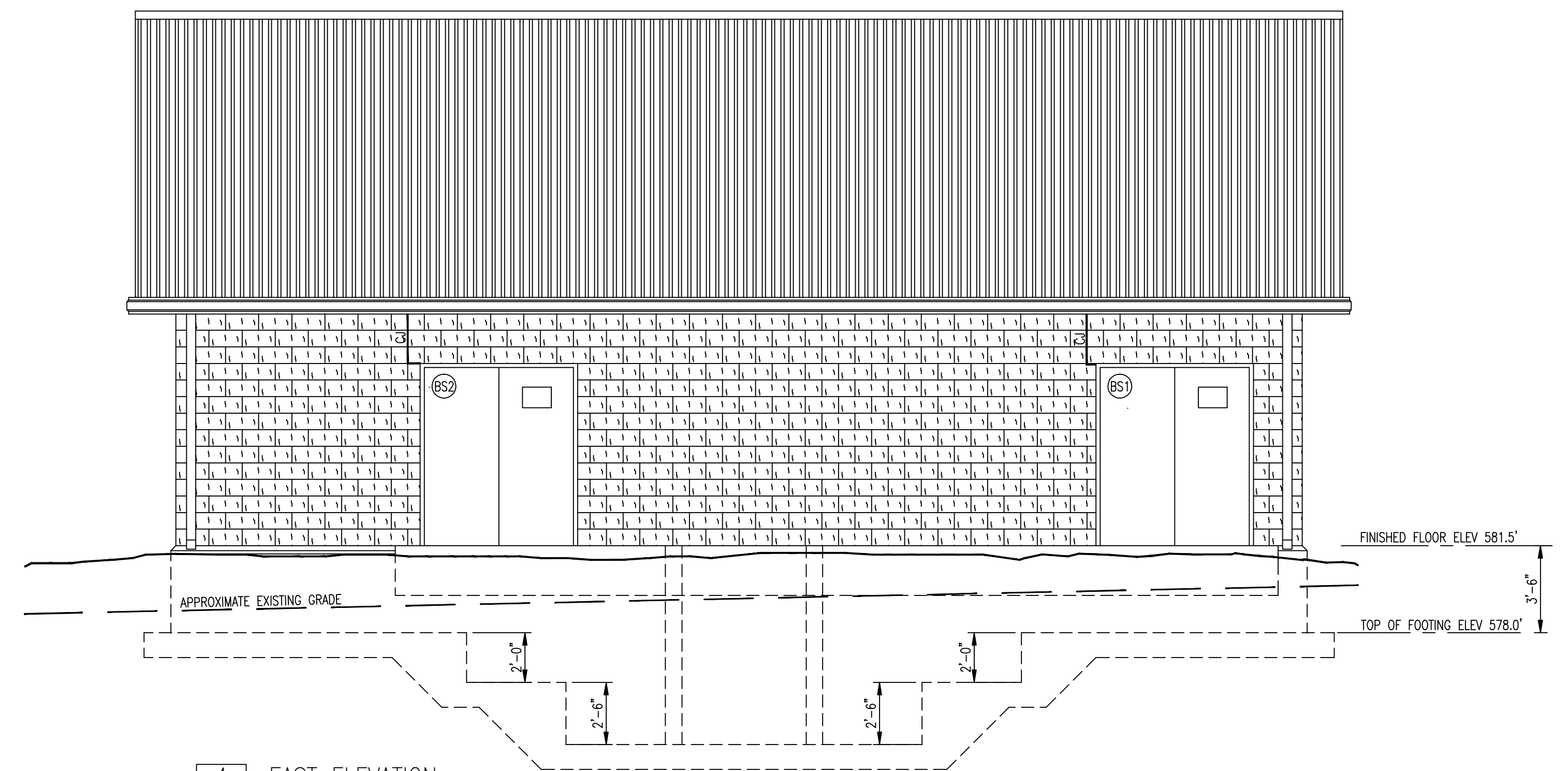
1 SOUTH ELEVATION
30 SCALE 1/4" = 1'-0"



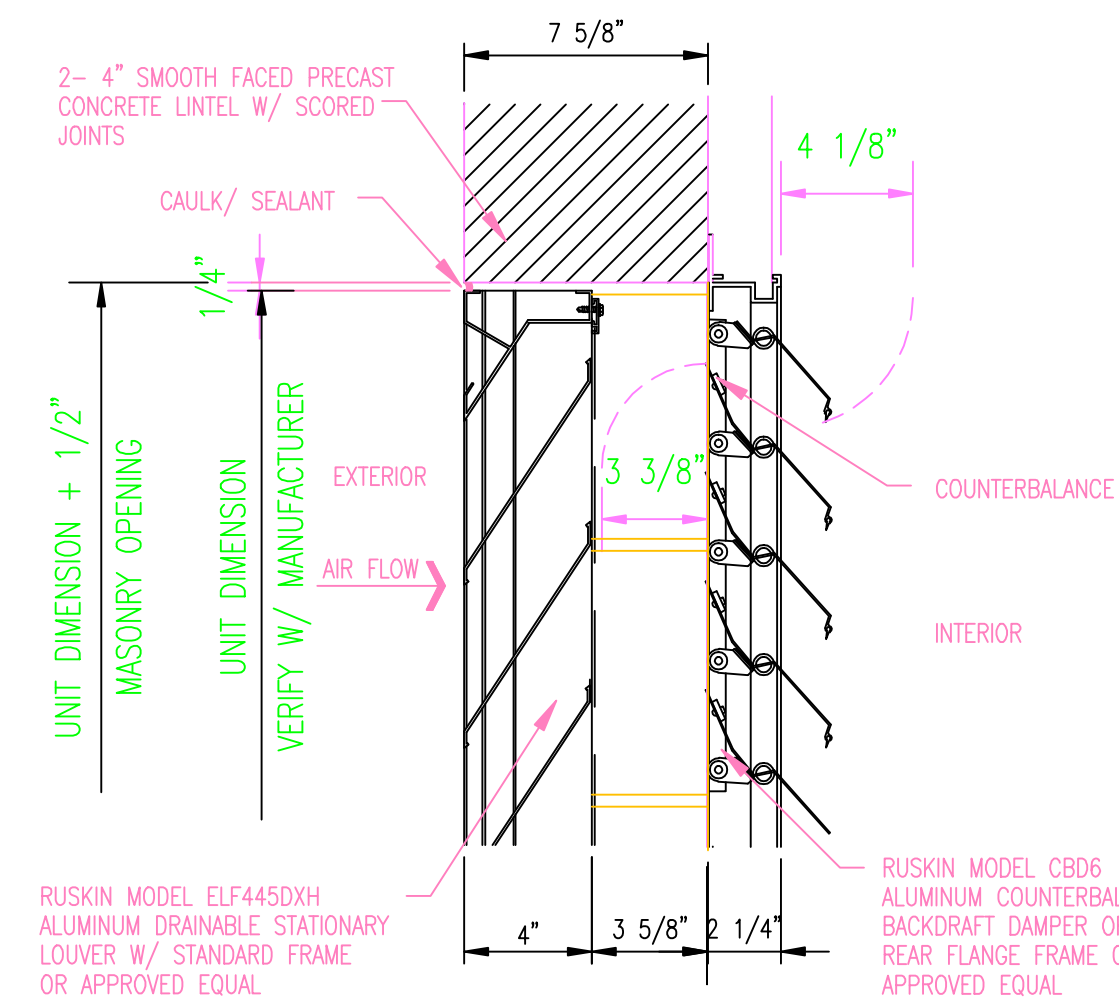
2 NORTH ELEVATION
30 SCALE 1/4" = 1'-0"



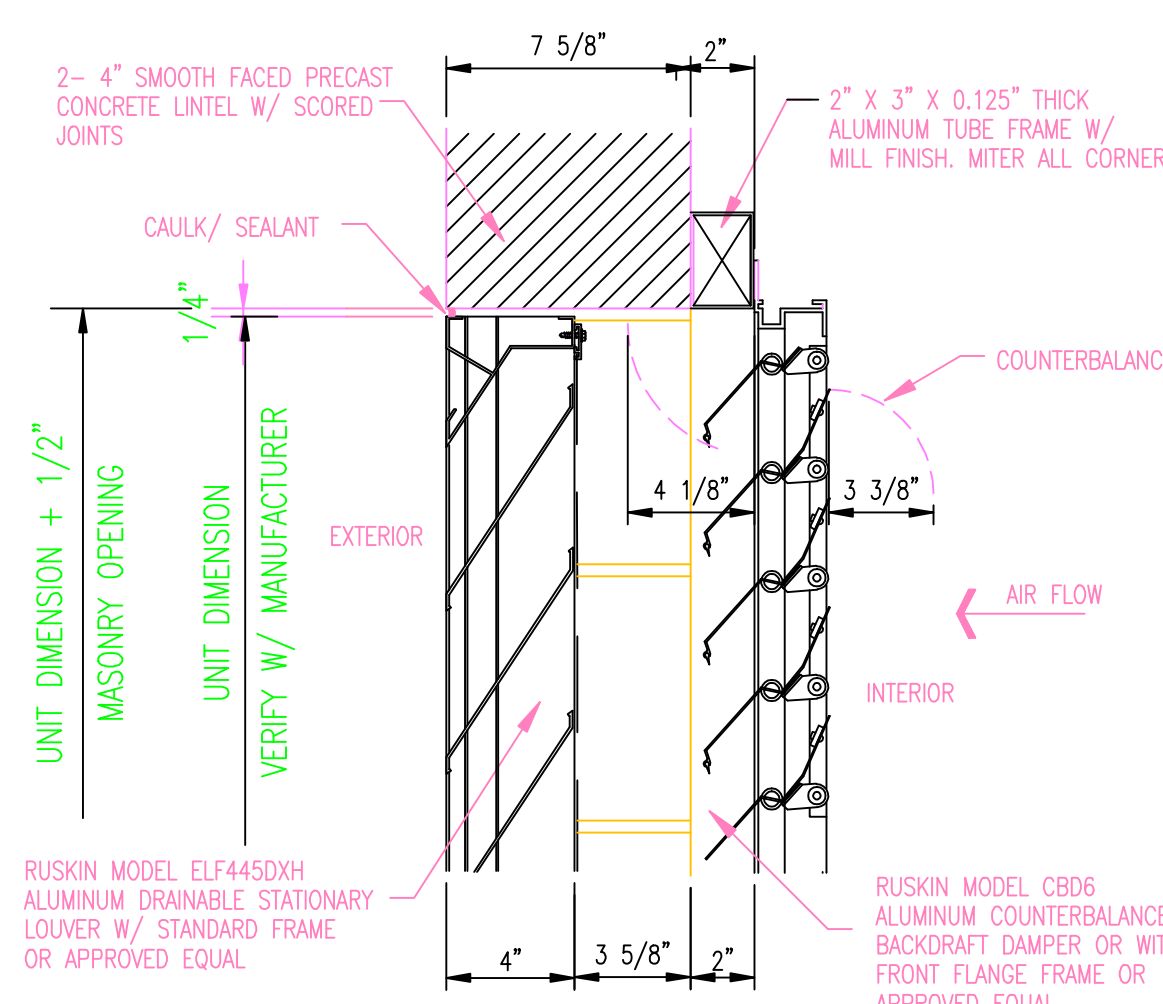
3 WEST ELEVATION
30 SCALE 1/4" = 1'-0"



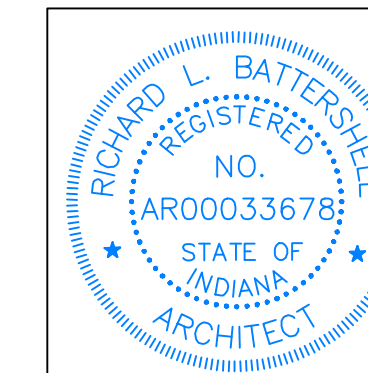
4 EAST ELEVATION
30 SCALE 1/4" = 1'-0"



5 SECTION DETAIL AT AIR INTAKE LOUVER
30 SCALE 1 1/2" = 1'-0"



6 SECTION DETAIL AT AIR EXHAUST LOUVER
30 SCALE 1 1/2" = 1'-0"



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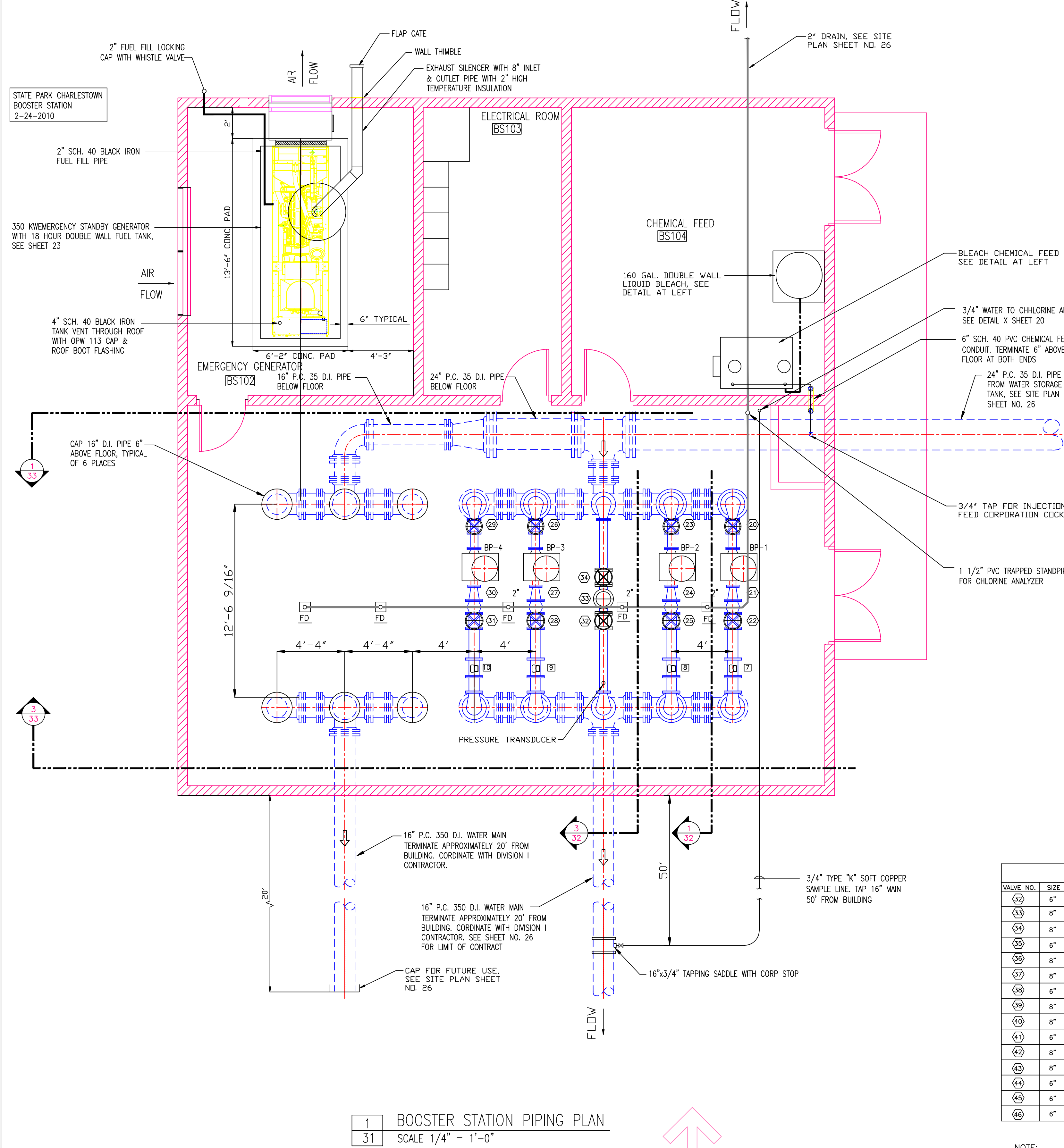
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WATER SUPPLY IMPROVEMENTS
DIVISION II - WELLS, WTP & BOOSTER STATION

BOOSTER STATION EXTERIOR ELEVATIONS

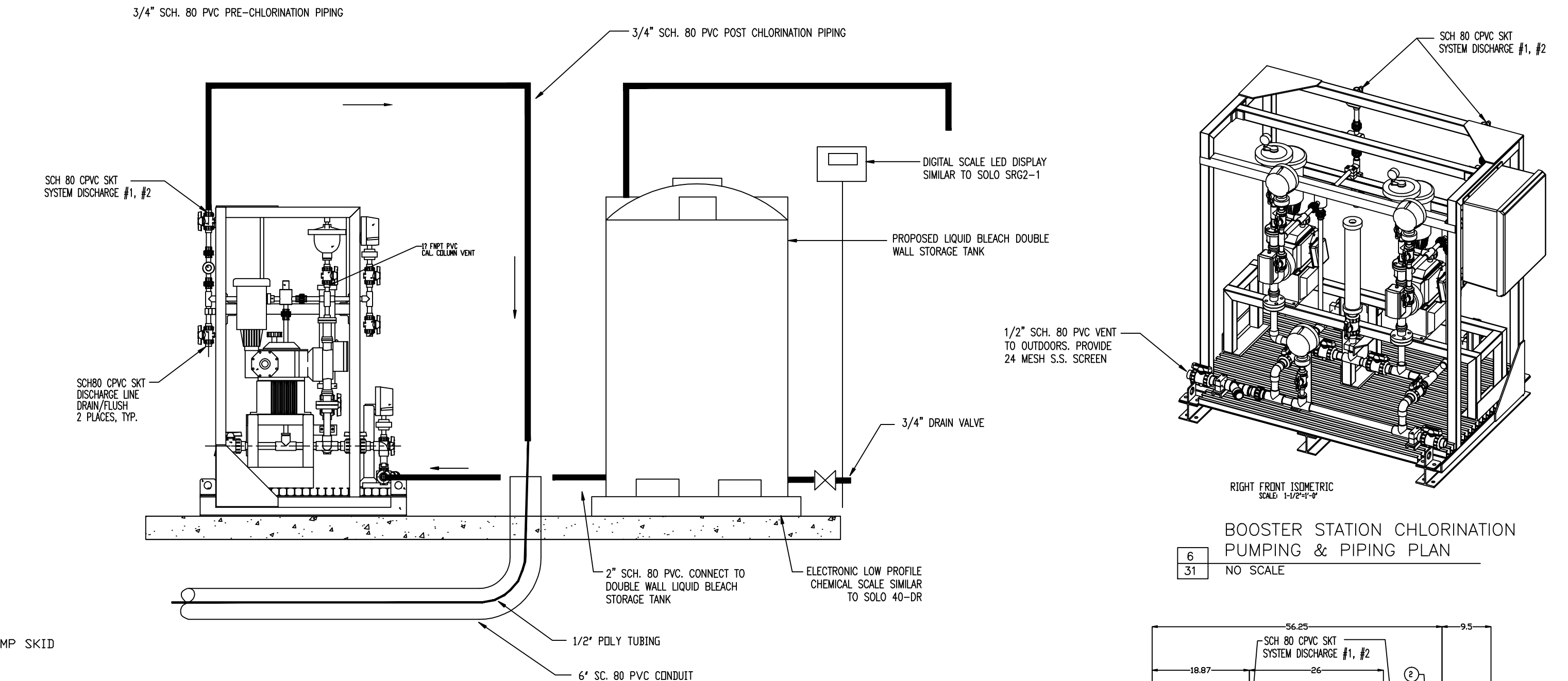
DATE: NOVEMBER 5, 2009 *Richard L. Battershell* DRAWING NUMBER: 30 OF 36

BOOSTER STATION WATER METER SCHEDULE											
METER NO.	SIZE	ENDS	TYPE	BOOSTER STATION LOCATION	FUNCTION	PRESSURE RATING	FLOW RATE	SIGNAL	POWER	EQUAL TO MODEL NUMBER	
7	8"	FLANGED	MAG	BOOSTER PUMP NO. 1 DISCHARGE	FINISHED WATER	150 PSI	110-4,400 GPM	4-20 mA TO SCADA	120V, 1 PHASE	SIEMENS SITRANS FM MAGFLO NO. 5100W	
8	8"	FLANGED	MAG	BOOSTER PUMP NO. 2 DISCHARGE	FINISHED WATER	150 PSI	110-4,400 GPM	4-20 mA TO SCADA	120V, 1 PHASE	SIEMENS SITRANS FM MAGFLO NO. 5100W	
9	8"	FLANGED	MAG	BOOSTER PUMP NO. 3 DISCHARGE	FINISHED WATER	150 PSI	110-4,400 GPM	4-20 mA TO SCADA	120V, 1 PHASE	SIEMENS SITRANS FM MAGFLO NO. 5100W	
10	8"	FLANGED	MAG	BOOSTER PUMP NO. 4 DISCHARGE	FINISHED WATER	150 PSI	110-4,400 GPM	4-20 mA TO SCADA	120V, 1 PHASE	SIEMENS SITRANS FM MAGFLO NO. 5100W	

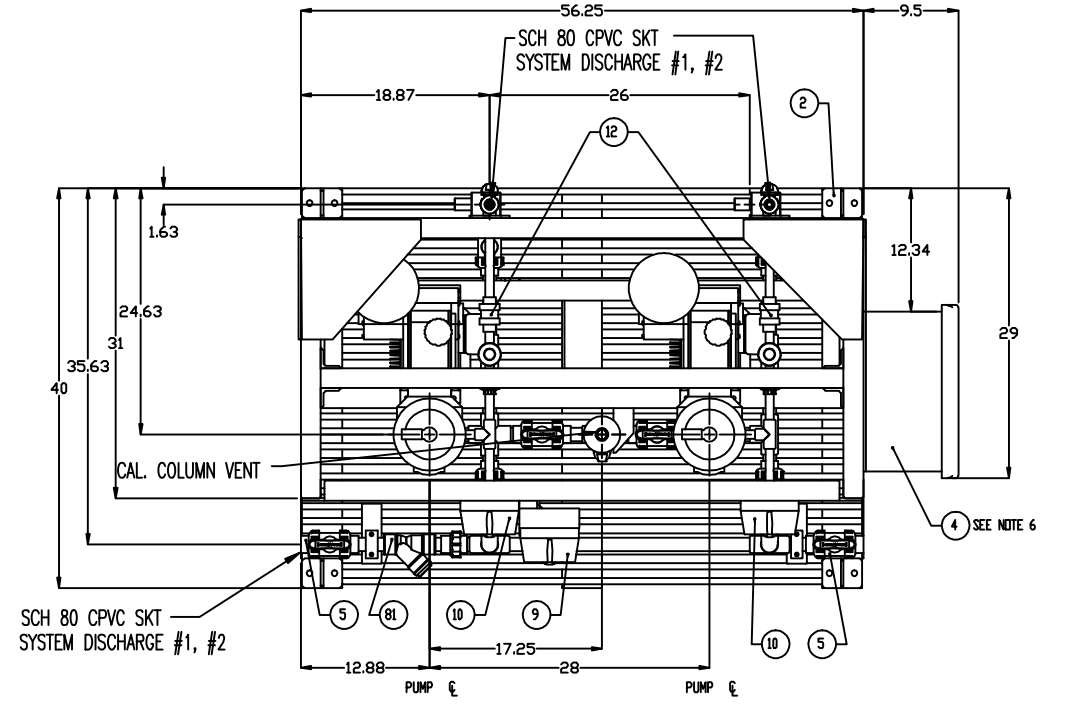
NOTE:
1. SEE WATER TREATMENT PLANT METER SCHEDULE AND SPECIFICATION SECTION 15300 FOR ADDITIONAL METERS FOR THIS PROJECT



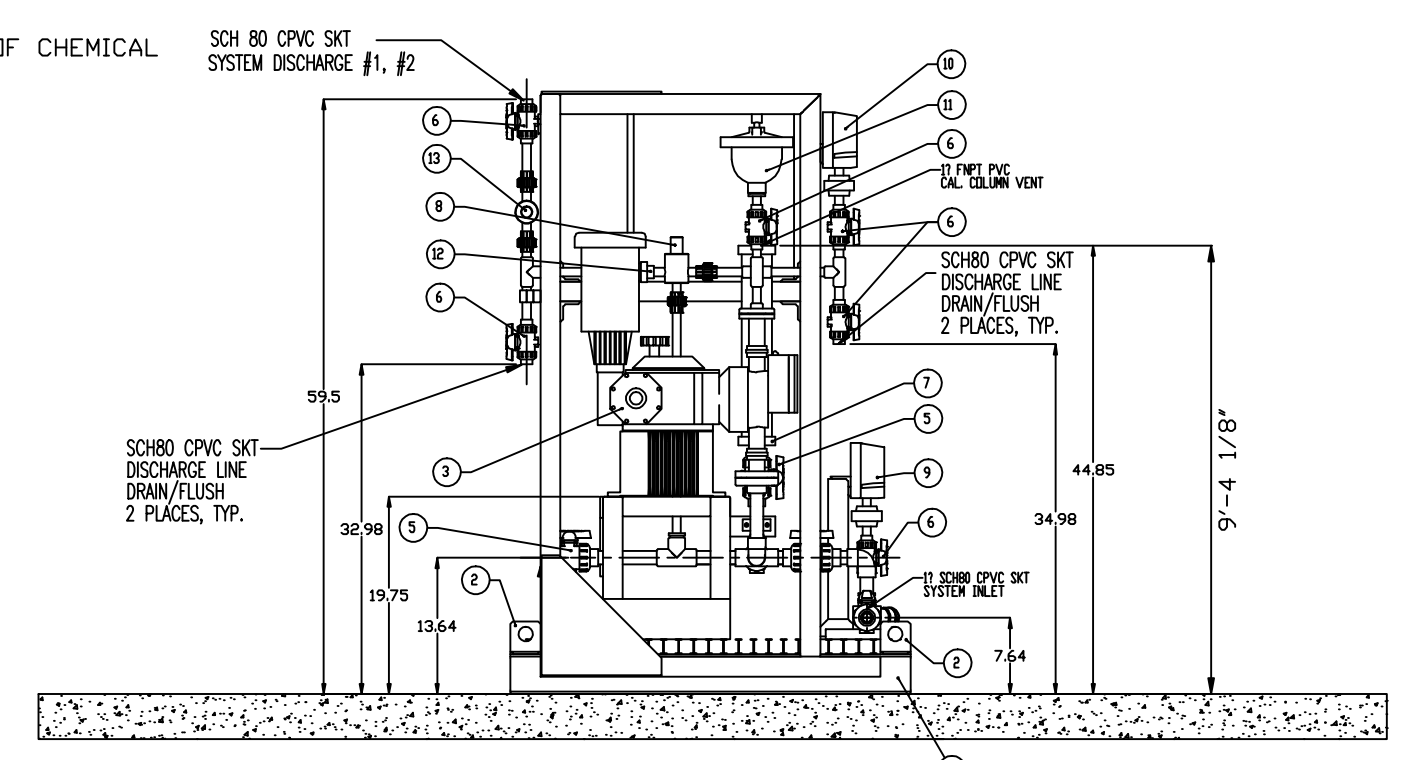
1
31 BOOSTER STATION PIPING PLAN
SCALE 1/4" = 1'-0"



2
31 BOOSTER STATION CHLORINATION PUMPING & PIPING LEFT ELEVATION
NO SCALE



3
31 BOOSTER STATION CHLORINATION PUMPING & PIPING PLAN
NO SCALE



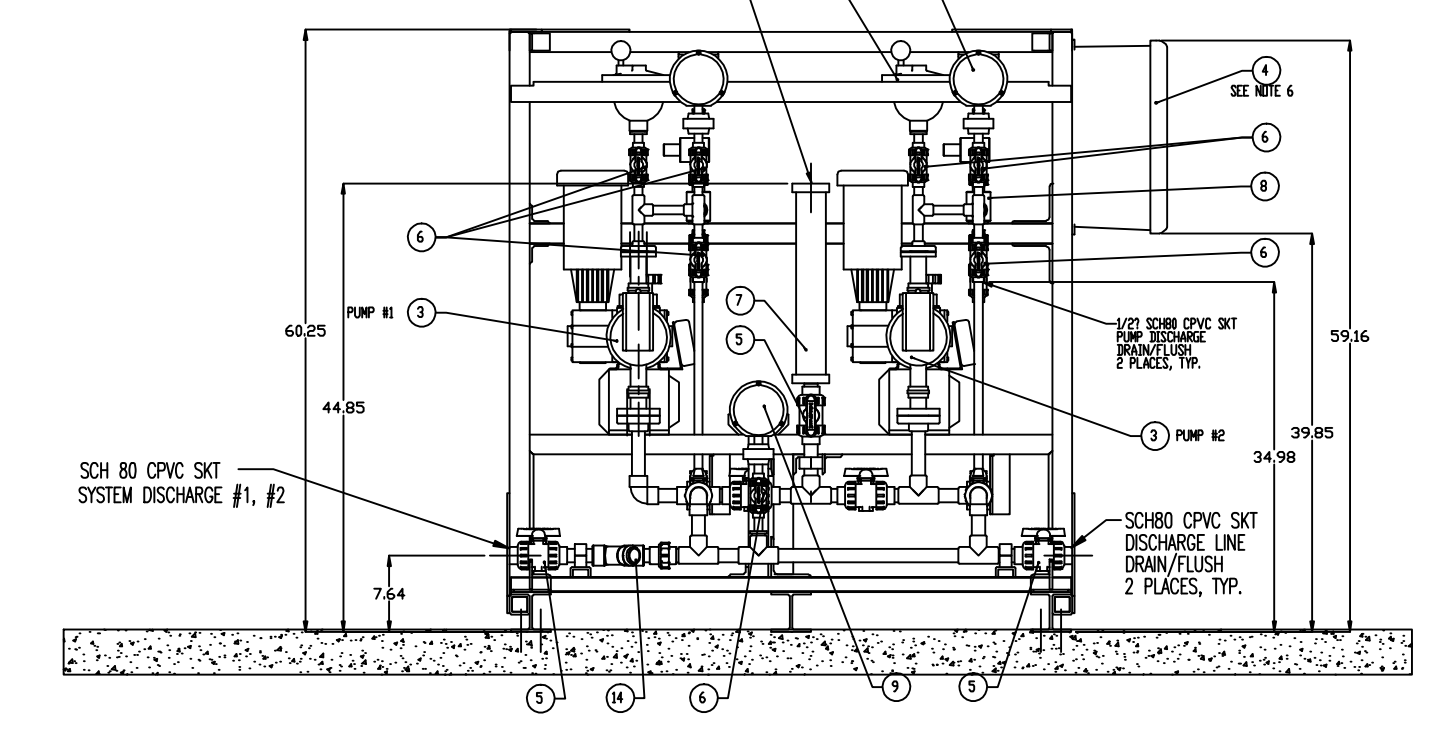
3
31 BOOSTER STATION CHLORINATION PUMPING & PIPING LEFT ELEVATION
NO SCALE

BOOSTER STATION VALVE SCHEDULE											
VALVE NO.	SIZE	ENDS	TYPE	FUNCTION	OPERATION	AWWA NUMBER	MODEL NUMBER				
32	6"	FLANGED	RESILIENT SEAT GATE VALVE	BOOSTER PUMP NO. 1 SUCTION	GEAR OPERATED HANDWHEEL	AWWA C509, CLASS 150B, ANSI A21.11, B16.1	M&H 4067-02				
33	8"	FLANGED	GLOBE STYLE CHECK VALVE	BOOSTER PUMP NO. 1 DISCHARGE	SPRING WITH DISC	ASTM 60-45-10, ASTM A536 BODY	APCO 608				
34	8"	FLANGED	RESILIENT SEAT GATE VALVE	BOOSTER PUMP NO. 1 DISCHARGE	GEAR OPERATED HANDWHEEL	AWWA C509, CLASS 150B, ANSI A21.11, B16.1	M&H 4067-02				
35	6"	FLANGED	RESILIENT SEAT GATE VALVE	BOOSTER PUMP NO. 2 SUCTION	GEAR OPERATED HANDWHEEL	AWWA C509, CLASS 150B, ANSI A21.11, B16.1	M&H 4067-02				
36	8"	FLANGED	GLOBE STYLE CHECK VALVE	BOOSTER PUMP NO. 2 DISCHARGE	SPRING WITH DISC	ASTM 60-45-10, ASTM A536 BODY	APCO 608				
37	8"	FLANGED	RESILIENT SEAT GATE VALVE	BOOSTER PUMP NO. 2 DISCHARGE	GEAR OPERATED HANDWHEEL	AWWA C509, CLASS 150B, ANSI A21.11, B16.1	M&H 4067-02				
38	6"	FLANGED	RESILIENT SEAT GATE VALVE	BOOSTER PUMP NO. 3 SUCTION	GEAR OPERATED HANDWHEEL	AWWA C509, CLASS 150B, ANSI A21.11, B16.1	M&H 4067-02				
39	8"	FLANGED	GLOBE STYLE CHECK VALVE	BOOSTER PUMP NO. 3 DISCHARGE	SPRING WITH DISC	ASTM 60-45-10, ASTM A536 BODY	APCO 608				
40	8"	FLANGED	RESILIENT SEAT GATE VALVE	BOOSTER PUMP NO. 3 DISCHARGE	GEAR OPERATED HANDWHEEL	AWWA C509, CLASS 150B, ANSI A21.11, B16.1	M&H 4067-02				
41	6"	FLANGED	RESILIENT SEAT GATE VALVE	BOOSTER PUMP NO. 4 SUCTION	GEAR OPERATED HANDWHEEL	AWWA C509, CLASS 150B, ANSI A21.11, B16.1	M&H 4067-02				
42	8"	FLANGED	GLOBE STYLE CHECK VALVE	BOOSTER PUMP NO. 4 DISCHARGE	SPRING WITH DISC	ASTM 60-45-10, ASTM A536 BODY	APCO 608				
43	8"	FLANGED	RESILIENT SEAT GATE VALVE	BOOSTER PUMP NO. 4 DISCHARGE	GEAR OPERATED HANDWHEEL	AWWA C509, CLASS 150B, ANSI A21.11, B16.1	M&H 4067-02				
44	6"	FLANGED	RESILIENT SEAT GATE VALVE	PRESSURE RELIEF ISOLATION	GEAR OPERATED HANDWHEEL	AWWA C509, CLASS 150B, ANSI A21.11, B16.1	M&H 4067-02				
45	6"	FLANGED	PUMP DISCHARGE PRESSURE RELIEF	PRESSURE RELIEF	HYDRAULIC	ASTM A536, CLASS 150B, ANSI B16.42	QAPCO/M&H-660-11				
46	6"	FLANGED	RESILIENT SEAT GATE VALVE	PRESSURE RELIEF ISOLATION	GEAR OPERATED HANDWHEEL	AWWA C509, CLASS 150B, ANSI A21.11, B16.1	M&H 4067-02				

NOTE:
1. SEE WATER TREATMENT PLANT VALVE SCHEDULE FOR ADDITIONAL VALVES FOR THIS PROJECT
2. VALVES SHOWN ABOVE ARE FOR 4" AND LARGER VALVES ONLY

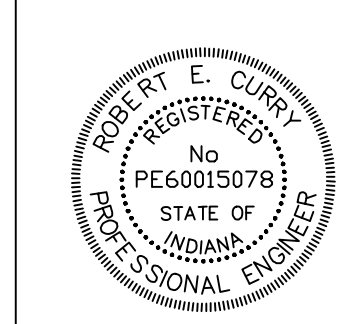
14	1"	STRAINER	SKID, CPVC/PP	1
15	1/2"	VALVE/BLOCK PRESSURE	1/2" SKID 150B CPVC	2
16	1/2"	VALVE/DECK	1/2" SKID CPVC/PP	2
17	1"	PULSATON DAMPENER	1" SKID, PVC/VITON	2
18	1/2"	GLOBE PRESS	1/2" SKID PVC/PP	2
19	3/4"	GLOBE PRESS	3/4" SKID PVC/PP	2
20	1/2"	VALVE, PRESS. RELIEF	1/2" SKID, PTFE/EP-S	2
21	1/2"	CALIBRATION COLUMN	2000, 1/2" PVC	1
22	1/2"	VALVE/BALL	1/2" TRUE UNION/2" SKID CPVC/PP	11
23	1/2"	VALVE/BALL	1/2" TRUE UNION/2" SKID CPVC/PP	11
24	1/2"	PANEL/2-PMP	MFC NEW 4X FRP	1
25	1/2"	PULS. MODEL	2500, 1/2" SKID 150B 1/2" MOTOR	2
26	1/2"	LIFTING LUG	3/4" X 1/2" X 1/2" HOLE, 304SS	4
27	1/2"	SKID, 2 2500 PUMPS	FRP	1
28	1/2"	DESCRIPTION		101

- NOTES:
- FRAME CONSTRUCTION: FIBERGLASS GRIP STRUCTURAL DWIGES
 - PIPE AND FITTING CONSTRUCTION: SOLVENT WELDED SCHEDULE 80 CPVC WITH VITON ELASTOMERS. CLEAR PVC PIPING SHALL BE USED IN ALL PIPING CONNECTIONS, AND FROM THE 15-STRAINER TO THE PUMP SECTION
 - ALL PIPE SUPPORTS, BRACKETS AND CLAMPS ARE SHOWN APPROXIMATELY AND ALL ARE SHOWN. ADDITIONAL PIPE SUPPORTS SHALL BE PROVIDED AS REQUIRED TO PROPERLY SUPPORT THE PIPING AND APPROPRIATELY DURING SYSTEM TESTING
 - PANEL/2-PMP PIPE AND TUBING CLAMPS ARE USED FOR RETAINING PIPE ASSEMBLY TO MINIMIZE UNWANTED EFFECTS OF MECHANICAL SHOCK AND VIBRATION FORCES.
 - DIMENSIONAL TOLERANCE 1/16" INCH
 - SKID, MINIMUM CLEARANCE REQUIRED IN FRONT OF MFC ACTION BOX
 - APPROXIMATE WEIGHT = 4750 LBS, 2500 OPERATING
 - ALL BALL VALVES, ITEM #5 & 6, SHALL BE INTERNALLY VENTED.



4
31 BOOSTER STATION CHLORINATION PUMPING & PIPING LEFT ELEVATION
NO SCALE

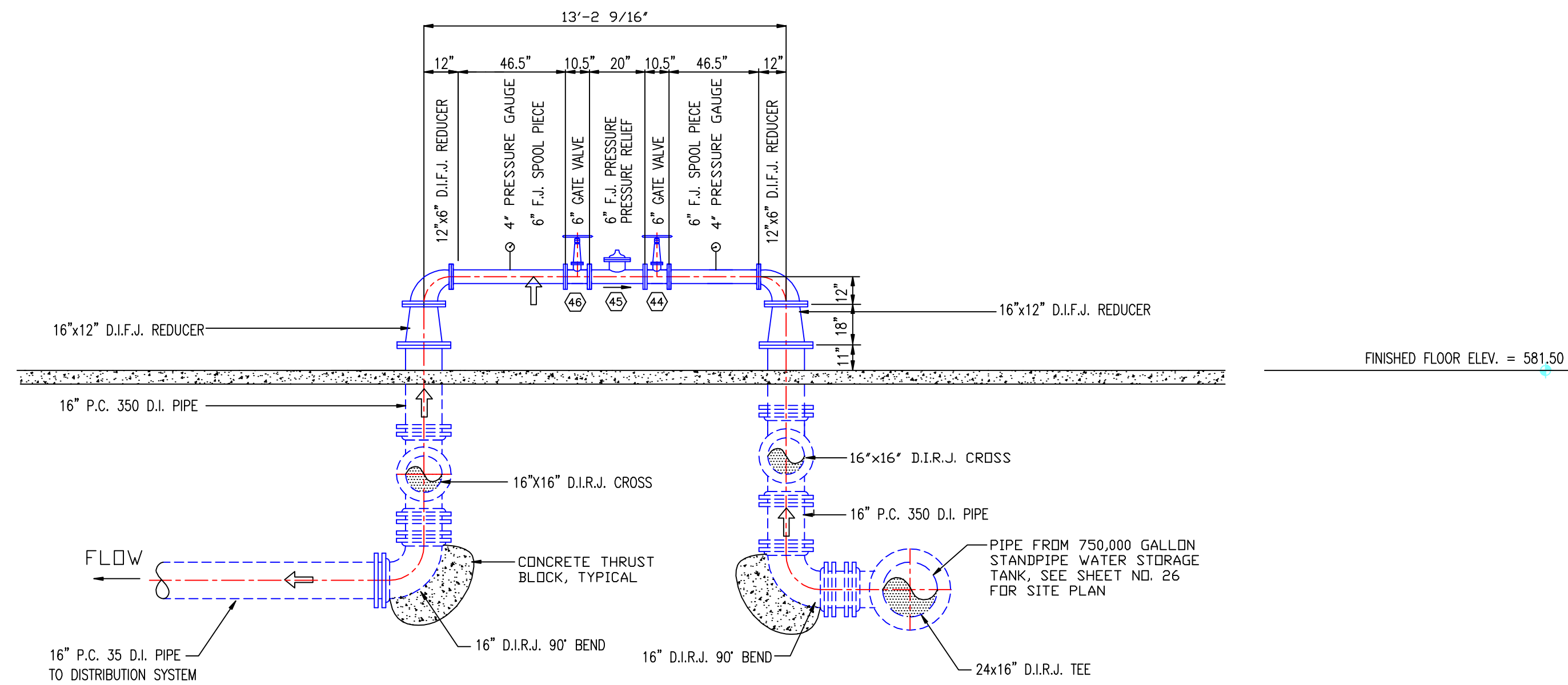
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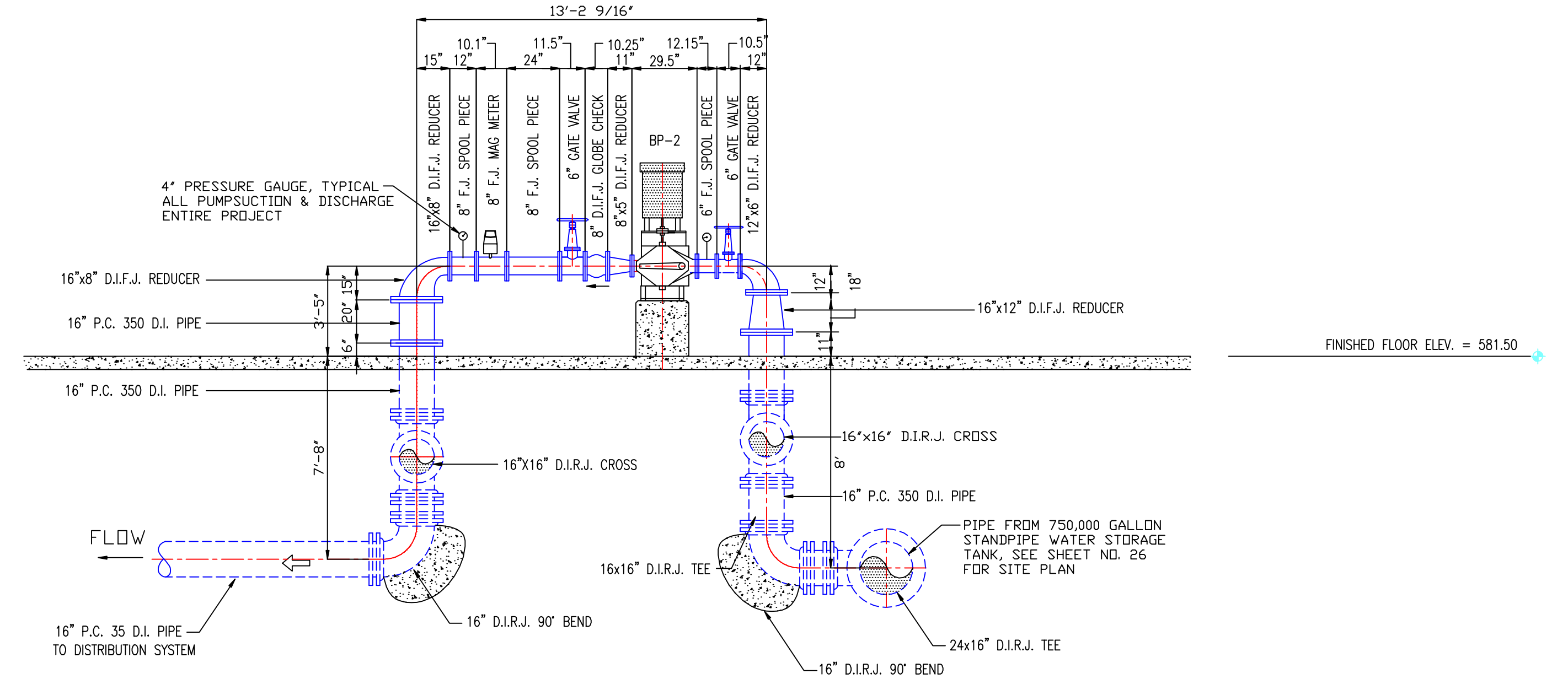
INDIANA DEPARTMENT OF NATURAL RESOURCES
D.A.P.W. PROJECT NO. E030094
CHARLESTOWN STATE PARK
WATER SUPPLY IMPROVEMENTS
DIVISION II-WELLS, WTP & BOOSTER STATION
BOOSTER STATION PIPING PLAN
DATE: _____ APPROVED BY: _____ DRAWING NUMBER: 31 OF 36

BOOSTER STATION PUMP SCHEDULE

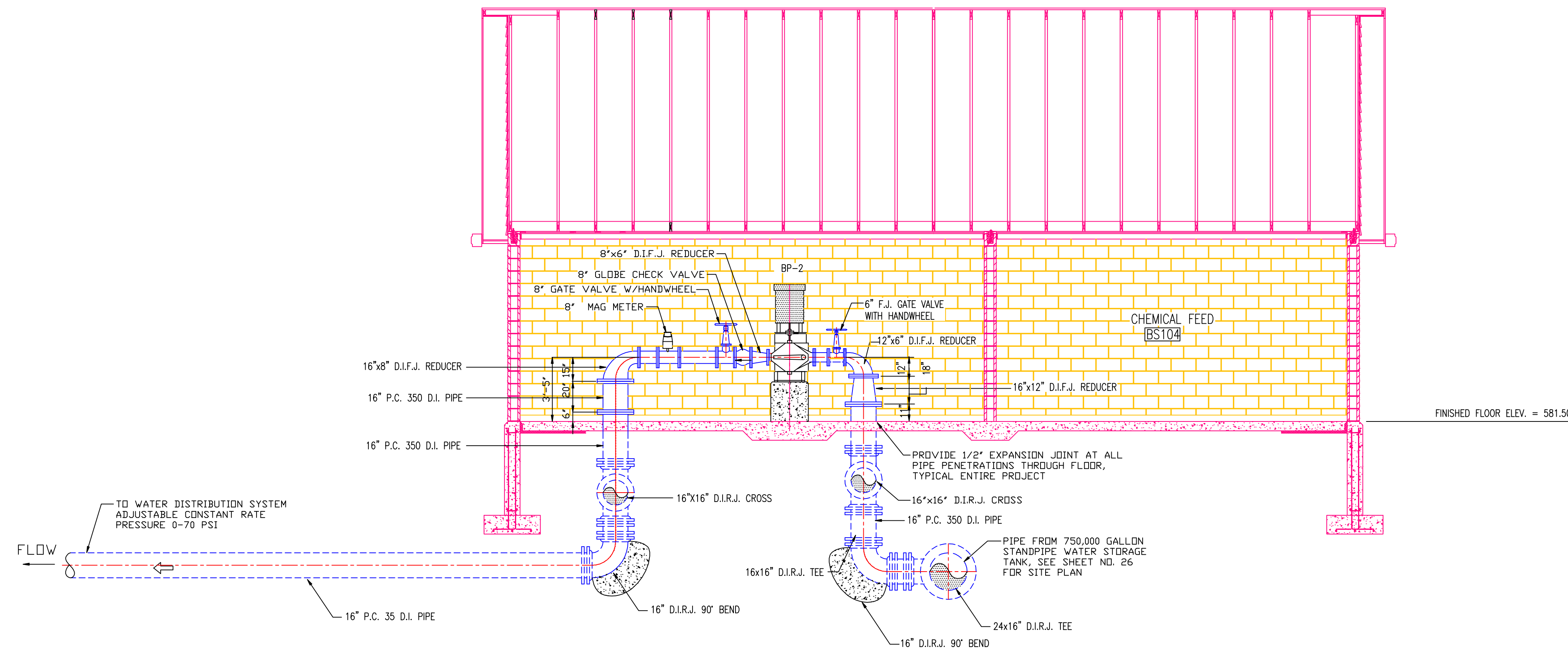
PUMP DATA										MOTOR DATA				
PUMP NO.	PUMP NAME	FLOW RATE	TDH	RPM	MFG	MODEL NO.	PUMP SIZE	TYPE	HP	VOLTAGE	PHASE	TYPE MOTOR	MFG.	CONTROL
1	BOOSTER PUMP NO. 1	0-1,000 GPM	160'	1800	AMERICAN MARSH	340	5x6x15HD	SPLIT-CASE	75	480	3	VERT. HOLLOW SHAFT	U.S.	V.F.D.
2	BOOSTER PUMP NO. 2	1,000 GPM	160'	1800	AMERICAN MARSH	340	5x6x15HD	SPLIT-CASE	75	480	3	VERT. HOLLOW SHAFT	U.S.	SOLID STATE SOFT START
3	BOOSTER PUMP NO. 3	0-1,000 GPM	160'	1800	AMERICAN MARSH	340	5x6x15HD	SPLIT-CASE	75	480	3	VERT. HOLLOW SHAFT	U.S.	V.F.D.
4	BOOSTER PUMP NO. 4	1,000 GPM	160'	1800	AMERICAN MARSH	340	5x6x15HD	SPLIT-CASE	75	480	3	VERT. SOLID SHAFT	U.S.	SOLID STATE SOFT START



3 PRESSURE RELIEF PIPING SECTION
32 SCALE 1/4" = 1'-0"



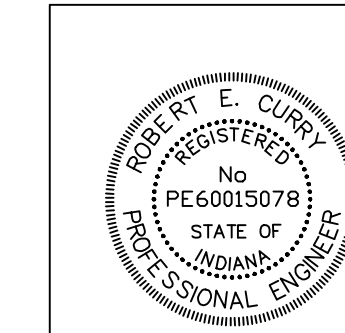
2 BOOSTER STATION PIPING SECTION
32 SCALE 1/4" = 1'-0"



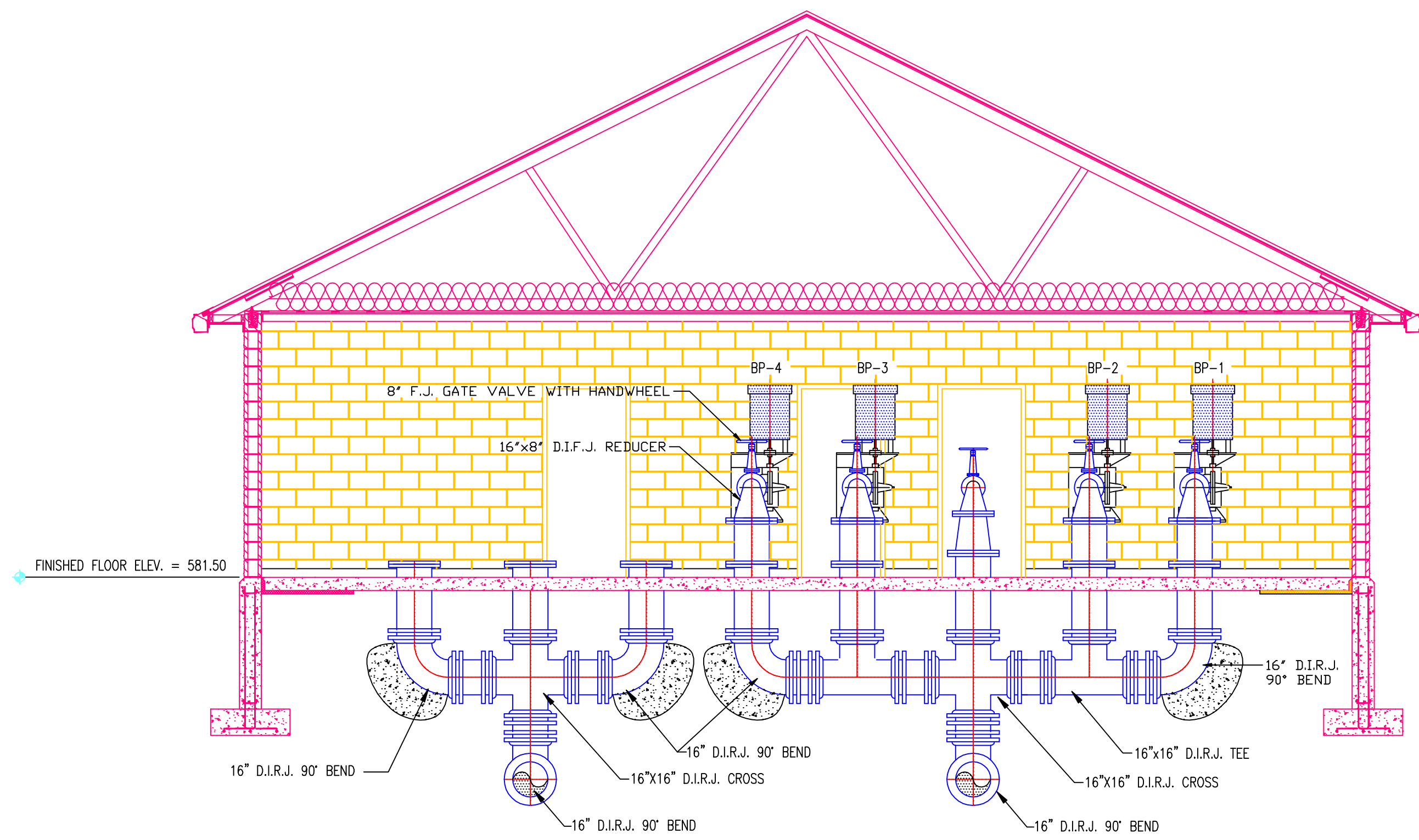
1 BOOSTER STATION PIPING SECTION
32 SCALE 1/4" = 1'-0"

NOTE:
ALL PIPING ABOVE FLOOR SLAB IN BOOSTER STATION SHALL BE FLANGED ENDS. ALL PIPING & FITTINGS BELOW FLOOR SLAB AT BOOSTER STATION SHALL BE PRESSURE CLASS 350 DUCTILE IRON RESTRAINED MECHANICAL JOINT. ALL FITTINGS SHALL ALSO HAVE CONCRETE THRUST BLOCKS

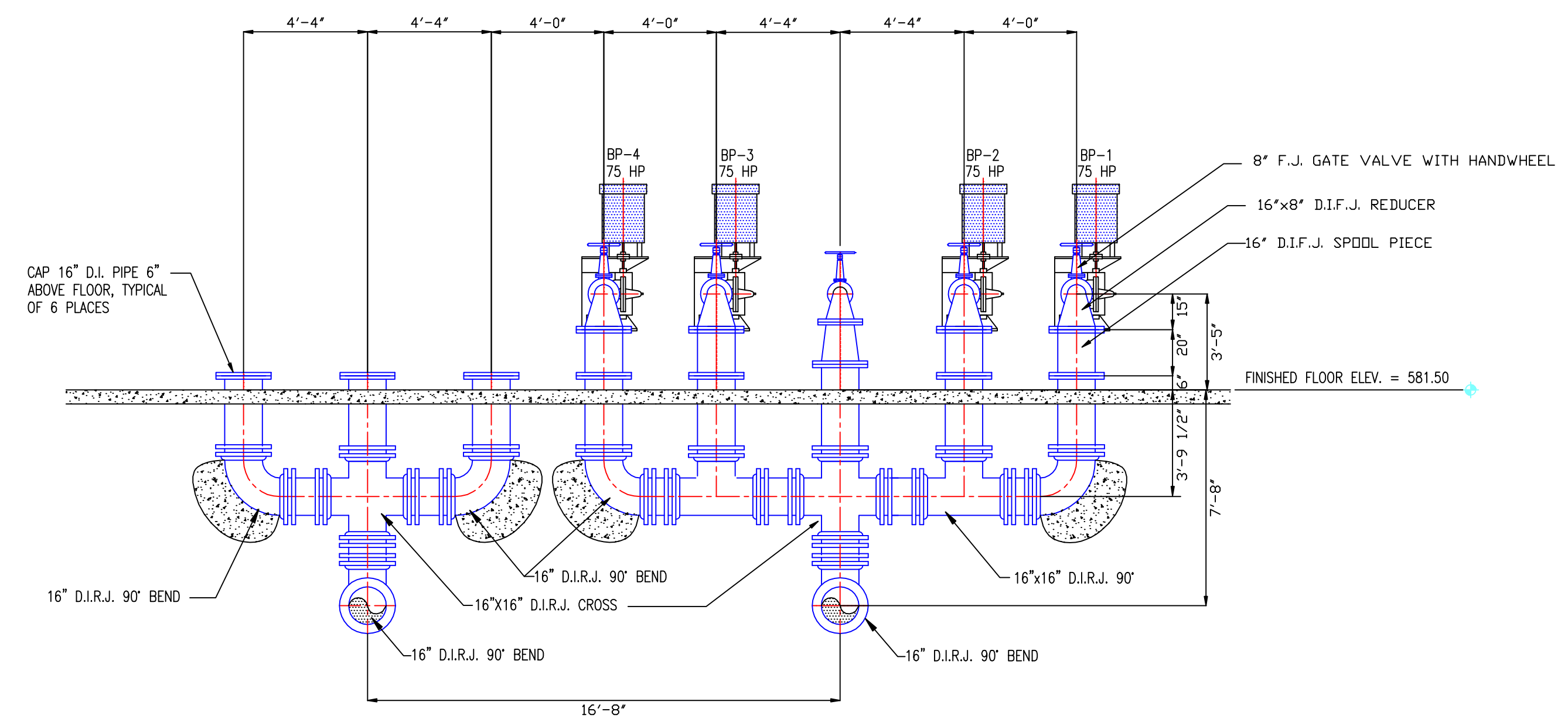
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CHARLESTOWN STATE PARK
WATER SUPPLY IMPROVEMENTS
DIVISION II—WELLS, WTP & BOOSTER STATION
BOOSTER STATION PIPING & PUMP SECTIONS
DATE: NOVEMBER 5, 2009 APPROVED BY: DRAWING NUMBER: 32 OF 36

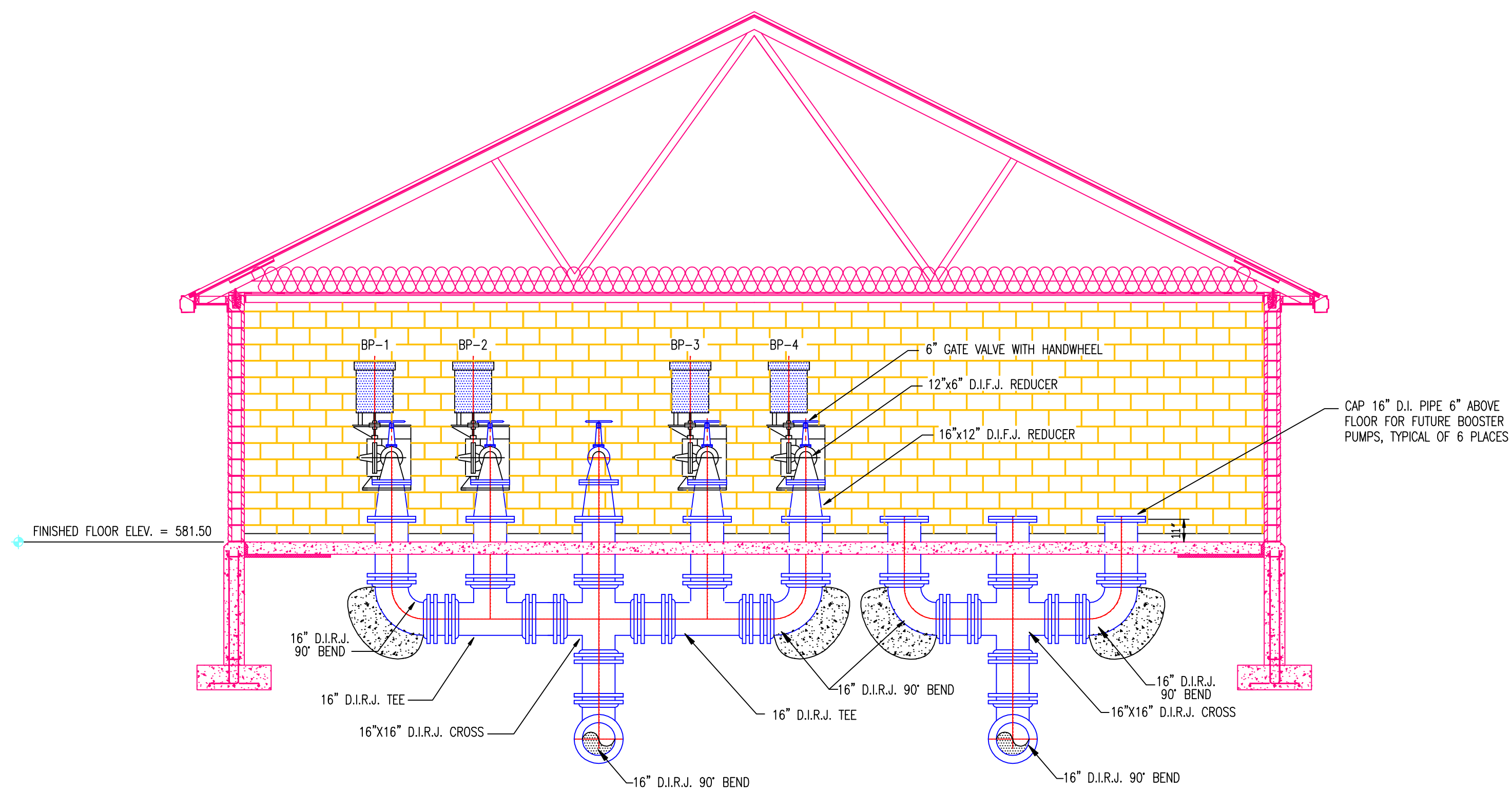


3 BOOSTER STATION DISCHARGE PIPING SECTION
33 SCALE 1/4" = 1'-0"

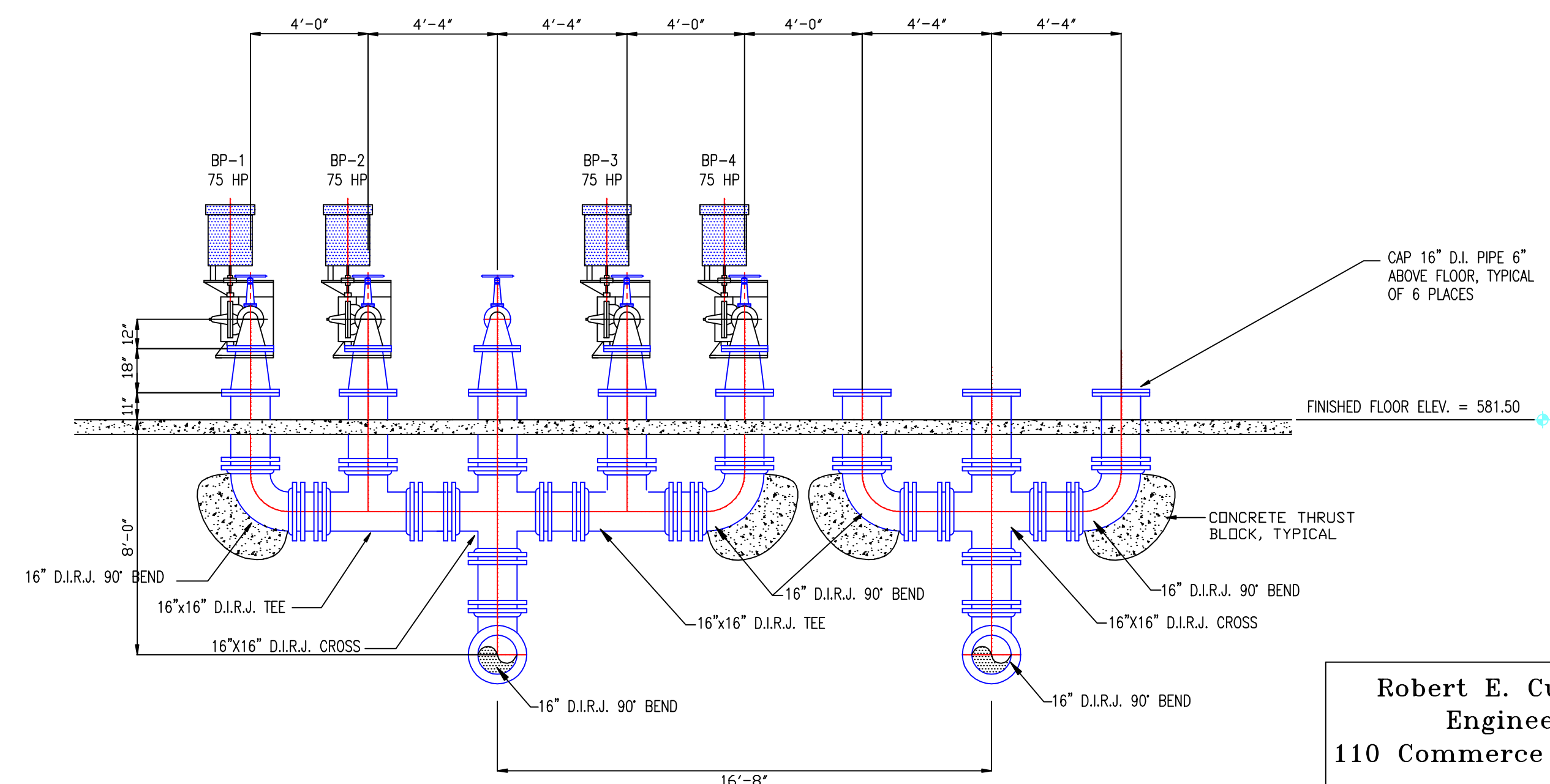


4 BOOSTER STATION DISCHARGE PIPING SECTION
33 SCALE 1/4" = 1'-0"

NOTE:
ALL PIPING ABOVE FLOOR SLAB IN BOOSTER STATION SHALL BE FLANGED ENDS. ALL PIPING & FITTINGS BELOW FLOOR SLAB AT BOOSTER STATION SHALL BE PRESSURE CLASS 350 DUCTILE IRON RESTRAINED MECHANICAL JOINT. ALL FITTINGS SHALL ALSO HAVE CONCRETE THRUST BLOCKS



1 BOOSTER STATION SUCTION PIPING SECTION
33 SCALE 1/4" = 1'-0"



2 BOOSTER STATION SUCTION PIPING SECTION
33 SCALE 1/4" = 1'-0"

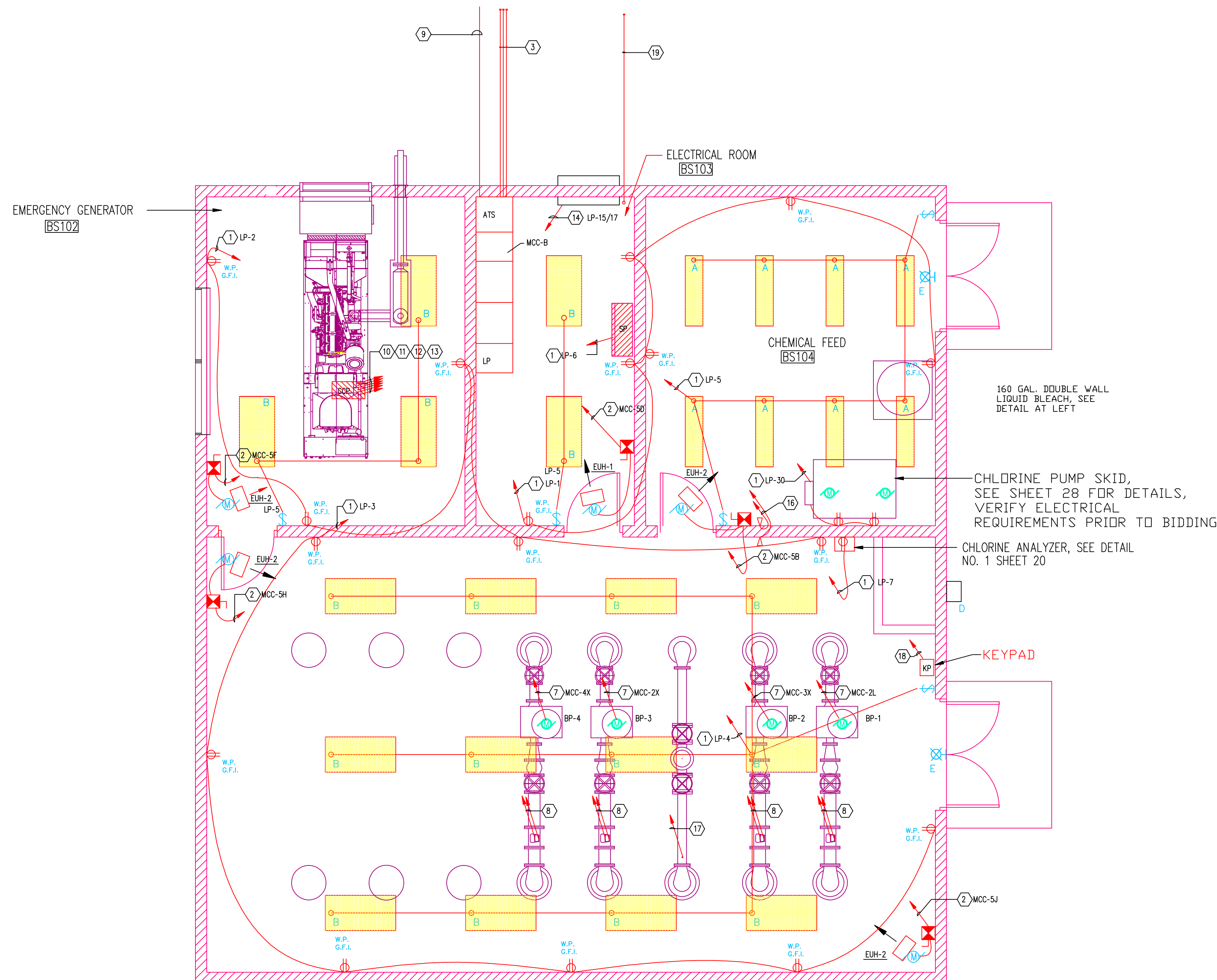
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CHARLESTOWN STATE PARK
WATER SUPPLY IMPROVEMENTS
DIVISION II—WELLS, WTP & BOOSTER STATION

BOOSTER STATION PIPING & PUMP SECTIONS

DATE: APPROVED BY: DRAWING NUMBER: 33 OF 36



- 1 2-#12, 1/2" C., 20A/SP BKR. PANEL LP
- 2 2-#12, 1/2" C., 20A/3P BKR. PANEL MCC. MOUNT UNIT HEATER DISCONNECT 5'-0" ABOVE FLOOR & UNIT HEATER AT 8'-0" ABOVE FLOOR
- 3 STUB 3-1" CONDUITS OUT 10' FROM BUILDING FOR FUTURE & CAP CONDUITS 6" ABOVE FLOOR
- 4 2-#16, 1/2" C., PANEL MCP ENERGIZE CHLORINE ROOM OUTLETS WITH START OF BOOSTER PUMPS 1-4 & DEENERGIZE WITH STOP OF ALL BOOSTER PUMPS 1-4
- 5 STP 4-20 mA SIGNAL, 3/4"C. FROM SCADA PANEL MCP TO CHEMICAL FEED PUMPS. CHEMICAL FEED PUMP SHALL BE FLOW PROPORTIONAL TO SUM OF ALL BOOSTER PUMP WATER METERS.
- 6 3-#1, 2"C., TO MOTOR STARTER IN MCC. PROVIDE 2' OF FLEX CONDUIT AT PUMP 75 HP, 480V., 3 PHASE MOTOR PROVIDE 8-#16, 1" CONDUIT FROM MOTOR STARTER TO PANEL SP FOR START/STOP, RUN & FAIL SIGNALS
- 7 STP, 3/4"C. FROM WATER METER TO SCADA PANEL SP. PROVIDE 2#12, 1/2"C. POWER SUPPLY TO METER
- 8 2 PARALLEL SETS OF 3-600 MCM COPPER W/GROUND, 4" CONDUITS UNDERGROUND SERVICE ENTRANCE CONDUCTORS
- 9 2 PARALLEL SETS OF 3-600 MCM W/GROUND, 4" CONDUITS FROM GENERATOR CONTROL PANEL TO AUTOMATIC TRANSFER SWITCH
- 10 2-#12, 1/2"C., 20A/2P BKR. LP 26/28, GENERATOR 240V., SINGLE PHASE HEATER
- 11 2-#12, 1/2"C., 20A/SP BKR., LP-25 GENERATOR BATTERY CHARGER
- 12 6-#16, 3/4"C. GENERATOR COMMON ALARM & 2#16, 1/2"C. FUEL RUPTURE ALARM EACH TO SCADA PANEL SP
- 13 3-#10, 3/4"C., 30A/2P BKR. PANEL LP PACKAGED TERMINAL AIR CONDITIONING UNIT (HEAT PUMP) EQUAL TO FRIEDRICH MODEL PDH15K5S, 15,050 BTU COOLING, WITH LEXAN GRILLE & WALL CASE. 240 V., 1 PHASE. GRAINGER MODEL 10FA5

GENERAL ELECTRIC NOTES:

1. ALL WORK SHALL BE DONE IN ACCORDANCE WITH ALL LOCAL CODES & ORDINANCES, & IN NO INSTANCES SHALL THE ELECTRICAL WORK BE LESS THAN THE REQUIREMENTS OF THE LATEST PRINTED EDITION OF THE NATIONAL ELECTRIC CODE.
 2. MINIMUM WIRE SIZE SHALL BE #12 COPPER UNLESS SHOWN OTHERWISE
 3. ALL CONDUCTORS SHALL BE IN CONDUIT & BELOW FLOOR, IN BLOCK, OR ABOVE CEILING, EXCEPT WHEN APPROVED BY ENGINEER IN WRITING
 4. GROUND ALL EQUIPMENT, FIXTURE & SYSTEMS AS PER THE REQUIREMENTS OF THE NEC & NFPA.
 5. CONTRACTOR SHALL PROVIDE CIRCUITS, CONDUIT, BREAKERS, AND SIGNAL CIRCUITS FOR ALL EQUIPMENT FURNISHED BY CONTRACTOR AS PART OF CONTRACT
 6. TEST ALL CONDUCTORS. CONDUCTORS SHALL BE MEGGED. ENGINEER SHALL WITNESS ALL TESTING. MEGOHMS READINGS SHALL FALL WITHIN CONDUCTOR SUPPLIER'S RECOMMENDATION CONDUCTORS NOT PASSING SHALL BE REPLACED BY CONTRACTOR AT HIS EXPENSE. PROVIDE OWNER & ENGINEER WRITTEN REPORT WITH TEST RESULTS AND DATE AND TIME OF TEST.
 7. BALANCE ALL PHASE CURRENT FOR MOTORS. ENGINEER OR OWNER SHALL WITNESS ALL TESTING PHASE UNBALANCE SHALL NOT EXCEED 5% AT SERVICE FACTOR LOAD OR 10% AT RATED INPUT LOAD. PROVIDE OWNER & ENGINEER WRITTEN REPORT WITH TEST RESULTS AND DATE AND TIME OF TEST.
 8. CONTRACTOR SHALL CONNECT AUTO DIALER AND PROGRAM DIALER TO CALL TELEPHONE NUMBERS AS DIRECTED BY OWNER
 9. ALL CONDUCTORS SHALL BE COPPER. NO COPPER CLAD CONDUCTORS ALLOWED.
 10. SEE ENTIRE PLAN SET FOR REQUIRED ELECTRICAL REQUIREMENTS
- 15 2-#12, 1/2" C., PANEL TP. ENERGIZE CHLORINE ROOM OUTLET #2 WITH START OF BOOSTER PUMP NO. 4 & DEENERGIZE WITH STOP OF BOOSTER PUMP NO. 4
 - 16 MOTION DETECTOR, 2#16, 1/2"C. TO MCP. PROVIDE POSER SUPPLY
 - 17 PROVIDE PRESSURE TRANSDUCER IN PIPE WITH 2#16, 1/2"C. TO MCP PROVIDE POWER SUPPLY TO PRESSURE TRANSDUCER
 - 18 SECURITY KEYPAD, 2#16, 1/2"C. TO MCP. PROVIDE POSER SUPPLY
 - 19 RUN 1" CONDUIT 10' FROM BUILDING & CAP. STUB OTHER END 6" ABOVE AND CAP FOR SCADA USE.

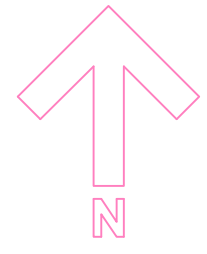
LIGHT FIXTURE SCHEDULE				
FIXTURE NO.	DESCRIPTION	NO. OF LAMPS	MANUFACTURER	MODEL NO.
A	DAMP LOCATION 4' FLUORESCENT	2-40 W	HUBBELL	EDLO42R-SP DR-E1
B	2 x 4' SURFACE FLUORESCENT	4-40 W	HUBBELL	SSD4CA05-E1
C				
D	WALL PACK W/PHOTOCELL	175W	HUBBELL	PERIMAMITE PRM-175H-118
E	EXIT LIGHT	2-15W	HUBBELL	EX20E1-UR1

- NOTES:
1. PROVIDE CIRCUIT & BREAKER AS REQUIRED FOR ALL FIXTURES
 2. SEE HVAC PLAN FOR EXHAUST FAN DUCT AND EXHAUST GRILLE IN SOFFIT
 3. SWITCH FIXTURE "D" NEAR LAB DOOR (CLARIFIER & OXIDATION DITCH FIXTURE, SEE FIXTURE "D" DETAIL NO. 2 ON CLARIFIER DRAWING)
 4. MOUNT FIXTURE "C" 12" ABOVE FINISHED FLOOR ELEVATION

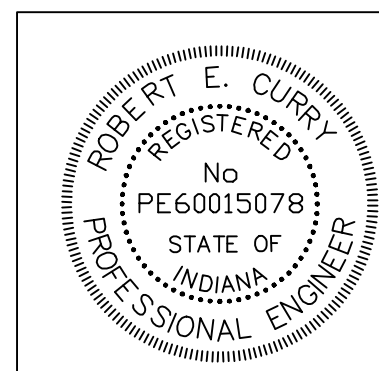
ELECTRIC UNIT HEATER AND BASEBOARD HEATER SCHEDULE					
NO.	DESCRIPTION	KW	VOLT	PHASE	MODEL NO.
EUH-1	ELECTRIC UNIT HEATER	10	480	3	EMERSON MUH-10-04
EUH-2	ELECTRIC UNIT HEATER	15	480	3	EMERSON MUH-15-04

- NOTES:
1. ALL UNIT HEATERS SHALL BE SUPPLIED WITH SELF CONTAINED THERMOSTAT
 2. PROVIDE WALL MOUNTING BRACKET FOR ALL UNIT HEATERS.

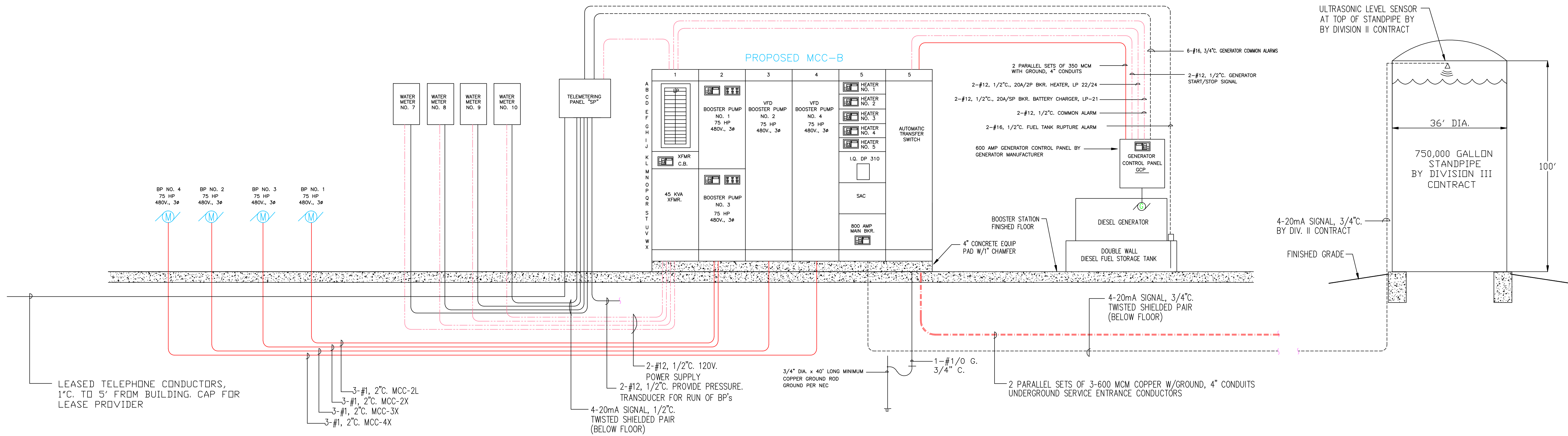
1 BOOSTER STATION ELECTRICAL PLAN
34 SCALE 1/4" = 1'-0"



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INDIANA DEPARTMENT OF NATURAL RESOURCES D.A.P.W. PROJECT NO. E030094		DRAWN BY:
CHARLESTOWN STATE PARK WATER SUPPLY IMPROVEMENTS DIVISION II-WELLS, WTP & BOOSTER STATION		REVISION:
BOOSTER STATION ELECTRICAL PLAN		
DATE:	APPROVED BY:	DRAWING NUMBER: 34 OF 35



1 BOOSTER STATION ELECTRICAL SCHEMATIC
35 NO SCALE

MOTOR CONTROL CENTER DATA													
UNIT NO.	CLASS OR DESCRIPTION	STARTER SIZE	H.P.	FLA	CONTROL DEVICE CODE	BREAKER FRAME	POLE	TRIP AMPS	SEE MCC NOTES	CONTACTS NO	CPT VA	NAMEPLATE INFORMATION	GEN. STEP LOADING
1L	C.B.					HFD	2	200				LIGHTING PANEL 42 SPACES	1
1X	C.B.					HFD	3	200				45 KVA TRANSFORMER BREAKER	1
1X	XFMR											45 KVA 3 PHASE TP SINGLE PHASE 45 KVA TRANSFORMER	1
2L	IT SOFT STARTER	4	75	150	H-O-A/P.L.	HMCP	3	150	2,3,4,5,6	2	2	BOOSTER PUMP NO. 1	1
2X	IT SOFT STARTER	4	75	150	H-O-A/P.L.	HMCP	3	150	2,3,4,5,6	2	2	BOOSTER PUMP NO. 3	2
3X	SVX9000 VFD	3	75	96	H-O-A/P.L.	HMCP	3	150	2,3,4,5,6	2	2	BOOSTER PUMP NO. 2	2
4X	SVX9000 VFD	3	75	96	H-O-A/P.L.	HMCP	3	150	2,3,4,5,6	2	2	BOOSTER PUMP NO. 4	2
5B	C.B.					HFD	3	20				15 KW ELECTRIC UNIT HEATER NO. 1 CHEMICAL ROOM	1
5D	C.B.					HFD	3	20				15 KW ELECTRIC UNIT HEATER NO. 2 ELECTRICAL ROOM	1
5F	C.B.					HFD	3	20				15 KW ELECTRIC UNIT HEATER NO. 3 GENERATOR ROOM	1
5H	C.B.					HFD	3	20				15 KW ELECTRIC UNIT HEATER NO. 4 PUMP ROOM	1
5J	C.B.					HFD	3	20				15 KW ELECTRIC UNIT HEATER NO. 5 PUMP ROOM	1
5N	I.Q. METER I.Q.D.P. 310						3					I.Q. DATA PLUS 310 METERING	
5T	SAC						3					SURGE ARRESTOR CAPACITOR	
5X	CKT. BREAKER					HLD	3	800				800 AMP MAIN CIRCUIT BREAKER	
6	SERV. ENT. ATS					HLD	3	800				SERVICE ENTRANCE RATE AUTOMATIC TRANSFER SWITCH	

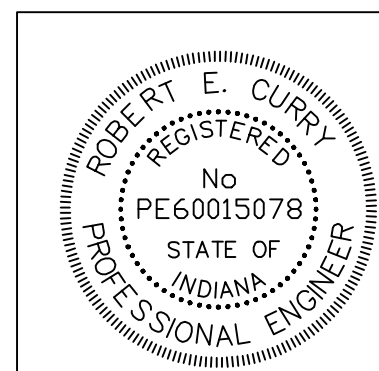
MCC NOTES:

1. PROVIDE CAPACITORS FOR 90% POWER FACTOR.
2. PROVIDE O.L. RELAY ALARM CONTACT
3. PROVIDE H-O-A COVER CONTROL/ PILOT LIGHT (RUN) FOR ALL STARTERS
4. PROVIDE AUX. CONTACTS 1-N.O./1-N.C. ON OPERATOR OUTSIDE CONTROL SOURCE (PLC) FOR ALL STARTERS
5. PROVIDE ELAPSED TIME METERS MOUNTED ON ALL STARTERS
6. CONTRACTOR SHALL PROVIDE STEP RELAYS FOR GENERATOR STEP LOADING

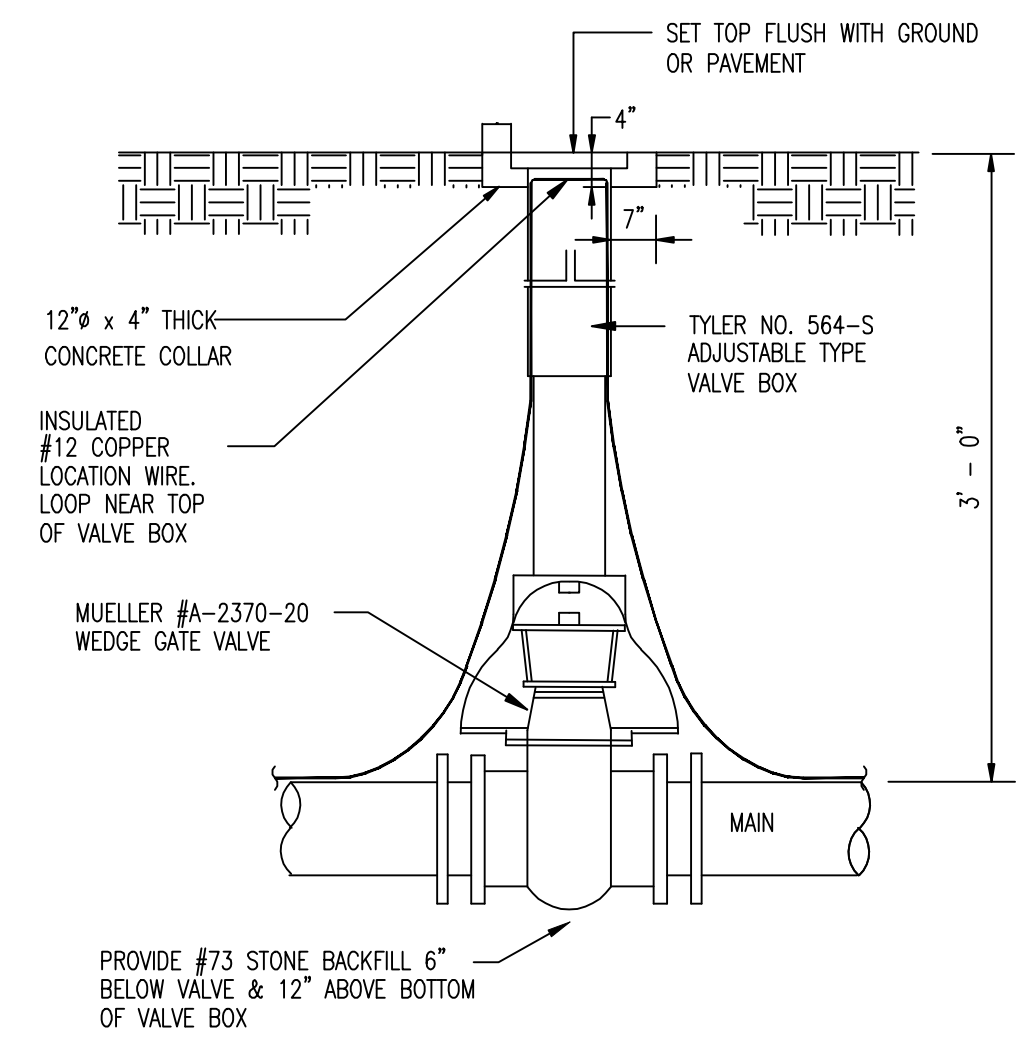
PANEL "LP" SCHEDULE								
Panelboard Designation: LP		Location: ELECTRICAL ROOM 102		Voltage: 120/240, 1-PH, 3W				
Ampere COPPER Bus: 200A		Mounting: SURFACE		Fed from: MCC				
Ampere Main Breaker: 2MB								
LOAD DESIGNATION	CKT BKR	CKT NO.	CONNECTED LOAD (kW) PHASE A	PHASE B	CKT NO.	CKT BKR.	LOAD DESIGNATION	
OUTLETS ROOMS BS103, BS104	20	1	864	720	2	20	OUTLETS BS101, BS102	
OUTLETS ROOM BS101	20	3		864	1920	4	LIGHTS BS101	
LIGHTS BS102, BS103, BS104	20	5	1440	500	6	20	CHLORINE ANALYZER	
PTAC	30/2P	7		720	1920	8	GENERATOR HEATER	
GENERATOR BATTERY CHARGER	20	11	1120	1920	10	20	LIGHTS ROOMS 104, 107	
SPARE	20	13	1920	1920	12	20	LIGHTS ROOM 106	
PTAC	30/2P	15		3336	1920	16	20/2P GENERATOR HEATER	
SPARE	20	17	3336	1920	18			
SPARE	20	19		1920	1920	20	20	SPARE
SPARE	20	21	1920	1920	22	20	20	SPARE
		23						24
		25						26
		27						28
		29						30
		31						32
		33						34
		35						36
		37						38
		39						40
		41						42
TOTAL CONNECTED LOAD (Watts):			17,580	17,160				

NOTE: PROVIDE POWER, BREAKER, CONDUCTORS, AND CONDUIT TO ALL EQUIPMENT, OUTLETS & FIXTURES. SOME CIRCUITS MAY NOT BE SHOWN

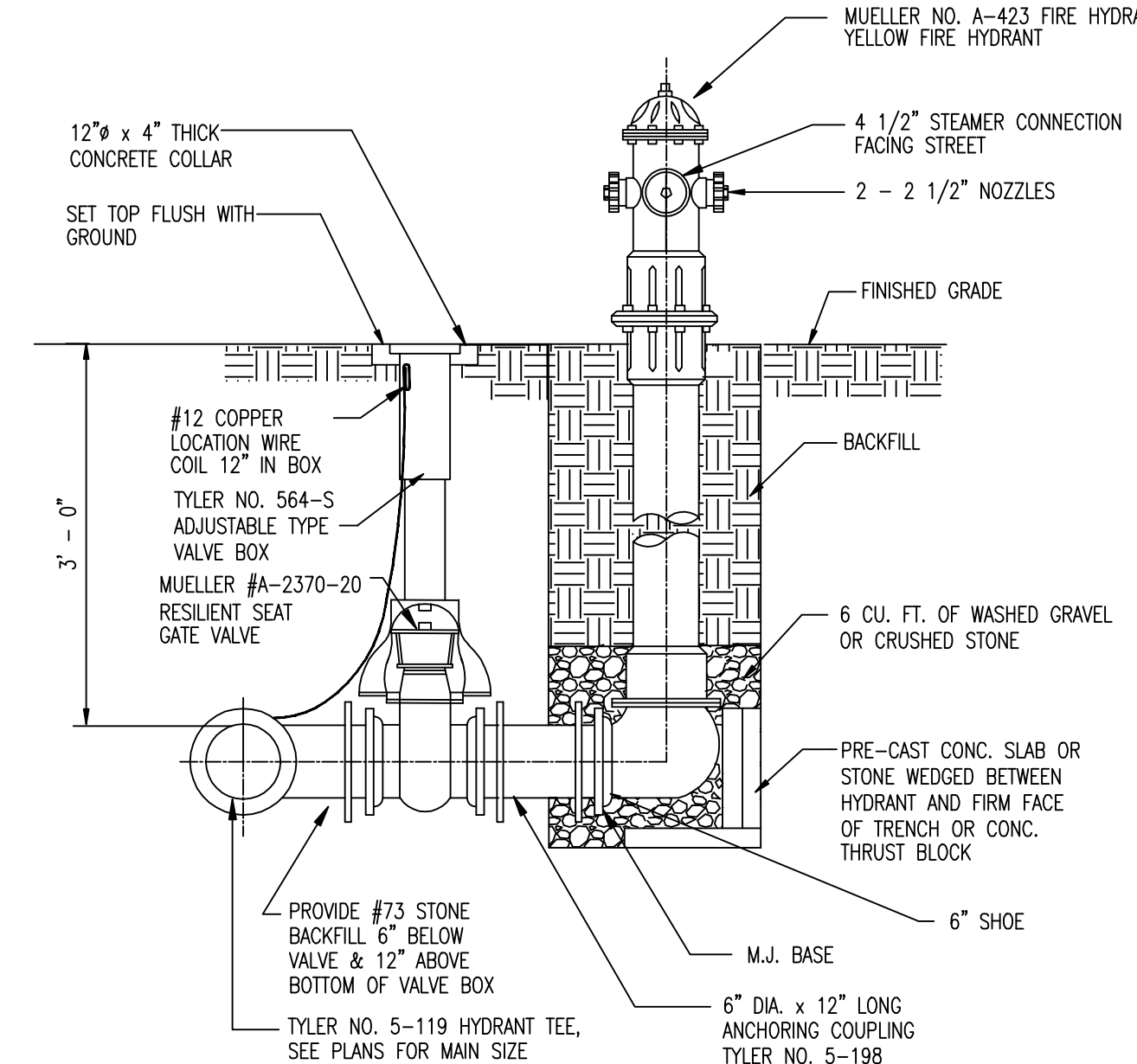
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INDIANA DEPARTMENT OF NATURAL RESOURCES D.A.P.W. PROJECT NO. EO30094	
CHARLESTOWN STATE PARK WATER SUPPLY IMPROVEMENTS DIVISION II-WELLS, WTP & BOOSTER STATION	DRAWN BY: REVISION:
BOOSTER STATION ELECTRICAL SCHEMATIC	
DATE:	APPROVED BY: DRAWING NUMBER: 35 OF 36

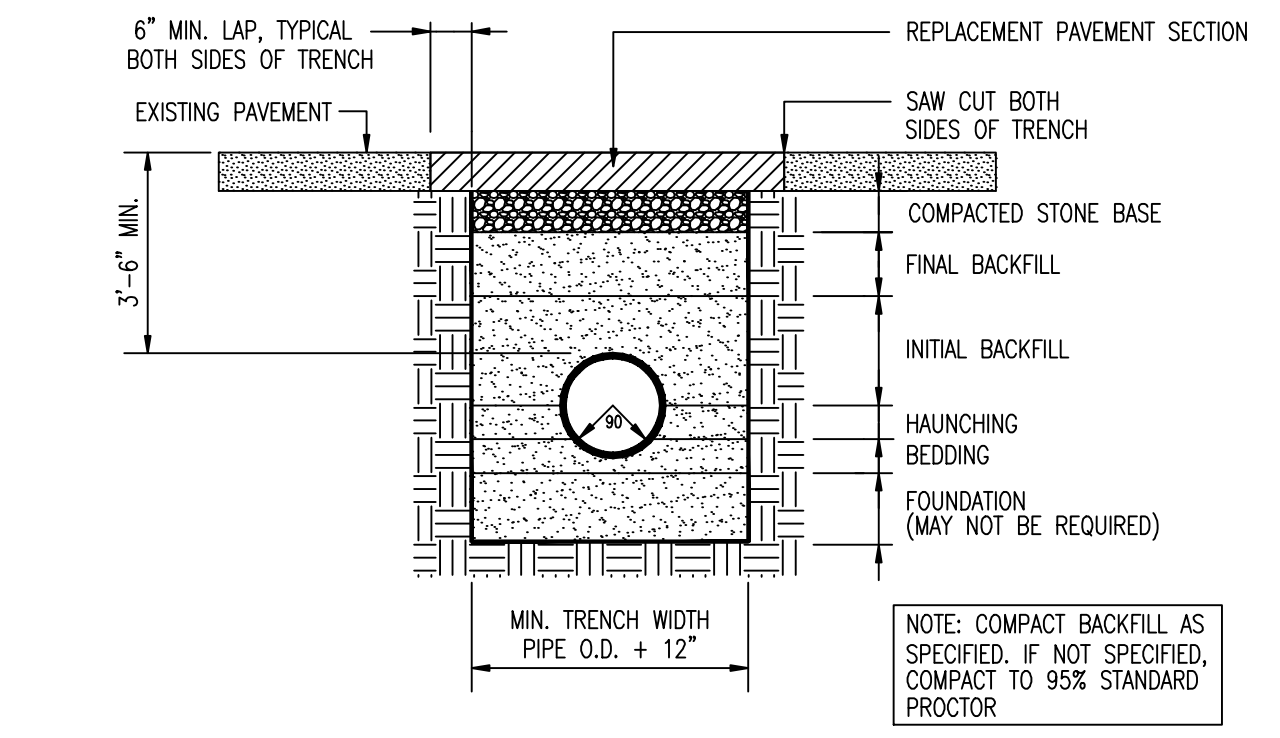


TYPICAL GATE VALVE & VALVE BOX
NO SCALE

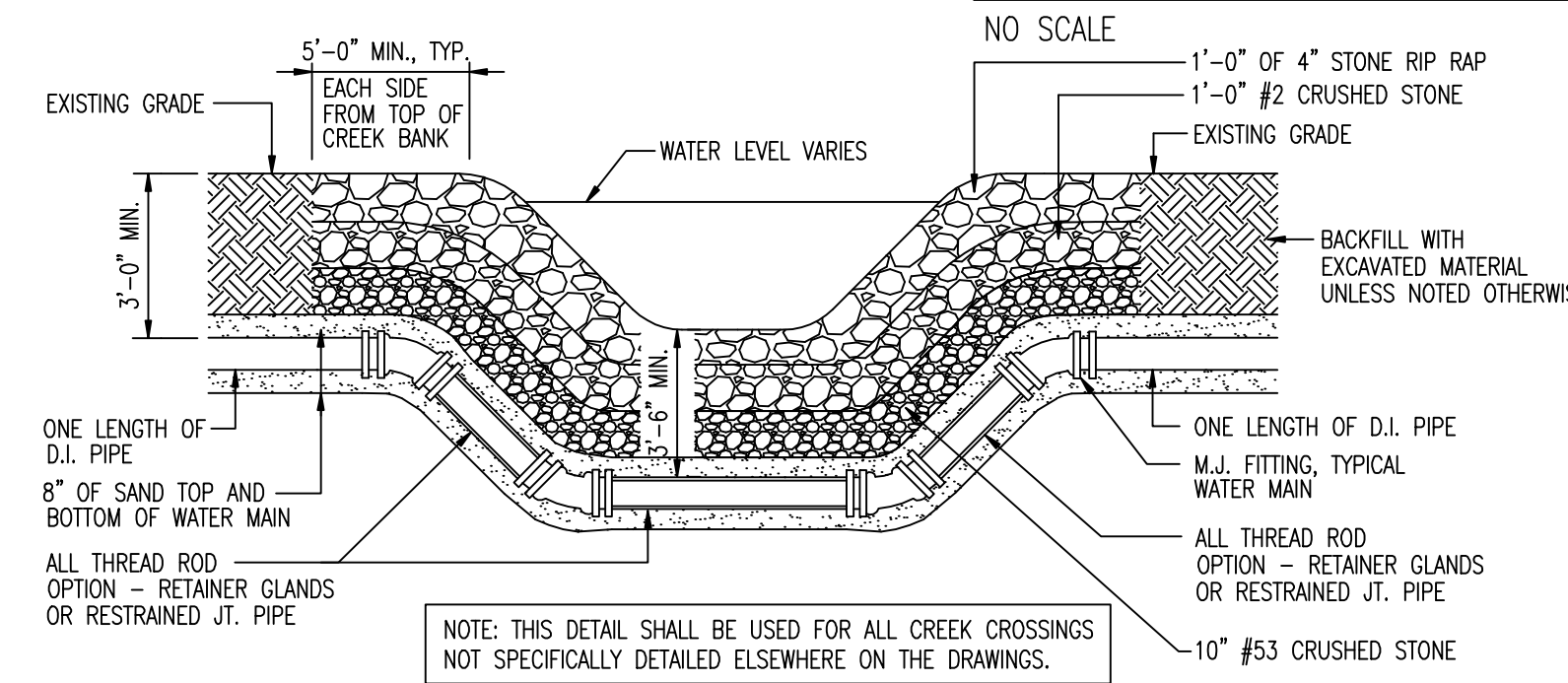


STANDARD FIRE HYDRANT
NO SCALE

- REPLACEMENT PAVEMENT REQUIREMENTS:
1. ASPHALT PAVEMENT: MIN. 6" #53 CRUSHED STONE BASE, MIN. 3" H.A.C. BINDER, MIN. 1" H.A.C. SURFACE COURSE.
 2. CONCRETE PAVEMENT: BASE & WEARING SURFACE TO BE SAME OR BETTER THAN EXISTING MATERIAL.
 3. CHIP SEAL PAVEMENT: MIN. 6" #53 CRUSHED STONE BASE; APPLY PRIME COAT OVER BASE AT RATE SPECIFIED; APPLY FIRST BITUMINOUS SEAL COAT AT RATE SPECIFIED; APPLY COVERING AGGREGATE OF CRUSHED STONE OR GRAVEL AT RATE SPECIFIED; APPLY SECOND BITUMINOUS SEAL COAT AT RATE SPECIFIED; APPLY FINAL COVERING AGGREGATE OF CRUSHED STONE OR GRAVEL AT RATE SPECIFIED.
 4. LOOSE PAVEMENT: MIN. 6" OF #53 CRUSHED STONE AGGREGATE.



CROSSING DETAIL FOR HARD SURFACE PAVEMENTS
NO SCALE NOTE: SEE BELOW DETAIL FOR STATE HIGHWAY CROSSING DETAIL



CREEK CROSSING DETAIL
NO SCALE

TABLE OF STEEL CASING SIZES

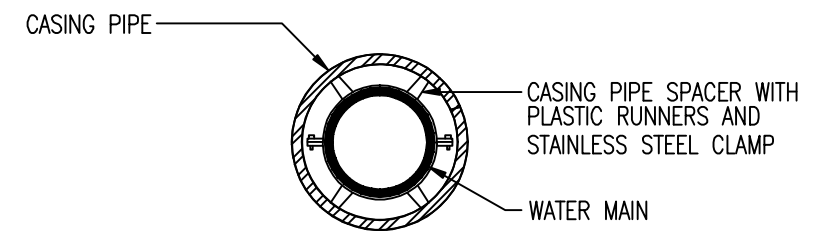
CARRIER PIPE SIZE (DIA. IN INCHES)	CASING SIZE (INSIDE DIA. IN INCHES)	MAXIMUM SPACER SUPPORT SPACING FEET	WITH PROTECTIVE COATING WALL THICKNESS IN INCHES	WITHOUT PROTECTIVE COATING WALL THICKNESS IN INCHES
6"	14"	6' (3/PIPE)	0.188"	0.251"
8"	16"	6' (3/PIPE)	0.219"	0.282"
10"	18"	6' (3/PIPE)	0.250"	0.313"
12"	20"	6' (3/PIPE)	0.281"	0.344"
16"	26"	6' (3/PIPE)	0.375"	0.438"
20"	30"	6' (3/PIPE)	0.406"	0.469"
24"	34"	6' (3/PIPE)	0.469"	0.532"

NOTE: THE ABOVE GIVEN CASING SIZES DO NOT REFLECT THE SIZE REQUIRED WHEN DUCTILE IRON RESTRAINED JOINT PIPE IS SPECIFIED THROUGH CASING. REFER TO PLANS FOR REQUIRED CASING SIZE WHEN SUCH PIPE IS SPECIFIED.

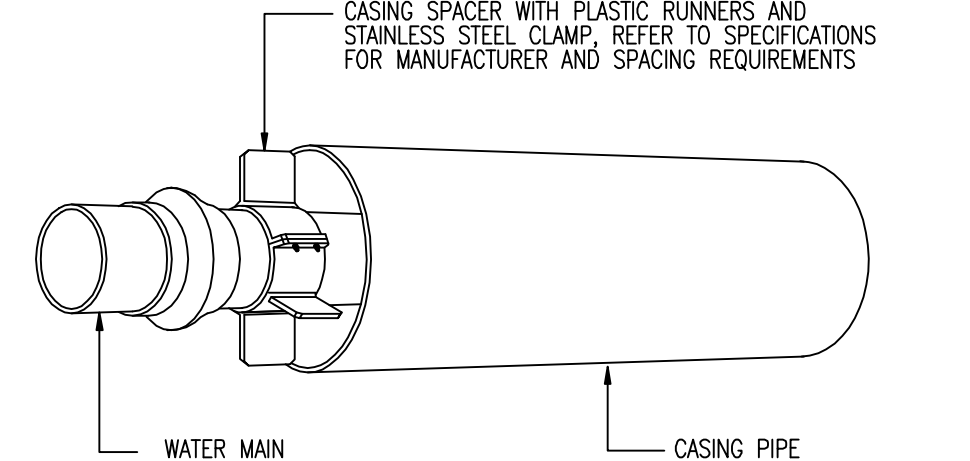
MAXIMUM ALLOWABLE LEAKAGE FOR PIPE WITH ELASTOMER JOINTS PER 1,000 FT. U.S. GALLONS PER HOUR

PIPE SIZE	50 PSI TEST	100 PSI TEST	150 PSI TEST	200 PSI TEST	250 PSI TEST
4"	0.19	0.27 (0.30)	0.33 (0.37)	0.38 (0.43)	0.43 (0.47)
6"	0.29	0.41 (0.45)	0.50 (0.55)	0.57 (0.64)	0.64 (0.71)
8"	0.38	0.54 (0.60)	0.66 (0.74)	0.76 (0.85)	0.85 (0.95)
10"	0.48	0.68 (0.75)	0.83 (0.92)	0.96 (1.06)	1.07 (1.19)
12"	0.57	0.81 (0.90)	0.99 (1.10)	1.15 (1.28)	1.28 (1.42)

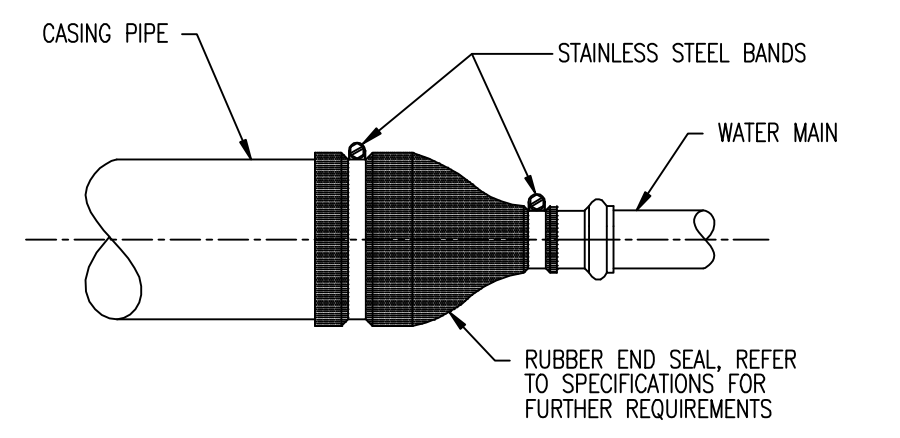
* D.I. Pipe shown in parentheses. PVC shown without parentheses.



CENTERING CARRIER PIPE WITH CASING SPACER



CASING SPACER DETAIL
NO SCALE



CASING END SEAL DETAIL
NO SCALE

THRUST BLOCK SCHEDULE

PIPE SIZE	ELBOWS			TEE	VALVES & HYDRANT		REDUCER	
	90°	45°	22 1/2°		11 1/4°			
16"	37.8	19.1	11.2	3.0	28.6	21.4	16 X 14	3.6
14"	29.8	14.9	8.9	2.3	23.2	16.4	14 X 12	3.1
12"	21.1	8.6	6.6	1.7	16.6	10.5	12 X 10	2.6
10"	11.5	5.9	3.6	1.2	9.4	7.8	10 X 8	2.1
8"	7.2	3.7	2.1	1.2	5.4	4.6	8 X 6	1.6
6"	3.2	3.0	1.3	1.2	3.5	2.6	6 X 4	1.6
4" & UNDER	1.3	3.0	1.3	1.2	3.5	1.3	4 X 3	1.6

NOTE: CLASS 150 PIPE, TEST PRESSURE P.S.I.; SOIL BEARING: 2000 P.S.I. THRUST BLOCK CONTACT AREA OF UNDISTURBED EARTH BANK IN SQUARE FEET. CONCRETE THRUST BLOCKS TO BE 2500 P.S.I. CONCRETE, POURED IN PLACE WITH SLUMP BETWEEN 1" MINIMUM AND 4" MINIMUM.

TABLE OF PVC CASING SIZES

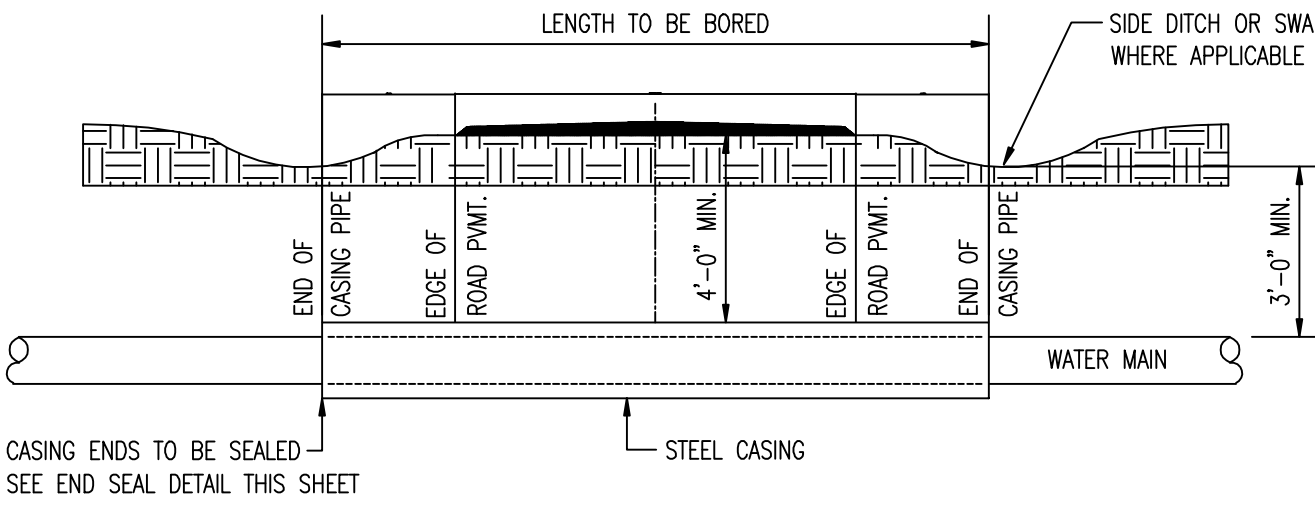
SDR 21 CARRIER PIPE SIZE (DIA. IN INCHES)	SDR 35 CASING SIZE (INSIDE DIA. IN INCHES)	MAXIMUM SPACER SUPPORT SPACING FEET
2"	4"	6' (3/PIPE)
4"	6"	6' (3/PIPE)
6"	10"	6' (3/PIPE)
8"	12"	6' (3/PIPE)
10"	16"	6' (3/PIPE)
12"	18"	6' (3/PIPE)

NOTE: USE PVC CASING ONLY WHEN SPECIFIED.

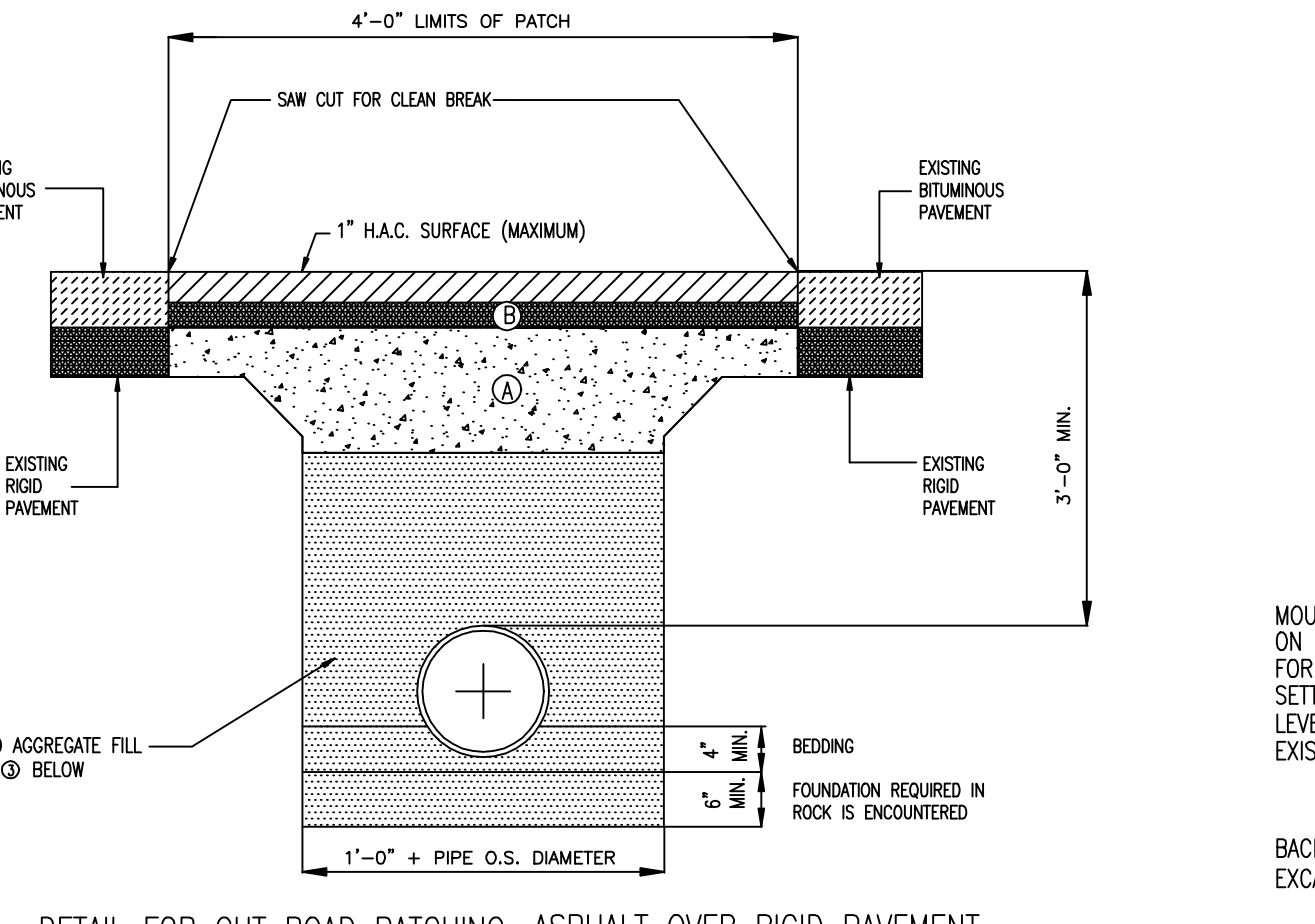
CHLORINE REQUIRED FOR MAIN DISINFECTION PER 1,000 FT. @ 50 PPM

MAIN SIZE	REQUIRED CHLORINE	
	SOLUTION - SODIUM HYPOCHLORITE - 15%	POWDER - CALCIUM HYPOCHLORITE - 85% (HTH)
2"	0.07 GAL.	0.13 lb.
4"	0.25 GAL.	0.48 lb.
6"	0.56 GAL.	1.07 lb.
8"	1.0 GAL.	1.90 lb.
10"	1.51 GAL.	2.90 lb.
12"	2.16 GAL.	4.14 lb.

NOTE: WATER MAIN TO BE DISINFECTED FOR A MINIMUM OF 24 HOURS AT 50 PPM. A 10 PPM RESIDUAL IS REQUIRED AT THE END OF THE 24 HOUR STERILIZATION PERIOD. ALL STERILIZATION SHALL CONFORM TO ANWA 651-86

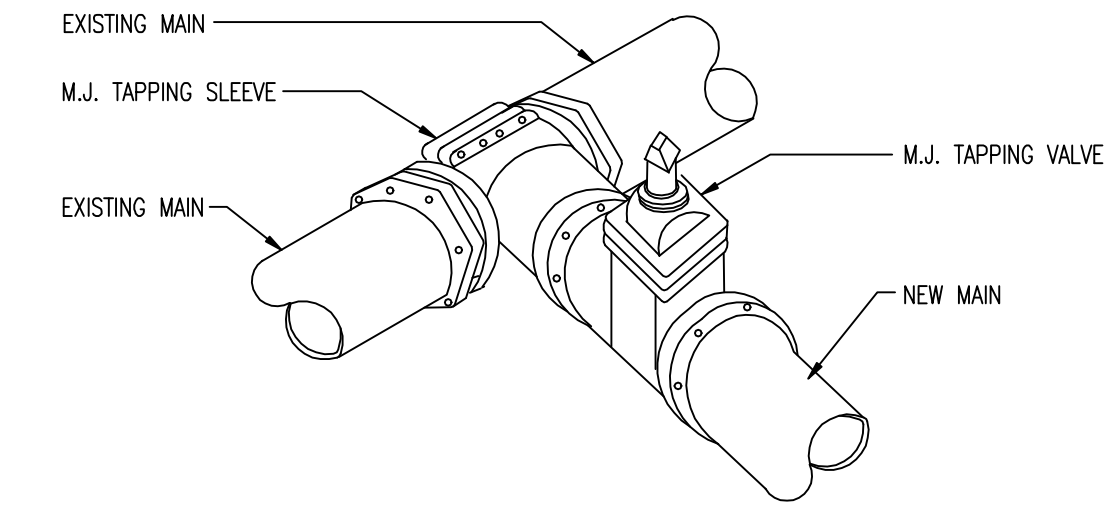


ROAD BORING DETAIL
NO SCALE

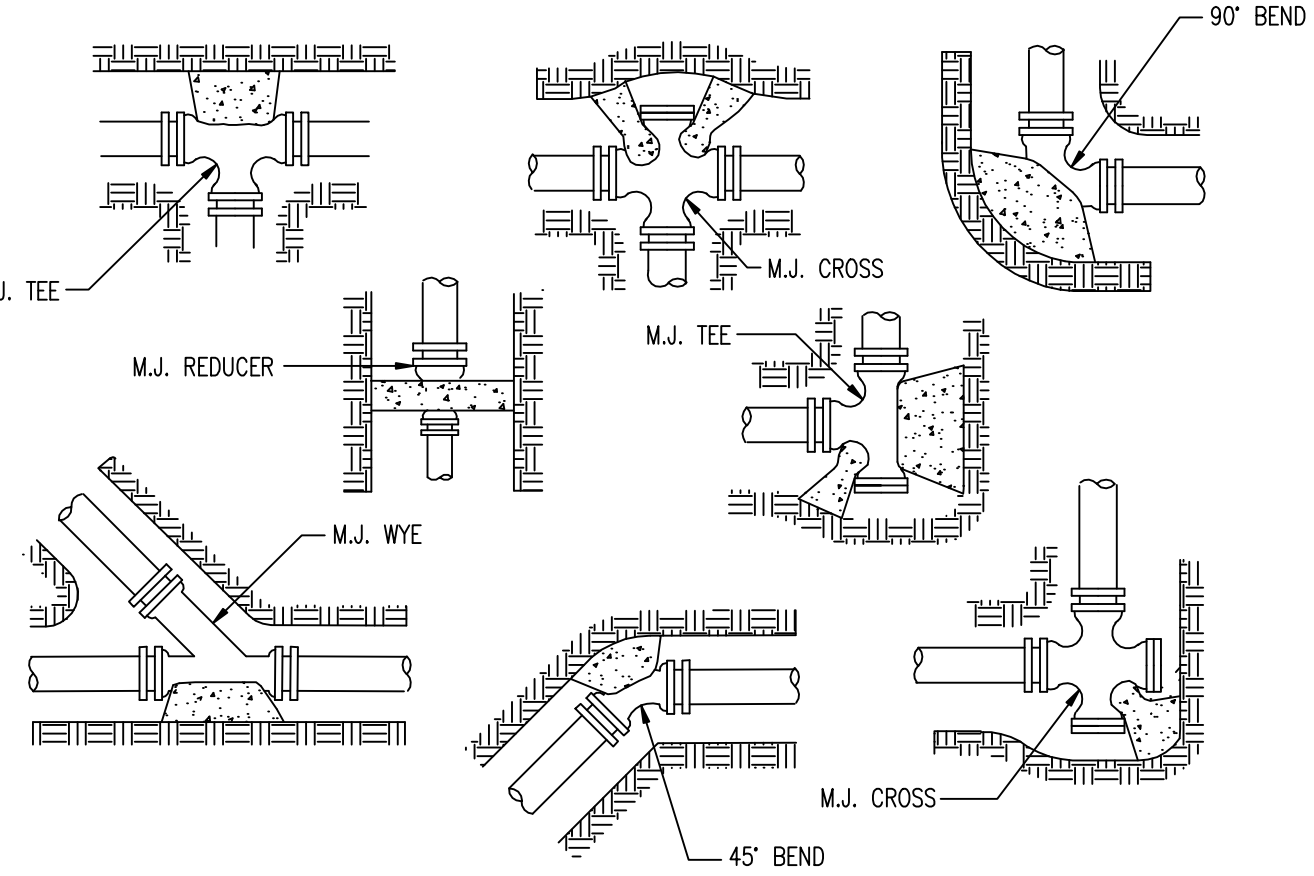


DETAIL FOR CUT ROAD PATCHING ASPHALT OVER RIGID PAVEMENT

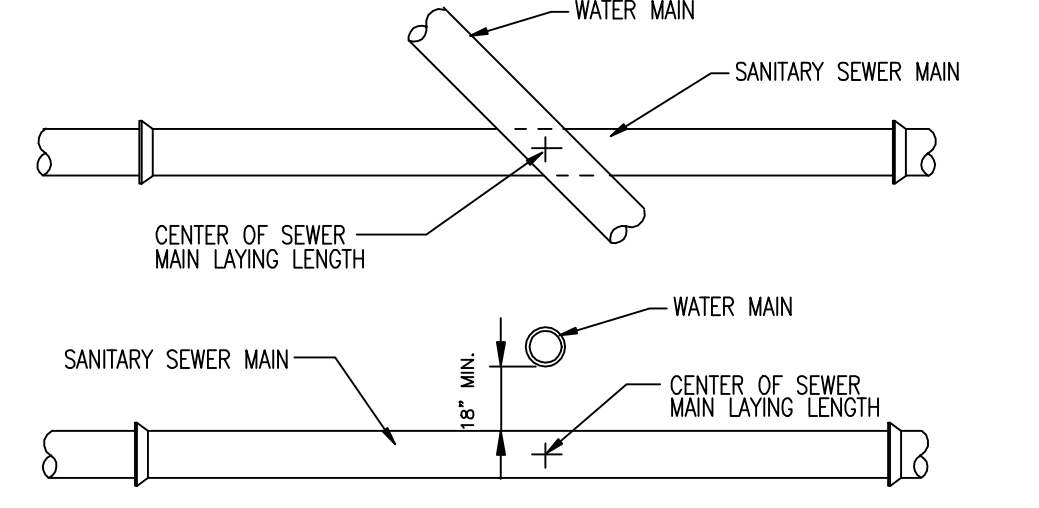
- NOTES:
1. NEW SURFACE IS TO BE SLOPED AT THE SAME RATE AS THE EXISTING SLOPE.
 2. EXISTING PAVEMENT IS TO BE SAW CUT FOR A CLEAN BREAK.
 3. COMPACTED AGGREGATE IS TO BE LAID AT 4" LIFTS AND IS TO BE COMPACTED TO A MIN. OF 90%.
 4. TRENCH SPILL IS TO BE REMOVED FROM THE WORK SITE.
 5. 1" H.A.C. SURFACE (MINIMUM).
 6. BITUMINOUS TACK APPLIED AS PER INDIANA DEPT. OF HIGHWAYS STANDARD SPECIFICATIONS - 1985 SECTION 409 & 902.
- LEGEND:
1. PLAN CONCRETE IS TO BE FINISHED FLUSH TO THE EXISTING RIGID PAVEMENT.
 2. HOT ASPHALTIC MATERIAL IS TO BE FINISHED FLUSH TO THE EXISTING BITUMINOUS MATERIAL AND IS TO BE COMPACTED AS REQUIRED IN THE "CUT ROAD SPECIAL PROVISIONS".



WET TAP TO EXISTING MAIN
NO SCALE

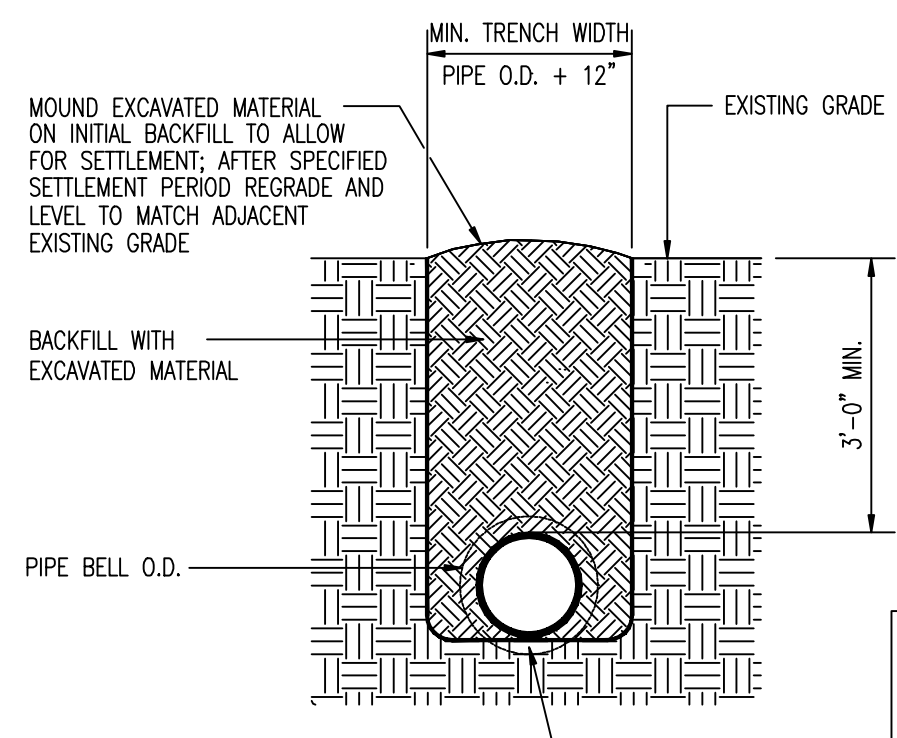


THRUST BLOCK DETAILS
NO SCALE



MINIMUM CROSSING & SEPARATION REQUIREMENTS FOR WATER & SANITARY SEWER MAINS
NO SCALE

CROSSING DETAIL FOR STATE HIGHWAY
NO SCALE



TYPICAL TRENCH DETAIL
NO SCALE

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INDIANA DEPARTMENT OF NATURAL RESOURCES
D.A.P.W. PROJECT NO. EO30094

CHARLESTOWN STATE PARK
WATER SUPPLY IMPROVEMENTS
DIVISION II-WELLS, WTP & BOOSTER STATION

STANDARD DETAILS

DATE: _____ APPROVED BY: _____ DRAWING NUMBER: _____

