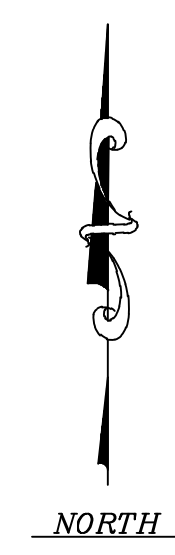


# MADISON WATER UTILITY

## MADISON, WISCONSIN

### UNIT WELL 20

### PUMP AND MCC UPGRADES



**PROJECT LOCATION**  
2829 PRAIRIE ROAD

VICINITY MAP



PROJECT ENGINEER

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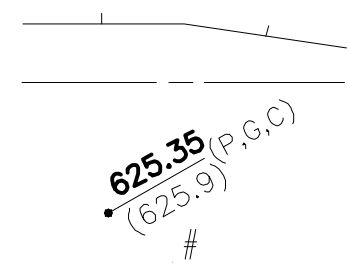
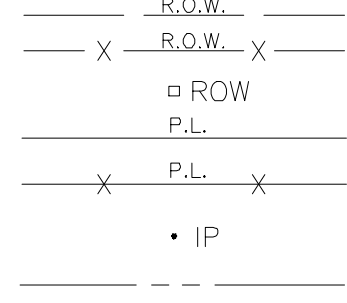
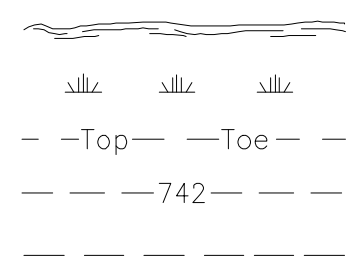
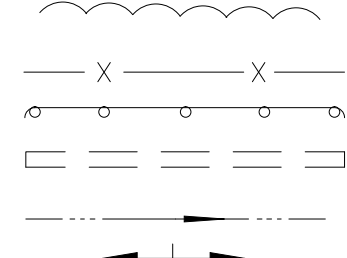
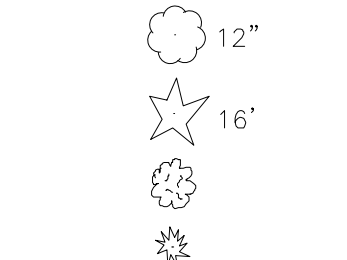
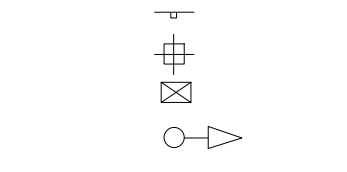
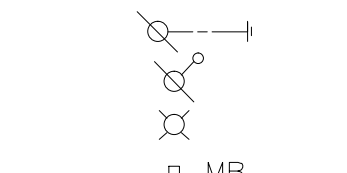
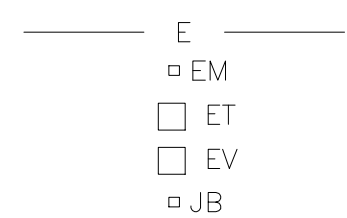
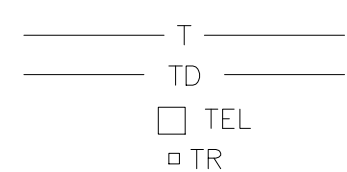
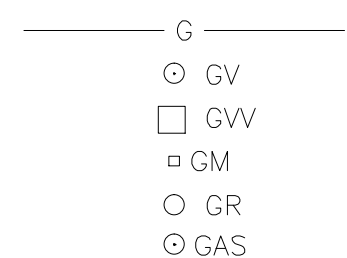
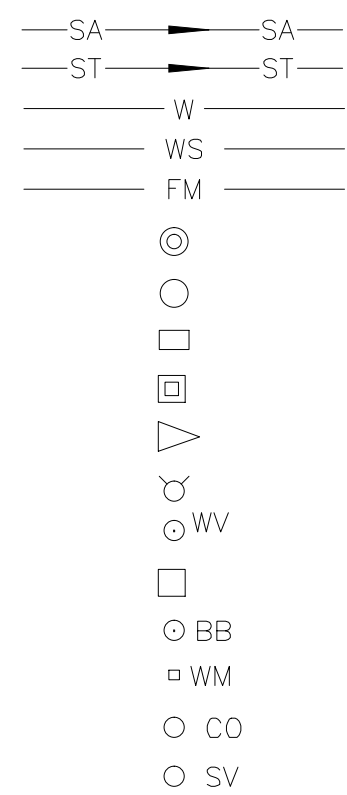
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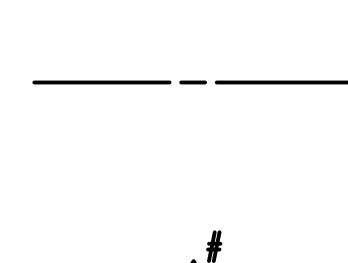
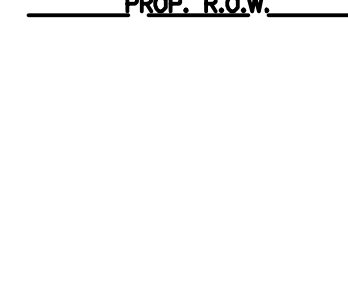
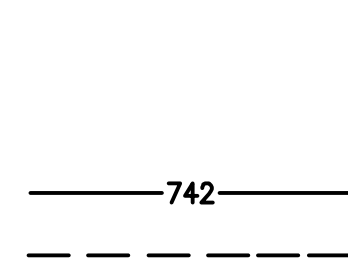
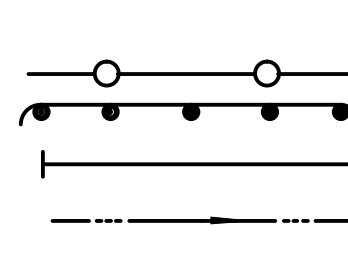
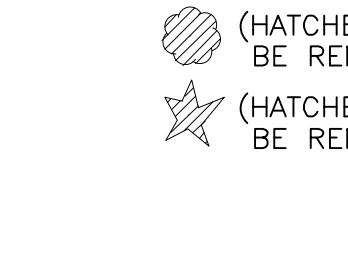
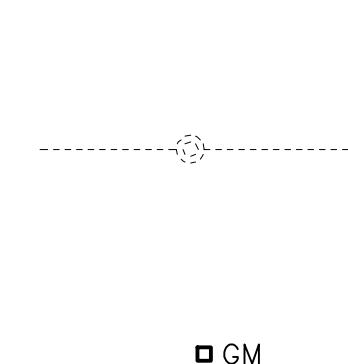
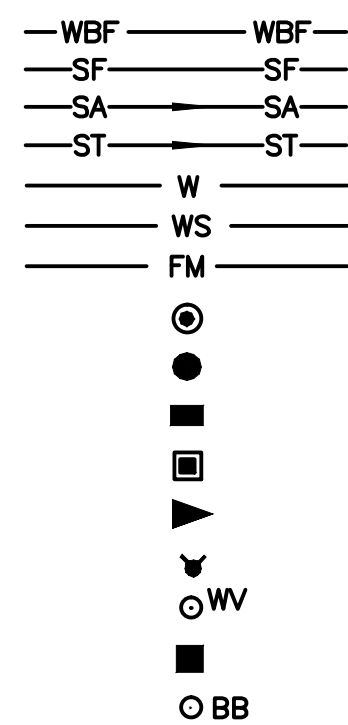
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EXISTING



LEGEND

PROPOSED



ABBREVIATIONS

CL	CENTERLINE	R	STRUCTURE TO BE RECONSTRUCTED
CONC	PORTLAND CEMENT CONCRETE	A	STRUCTURE TO BE ADJUSTED
BIT	BITUMINOUS PAVEMENT	▲	CENTRAL ANGLE
GR	GRAVEL	D=	DEGREE OF CURVE
CMP	CORRUGATED METAL PIPE	T=	TANGENT LENGTH
FH	FIRE HYDRANT	L=	CURVE LENGTH
CI	CAST IRON	R=	RADIUS OF CURVE
DI	DUCTILE IRON	E=	EXTERNAL DISTANCE
F-F	FACE-TO-FACE	SE=	SUPERELEVATION (FT. PER FT. OF WIDTH)
E-E	EDGE-TO-EDGE	X=	EXTERNAL DISTANCE OF VERTICAL CURVE
B-B	BACK-TO-BACK	PC	POINT OF CURVATURE
BM	BENCH MARK	PI	POINT OF INTERSECTION
INV EL	INVERT ELEVATION	PT	POINT OF TANGENCY
CL EL	CENTERLINE ELEVATION	POT	POINT ON TANGENCY
P	POINT	PCC	POINT OF COMPOUND CURVATURE
G	GUTTER	PRC	POINT OF REVERSE CURVATURE
C	CURB	VC	VERTICAL CURVE
BC	BACK OF CURB	N&W	NAIL AND WASHER
EOP	EDGE OF PAVEMENT	TCE	TEMPORARY CONSTRUCTION EASEMENT
PL	PROPERTY LINE		
ROW	RIGHT OF WAY		
FL	FLOW LINE		
TF	TOP OF FRAME		
TC	TOP OF CURB OR CONCRETE		

BENCHMARKS

BM = WELL HOUSE FINISH FLOOR ELEVATION = 1113.39

INDEX

TITLE	SHEET NO.			
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ELECTRICAL PLAN AND DETAILS				E-1

GENERAL NOTES:

- ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS AND DEPARTMENT OF NATURAL RESOURCES REQUIREMENTS.
- EROSION CONTROL DEVICES SHALL BE INSTALLED PRIOR TO THE COMMENCEMENT OF ANY WORK, IN ACCORDANCE WITH THE EROSION CONTROL NOTES LISTED BELOW.
- CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING THE OWNER OF ALL EXISTING FACILITIES SO THE UTILITIES AND THEIR APPURTENANCES MAY BE LOCATED AND ADJUSTED, IF NEEDED, PRIOR TO THE START OF CONSTRUCTION. THE CONTRACTOR SHALL COOPERATE WITH ALL UTILITY OWNERS AS PROVIDED FOR IN THE SPECIFICATIONS.
- CONTRACTOR SHALL PROTECT FROM DAMAGE ALL CONCRETE AND ASPHALT AREAS.
- ONLY CITY OF MADISON PERSONNEL ARE ALLOWED TO OPERATE VALVES AND FIRE HYDRANTS. HYDRANTS SHALL NOT BE UTILIZED FOR MISCELLANEOUS WATER USE.
- CONTRACTOR SHALL CONTACT THE CITY OF MADISON WATER UTILITY 48 HOURS PRIOR TO COMMENCEMENT OF ANY WORK ON THE SITE.

EROSION CONTROL NOTES:

- ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE STATE OF WISCONSIN DEPARTMENT OF NATURAL RESOURCES REQUIREMENTS AND CITY OF MADISON.
- EROSION CONTROL DEVICES SHALL BE INSTALLED PRIOR TO THE COMMENCEMENT OF ANY WORK, MAINTAINED THROUGHOUT THE WORK, AND REMOVED AS DIRECTED BY THE ENGINEER.
- SILT FENCE SHALL BE MAINTAINED AT LEAST ON A WEEKLY BASIS AND AFTER RAIN EVENTS OF 1/2-INCH OR GREATER.
- EROSION BLANKETS SHALL BE PLACED ON RESTORED SLOPES OF 3:1 OR GREATER AND ALONG THE BOTTOM OF ALL DITCHES TO A WIDTH OF 4 FEET. THE COST SHALL BE INCIDENTAL TO THE CONTRACT. LOCATIONS OF THE EROSION BLANKETS WILL BE DETERMINED DURING CONSTRUCTION.
- REFER TO THE SPECIFICATIONS AND STANDARD DETAILS FOR MATERIALS AND INSTALLATION METHODS.



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PLAN SHEET DESIGNATION

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  - E - ELECTRICAL
  - T - TELECOMMUNICATIONS
  - OP - OPERATIONS

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 MADISON, WISCONSIN

UNIT WELL 20  
 PUMP AND MCC UPGRADES

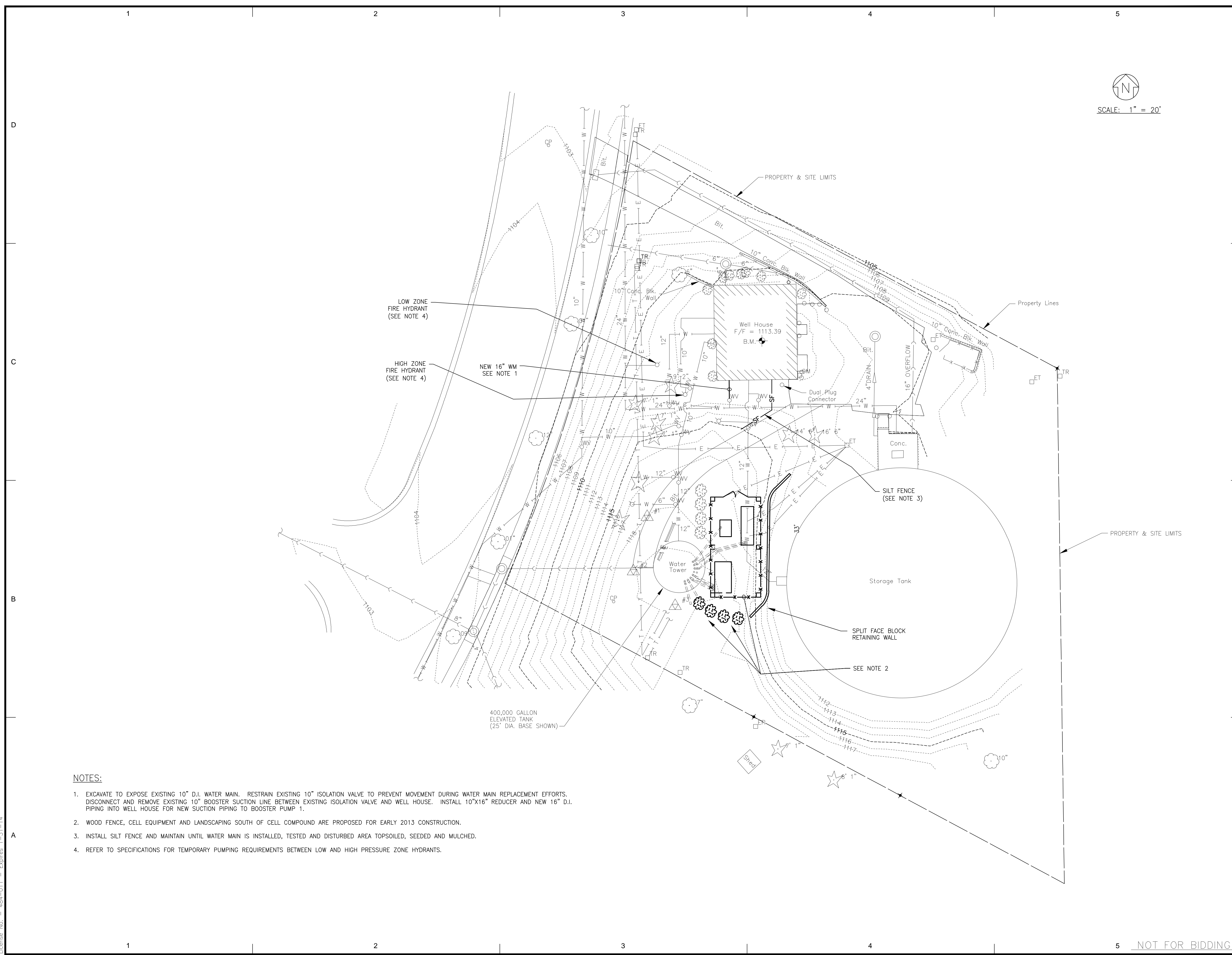
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LEGEND, ABBREVIATIONS,  
 INDEX, GENERAL NOTES  
 AND BENCHMARK

G-1



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 MADISON, WISCONSIN**

UNIT WELL 20  
 PUMP AND MCC UPGRADES

SHEET TITLE

EXISTING SITE PLAN

C-1

- NOTES:
- EXCAVATE TO EXPOSE EXISTING 10" D.I. WATER MAIN. RESTRAIN EXISTING 10" ISOLATION VALVE TO PREVENT MOVEMENT DURING WATER MAIN REPLACEMENT EFFORTS. DISCONNECT AND REMOVE EXISTING 10" BOOSTER SUCTION LINE BETWEEN EXISTING ISOLATION VALVE AND WELL HOUSE. INSTALL 10"x16" REDUCER AND NEW 16" D.I. PIPING INTO WELL HOUSE FOR NEW SUCTION PIPING TO BOOSTER PUMP 1.
  - WOOD FENCE, CELL EQUIPMENT AND LANDSCAPING SOUTH OF CELL COMPOUND ARE PROPOSED FOR EARLY 2013 CONSTRUCTION.
  - INSTALL SILT FENCE AND MAINTAIN UNTIL WATER MAIN IS INSTALLED, TESTED AND DISTURBED AREA TOPSOILED, SEEDED AND MULCHED.
  - REFER TO SPECIFICATIONS FOR TEMPORARY PUMPING REQUIREMENTS BETWEEN LOW AND HIGH PRESSURE ZONE HYDRANTS.

NOT FOR BIDDING

NO.	DATE	DESCRIPTION

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1" 5" 0 1" 2" 3"

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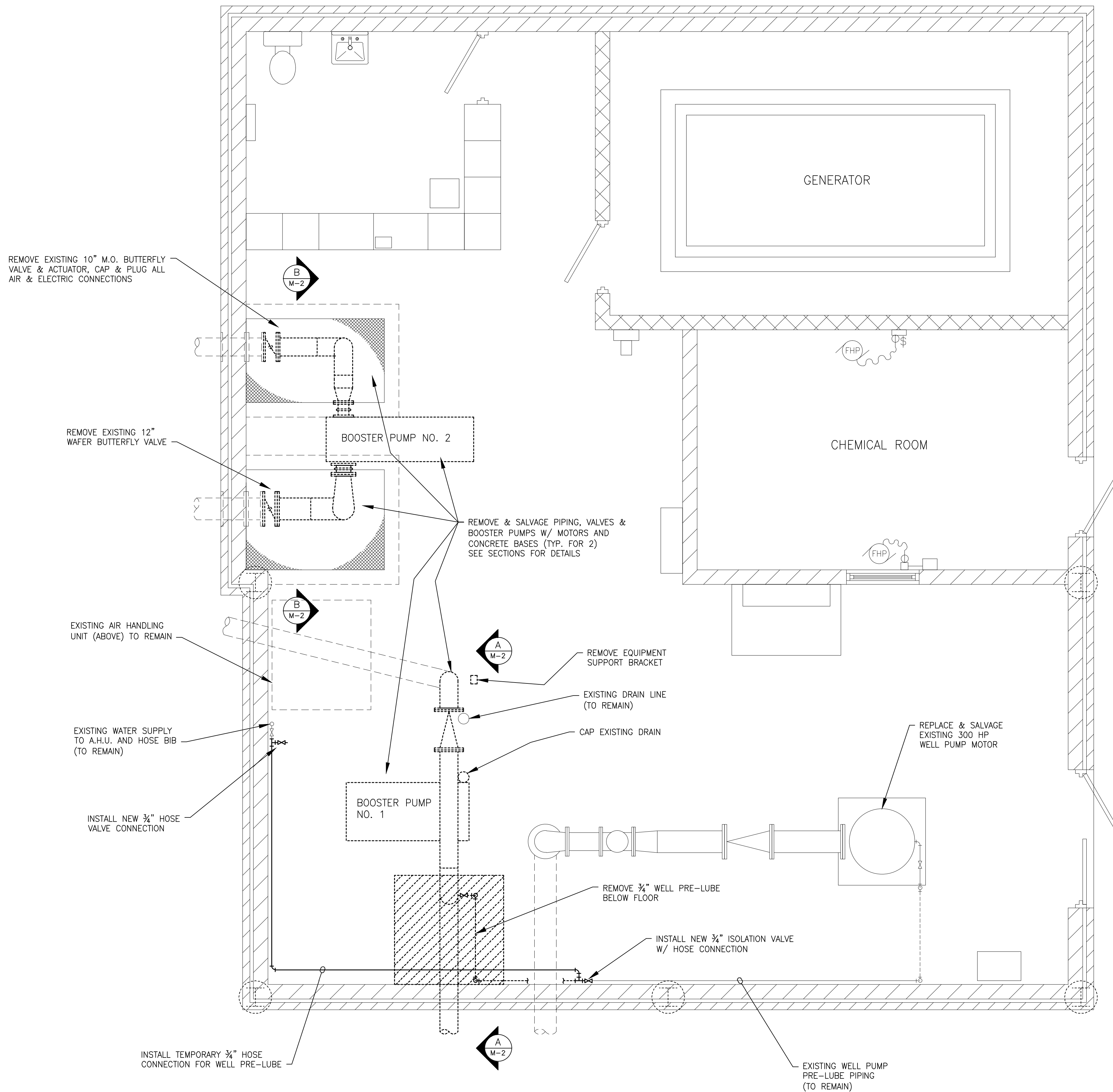
MADISON WATER UTILITY  
 MADISON, WISCONSIN

UNIT WELL 20  
 PUMP AND MCC UPGRADES

SHEET TITLE

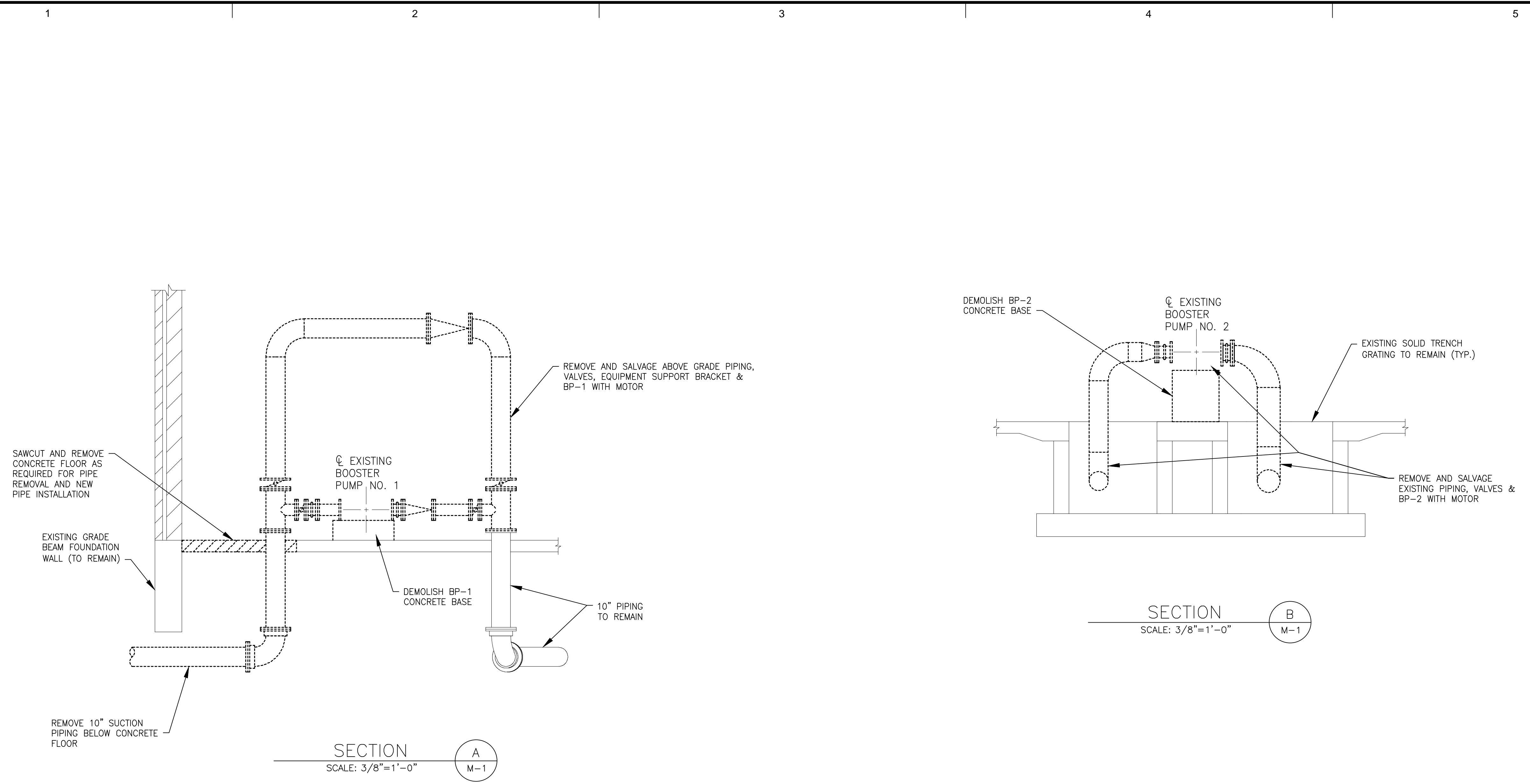
DEMOLITION FLOOR PLAN

M-1



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

CONSULTANTS



REVISIONS		NO.	DATE	DESCRIPTION

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**MADISON WATER UTILITY**  
**MADISON, WISCONSIN**

UNIT WELL 20  
 PUMP AND MCC UPGRADES

SHEET TITLE

**DEMOLITION SECTIONS**

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 MADISON, WISCONSIN**

**UNIT WELL 20  
 PUMP AND MCC UPGRADES**

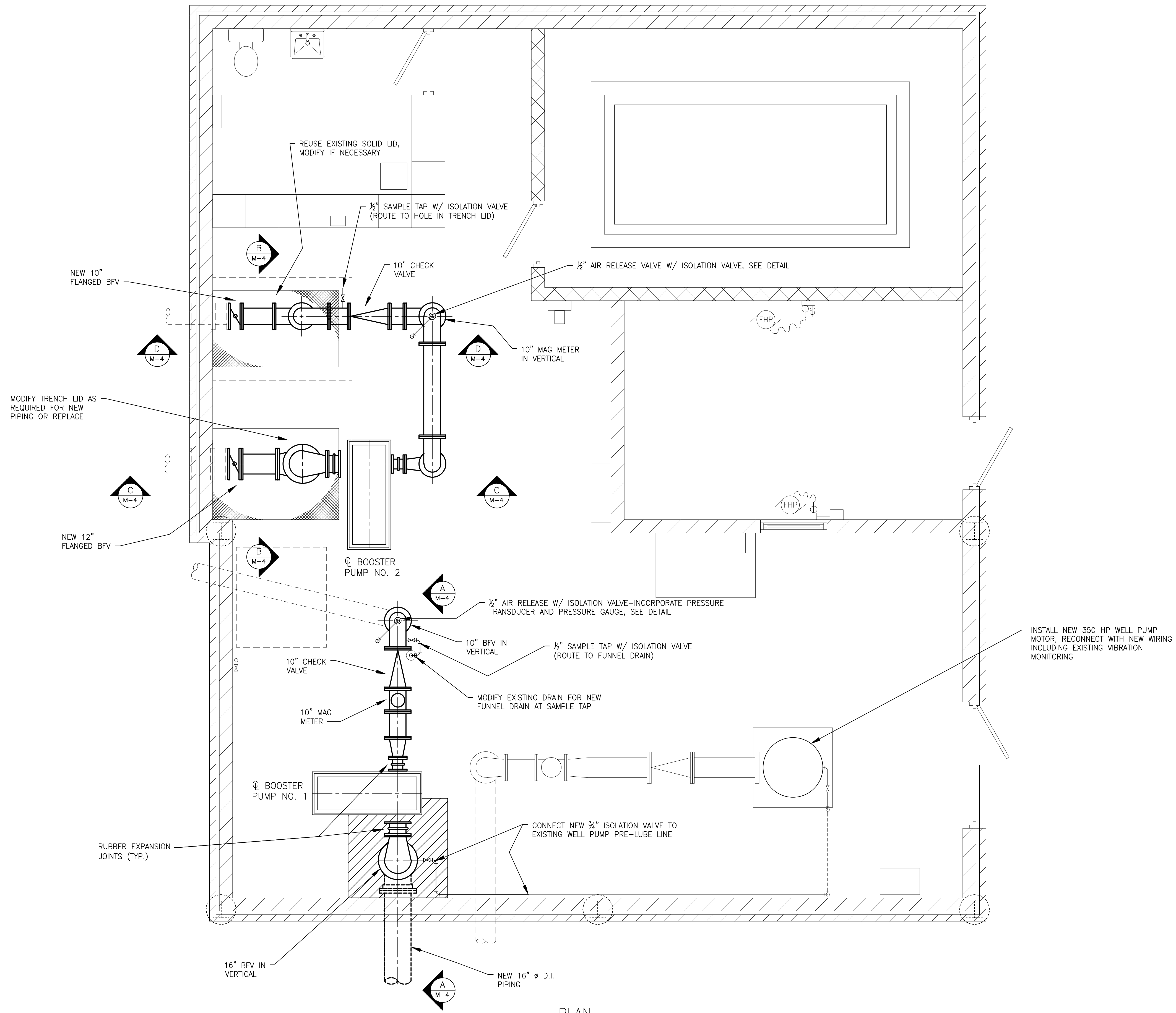
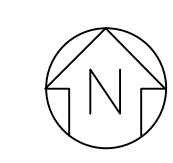
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EXISTING FLOOR PLAN

**M-3**

1 2 3 4 5

D  
C  
B  
A



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

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1 2 3 4 5 NOT FOR BIDDING

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1" 5" 0 1" 2" 3"

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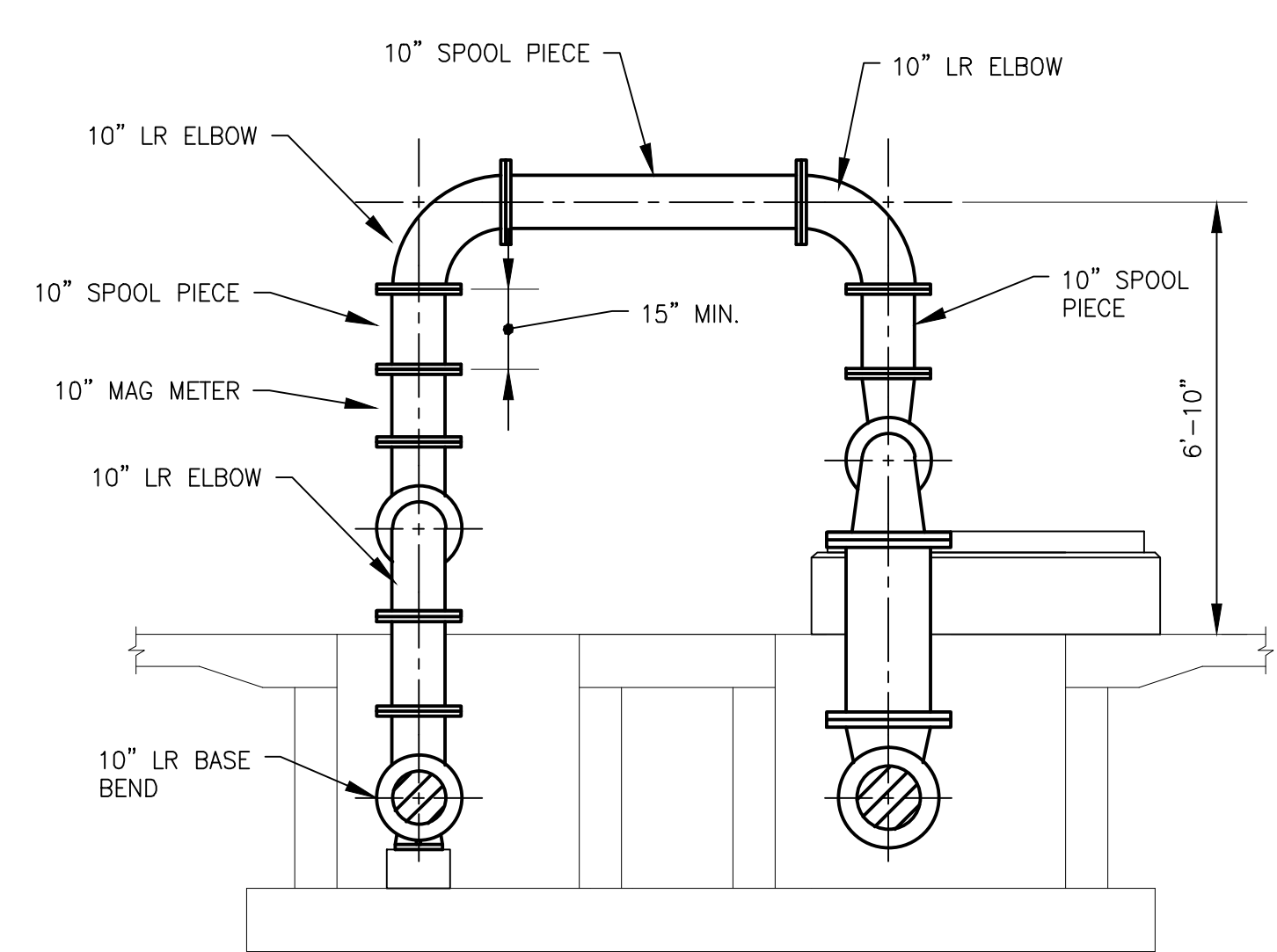
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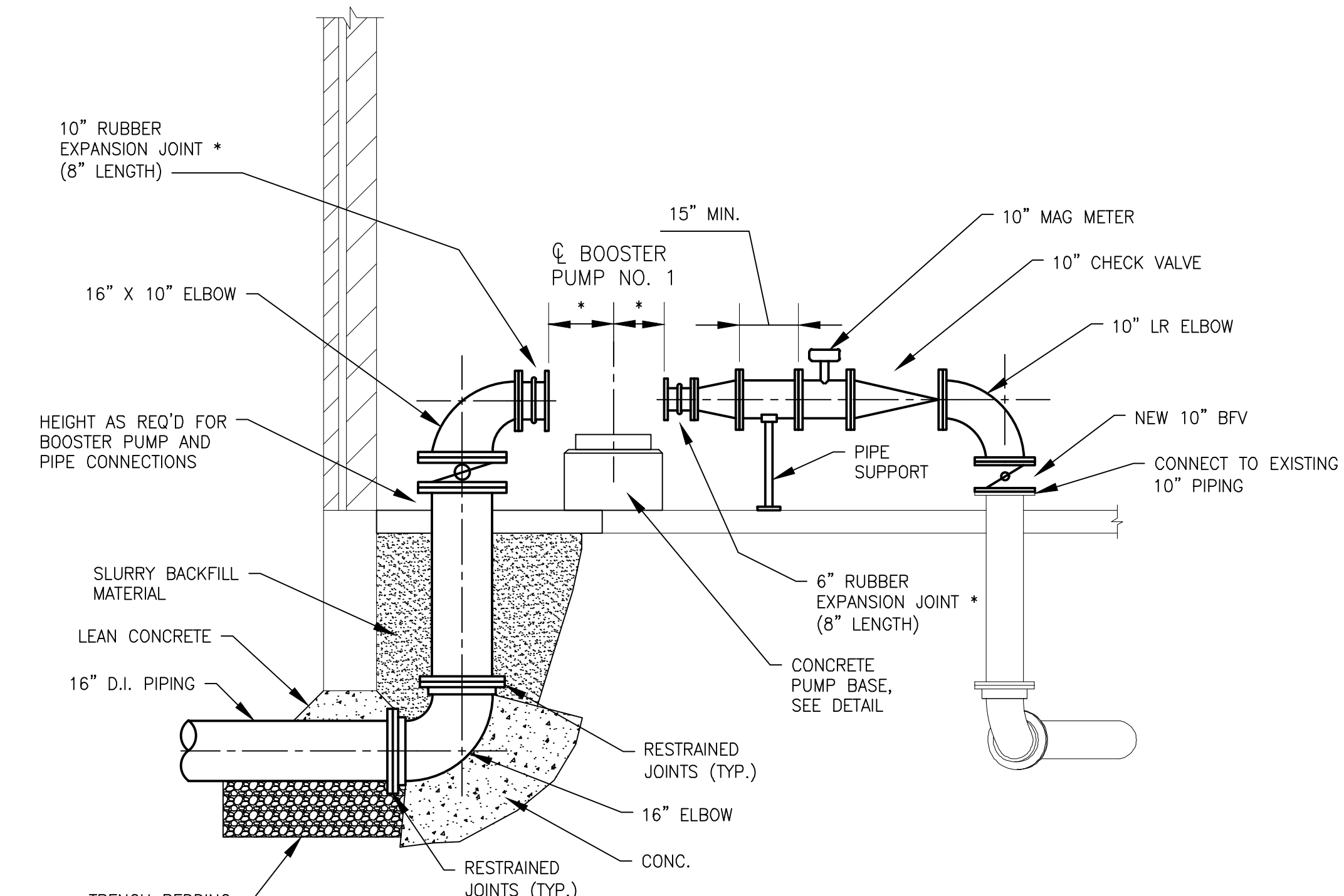
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EXISTING SECTIONS



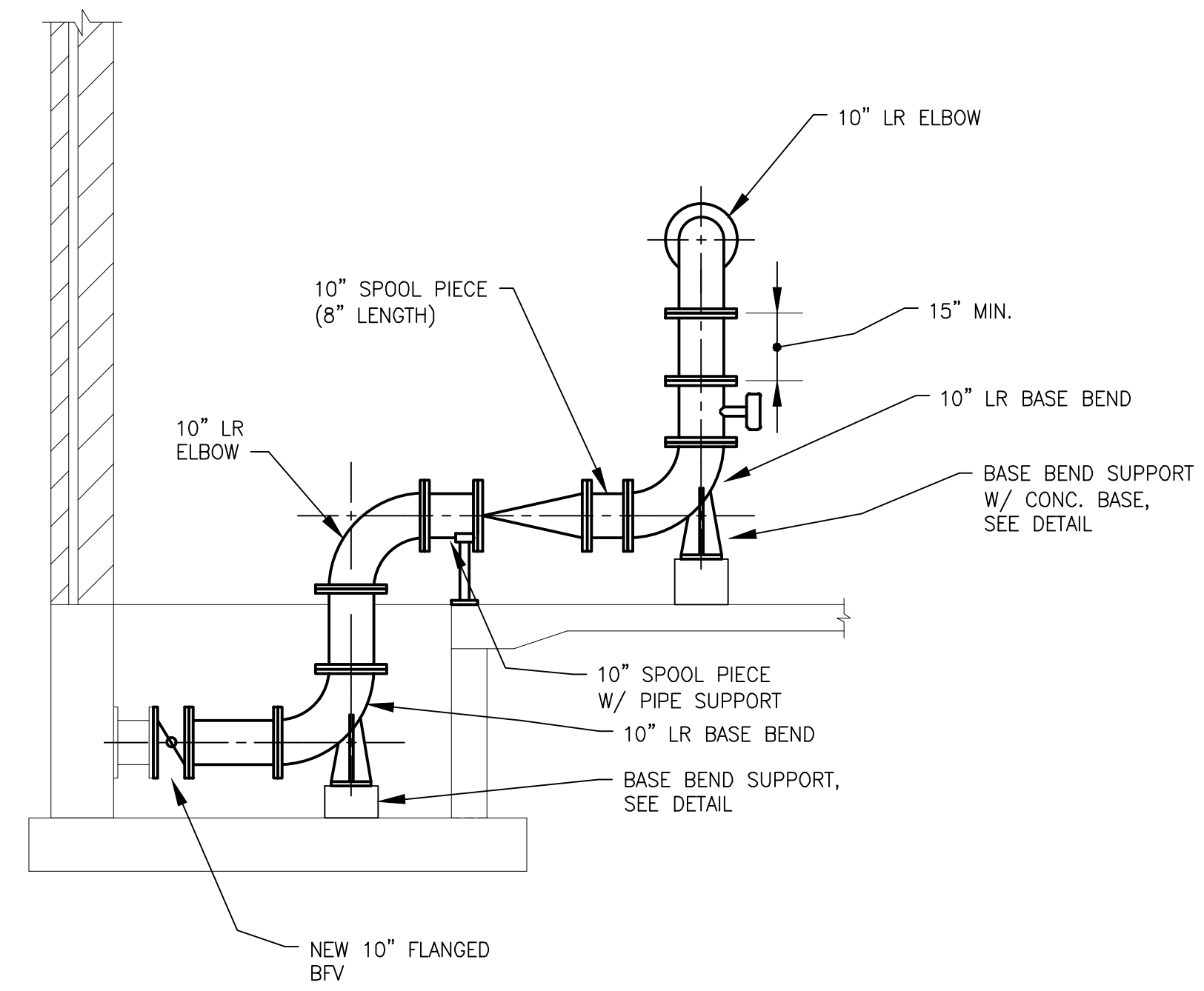
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\* DIMENSIONS AND SIZES PER BOOSTER PUMP MANUFACTURER

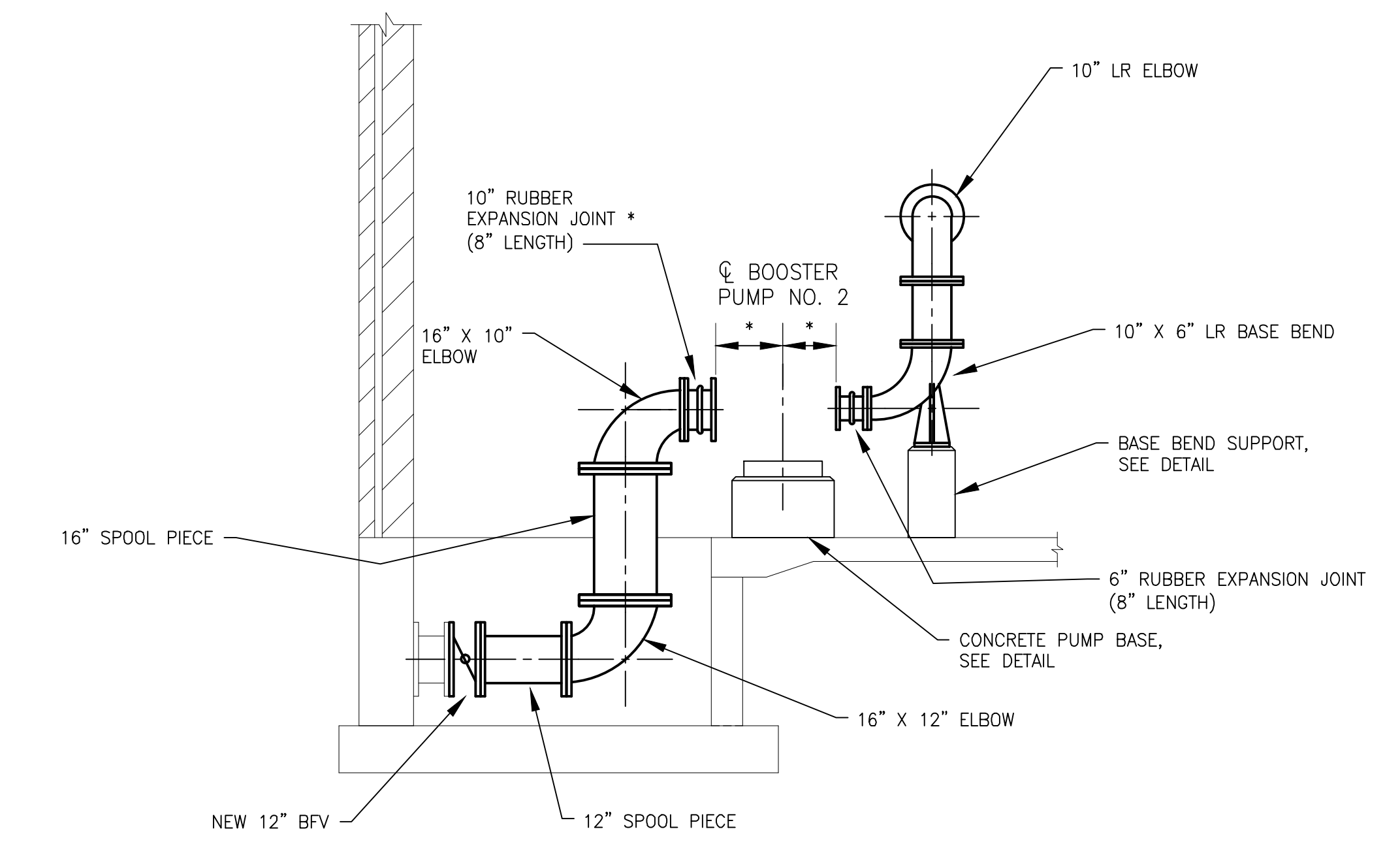


SECTION A  
SCALE: 3/8"=1'-0"

\* DIMENSIONS AND SIZES PER BOOSTER PUMP MANUFACTURER



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



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

\* DIMENSIONS AND SIZES PER BOOSTER PUMP MANUFACTURER



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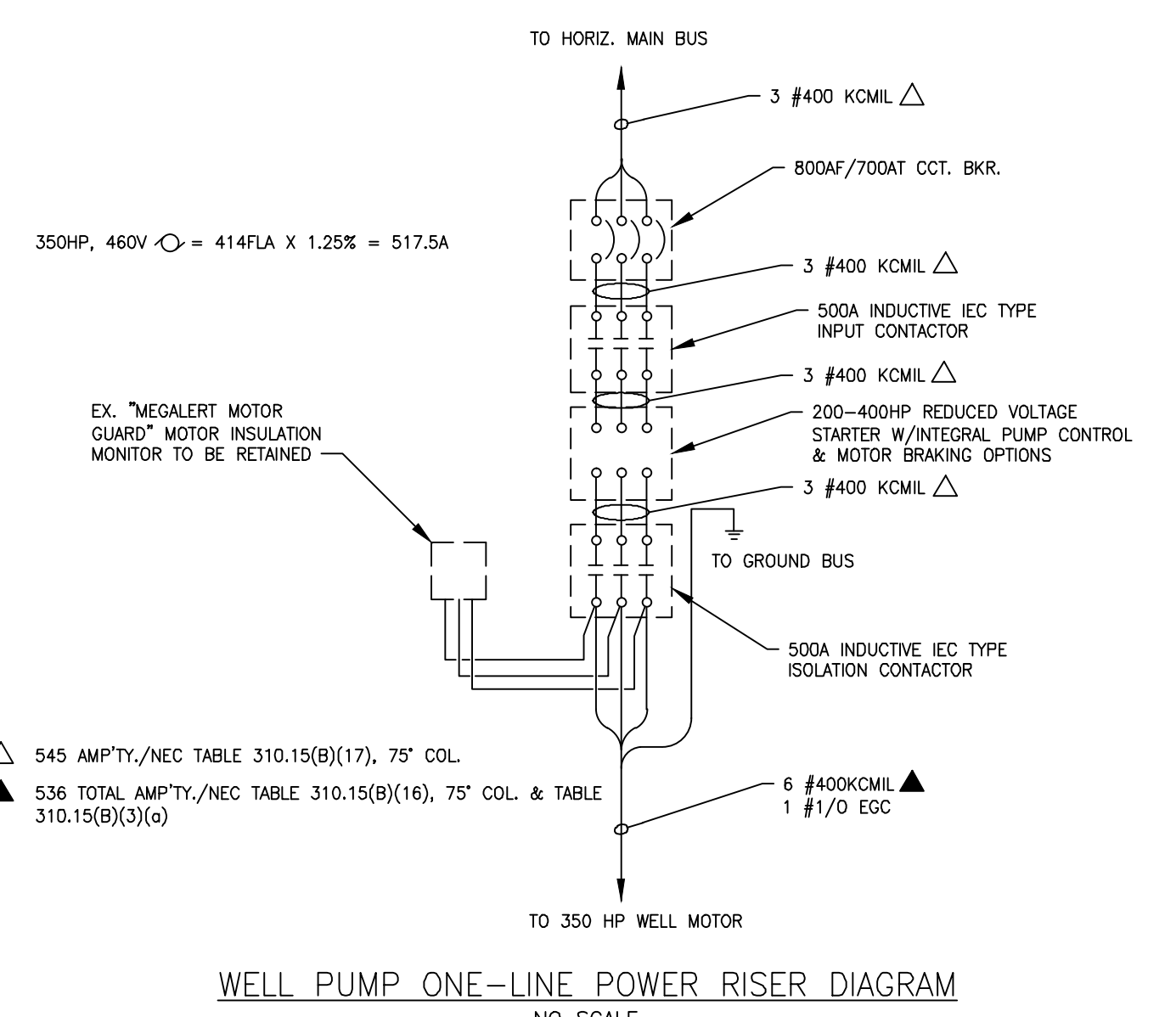
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PUMP AND MCC UPGRADES**

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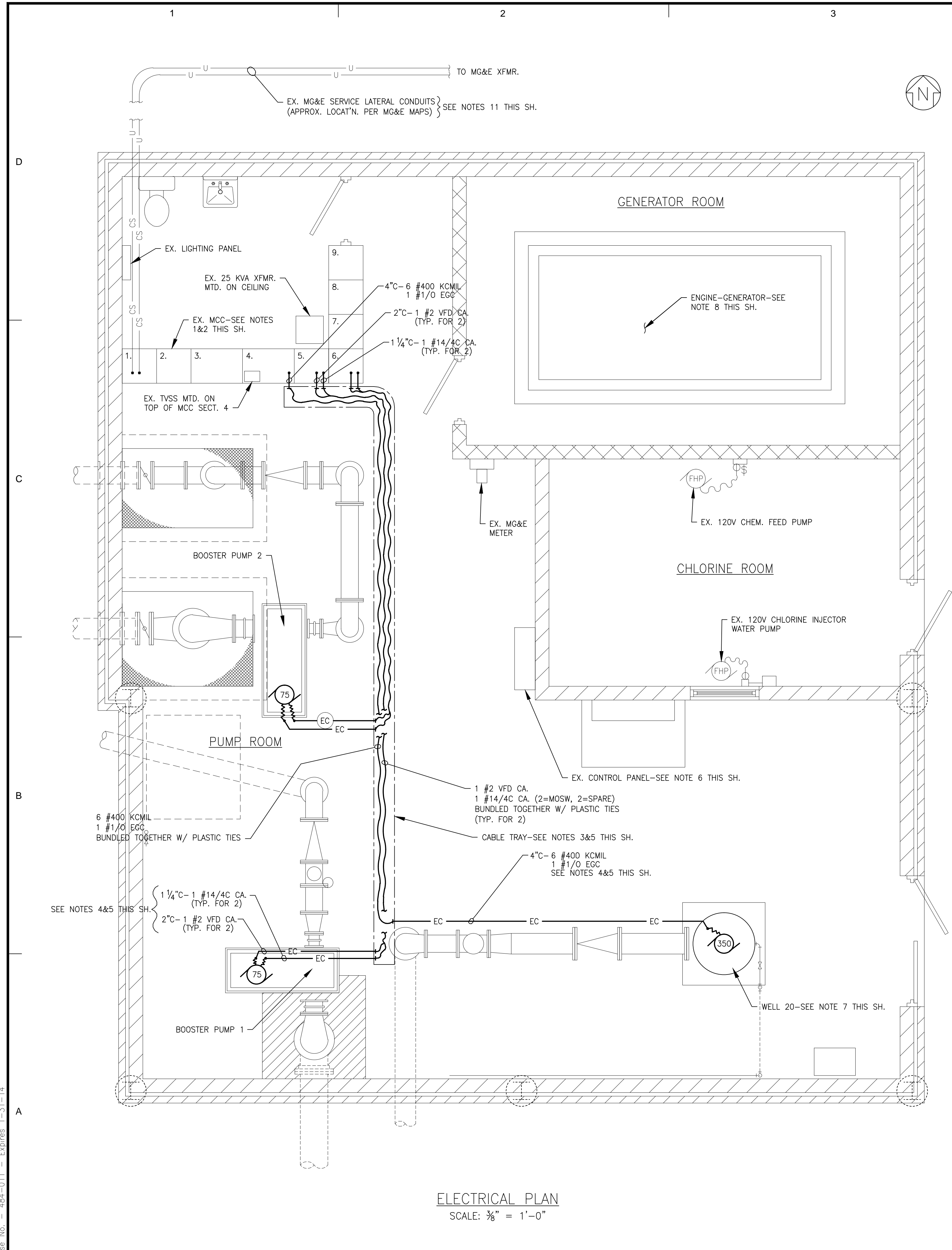
**ELECTRICAL PLAN**

**E-1**

- NOTES:**
- REPLACEMENT CIRCUIT BREAKERS, SOFT STARTER & VFDs INDICATED IN NOTE 2 FOR SECTIONS 1, 4, 5&6 ARE TO BE FURNISHED BY OWNER & INSTALLED BY CONTRACTOR. MOUNTING HARDWARE, CONTACTORS, CONTROL DEVICES & MISC. TO BE PROVIDED BY CONTRACTOR. ALL OR SOME SIEMENS REPLACEMENT CIRCUIT BREAKERS & ACCESSORIES THAT ARE LISTED MAY, AT OWNER'S DISCRETION, BE SUBSTITUTED WITH AN EATON/CUTLER-HAMMER EQUIVALENT.
  - MODIFY EXISTING FURNAS SYSTEM 89 MOTOR CONTROL CENTER AS FOLLOWS:
    - SECTION 1:** REMOVE 80% RATED MAIN CIRCUIT BREAKER & DOOR (SIEMENS SENTRON CAT. # MXD63S800A, 800A FRAME/800A TRIP/3P W/ INVERTED CONNECTIONS)-REPLACE W/ 100% RATED MAIN CIRCUIT BREAKER (SIEMENS SENTRON CAT. # MXD63S800H, 800A FRAME/800A TRIP/3P W/ INVERTED CONNECTIONS (LINE @ BOTTOM, LOAD @ TOP) & CAT. # D66501-678 DOOR W/ PADLOCK HASP & LOTO PROVISIONS. SEE NOTE 13.
    - SECTION 2:** REMOVE DIGITAL METER & CHART RECORDER-CLOSE OPENINGS ON HINGED DOOR AFTER REMOVAL OF METER & RECORDER.
    - SECTION 3:** PROVIDE AUTHORIZED SERVICE TECHNICIAN FROM MFR. OF AUTOMATIC TRANSFER SWITCH TO EXAMINE AUTOMATIC TRANSFER SWITCH & PERFORM MAINTENANCE (INCLUDING REPLACEMENT OF DEFECTIVE PARTS) DEEMED TO BE NECESSARY RESULTING FROM EXAMINATION & FROM INPUT PROVIDED BY OWNER'S MAINTENANCE ELECTRICIAN.
    - SECTION 4:**
      - a) REMOVE ALL EQUIPMENT EXCEPT MOTOR INSULATION MONITOR & ASSOCIATED POWER SUPPLY & WIRING.
      - b) REPLACE CIRCUIT BREAKER WITH 800AF/700AT/3P (SIEMENS SENTRON CAT. # MXD63B700, OR EQUAL BY EATON/CUTLER-HAMMER). REPLACE CIRCUIT BREAKER OPERATING HANDLE AS REQ'D TO ACHIEVE CORRECT OPERATION OF CIRCUIT BREAKER TOGGLE & DOOR INTERLOCK. REPLACEMENT CIRCUIT BREAKER OPERATING HANDLE MUST INCLUDE LOTO PROVISIONS, DOOR INTERLOCK & DEFEATER SCREW.
      - c) REPLACE INPUT CONTACTOR & ISOLATION CONTACTOR WITH ROCKWELL/ALLEN-BRADLEY OR EATON/CUTLER-HAMMER IEC TYPE CONTACTORS HAVING 500A INDUCTIVE LOAD RATING, 120VAC COIL & LUGS LISTED FOR NUMBER & AWG SIZE OF WIRES SHOWN ONE-LINE DIAGRAM THIS SHEET.
      - d) REPLACE FURNAS NORDIC 150-350HP SOFT STARTER & EXTERNAL DC BRAKE COMPONENTS WITH ROCKWELL/ALLEN-BRADLEY 200-400HP SMC-FLEX COMPLETE WITH INTEGRAL PUMP CONTROL & MOTOR BRAKING OPTIONS.
      - e) EXISTING MOTOR INSULATION MONITOR (INCLUDING POWER SUPPLY & WIRING) TO REMAIN IN SERVICE, BUT MAY BE RELOCATED WITHIN THIS MCC SECTION TO ALLOW ROOM FOR OTHER EQUIPMENT DESCRIBED ABOVE.
      - f) RE-USE EXISTING CONTROL & INDICATION DEVICES ON DOOR OF SECTION 4 & RELOCATE EXISTING KEY-OPERATED SWITCH & ELECTRODE INDICATORS & H-O-A SWITCH ON CONTROL PANEL ON SECTION 8 TO DOOR OF SECTION 4.
      - g) CONNECT PER WELL PUMP ONE-LINE POWER RISER DIAGRAM SHOWN ON THIS SHEET. PROVIDE CONTROL WIRING PER ALTONIX WIRING DIAGRAM.
    - SECTION 5:**
      - a) PROVIDE 150A/3P, F-FRAME CIRCUIT BREAKER FOR PROPOSED 75HP BOOSTER PUMP 1 (SIEMENS SENTRON CAT. # HFD63B150, OR EQUAL BY EATON/CUTLER-HAMMER). PROVIDE CIRCUIT BREAKER OPERATING HANDLE WITH LOTO PROVISIONS, DOOR INTERLOCK & DEFEATER SCREW.
      - b) PROVIDE ROCKWELL/ALLEN-BRADLEY POWERFLEX 753, 75HP VFD WITH LINE REATOR & HUMAN MACHINE INTERFACE (HMI) MODULE.
      - c) PROVIDE SELECTOR SWITCHES & PILOTLIGHTS MOUNTED ON DOOR OF THIS SECTION TO REPLACE EXISTING LIKE DEVICES LOCATED ON DOOR FOR EXISTING BOOSTER PUMP VFD IN SECTION 6 & ON EXISTING CONTROL PANEL ON SECTION 8.
      - d) PROVIDE ENGRAVED NAMEPLATE ON DOOR TO READ "BOOSTER PUMP 1".
    - SECTION 6:** REMOVE 2 VFDs, CIRCUIT BREAKERS & ALL RELATED EQUIPMENT-INSTALL EQUIPMENT (SAME AS SPECIFIED FOR SECTION 5) FOR PROPOSED 75HP BOOSTER PUMP 2-PROVIDE ENGRAVED NAMEPLATE TO READ "BOOSTER PUMP 2".
    - SECTION 7:** RELOCATE H-O-A SELECTOR SWITCH FOR AIR CONDITIONER ON EXISTING CONTROL PANEL ON SECTION 8 TO RESPECTIVE UNIT DOOR ON SECTION 7.
    - SECTION 8&9:**
      - a) REMOVE EXISTING CONTROL PANEL ON SECTION 8.
      - b) PROVIDE PLC BASED CONTROL & ALARM SYSTEM WITH TOUCH SCREEN, PROGRAMMING PORT & UPS, HAVING SAME FUNCTIONALITY AS SYSTEM AT UNIT WELL 30, WHICH WAS PROVIDED BY ALTRONEX CONTROL SYSTEMS DIVISION OF L.W. ALLEN, INC.
  - HANG CABLE TRAY BELOW SUSPENDED CEILING IN TRAPEZE FASHION W/ GALV. STL. CHANNELS SPACED 4'-0" O.C. ATTACHED TO 1/2" THREADED GALV. RODS FASTENED TO UNDERSIDE OF ROOF STRUCTURE W/ STN. STL. EXPANSION ANCHORS.
  - HANG EXPOSED CONDUITS ON CEILING W/ CONDUIT CLAMPS ATTACHED TO 1/2" THREADED GALV. RODS FASTENED TO UNDERSIDE OF ROOF STRUCTURE W/ STN. STL. EXPANSION ANCHORS.
  - DO NOT OBSTRUCT EXISTING LIGHT FIXTURES (NOT SHOWN). RELOCATE LIGHT FIXTURES &/OR REPOSITION CABLE TRAY & EXPOSED CONDUITS ON CEILING FROM WHERE SHOWN AS REQUIRED.
  - MODIFICATIONS TO EXISTING CONTROL PANEL ARE TO BE PROVIDED BY ALTRONEX CONTROL SYSTEMS & ARE TO REMOVAL OF EXISTING AQUATROL EQUIPMENT & CONVERSION OF ENCLOSURE INTO A PULL BOX FOR EXISTING WIRES/CABLES RUNNING FROM EXISTING &/OR NEW EQUIPMENT TO CONTROL PANEL IN MCC SECTIONS 8&9 AS DESCRIBED IN NOTE 2. CONTRACTOR TO COORDINATE W/ ALTRONEX REGARDING ANY INTERCONNECTIONS (CONDUITS & WIRES/CABLES) REQUIRED BY ALTRONEX FROM CONTROL PANEL TO MCC OR OTHER EQUIPMENT.
  - REINSTALL EXISTING VIBRATION SENSOR & EXISTING TVSS (NOT SHOWN) ON REPLACEMENT WELL PUMP MOTOR.
  - PROVIDE AUTHORIZED SERVICE TECHNICIAN FROM MFR. OF ENGINE-GENERATOR TO EXAMINE ENGINE-GENERATOR & PERFORM MAINTENANCE (INCLUDING REPLACEMENT OF DEFECTIVE PARTS) DEEMED TO BE NECESSARY RESULTING FROM EXAMINATION & FROM INPUT PROVIDED BY OWNER'S MAINTENANCE ELECTRICIAN.
  - REMOVE EXISTING POWER WIRES & FLEXIBLE CONDUITS SERVING WELL MOTOR & BOOSTER PUMP MOTORS. PROVIDE PLUG OR CAP ON CONDUIT STUB @ EA. PUMP.
  - BOND CABLE TRAY TO EX. MCC W/ 1 # 1/0 EGC & SUITABLE LUGS.
  - COORDINATE THE REPLACEMENT BY MG&E OF THEIR DUAL SETS OF 4 #350KCMIL CU SERVICE LATERAL WIRES WITH DUAL SETS OF 4 #500KCMIL CU SERVICE LATERAL WIRES.
  - ALL WORK REQUIRING SHUTDOWN OF EQUIPMENT SHALL BE PERFORMED AT THE OWNER'S CONVENIENCE. NO SHUTDOWN OF EQUIPMENT SHALL BE PERFORMED WITHOUT OWNER'S APPROVAL. THE CONTRACTOR SHALL INCLUDE ALL PREMIUM TIME REQUIRED TO DO THIS WORK IN HIS BID.
  - PROVIDE ARC-FLASH HAZARD WARNING IN COMPLIANCE WITH NEC 110.16 ON EACH HINGED DOOR OF MCC.



**ELECTRICAL PLAN**  
SCALE: 3/8" = 1'-0"



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