



LAKE HAVASU CITY, ARIZONA  
ADMINISTRATIVE SERVICES DEPARTMENT  
◆ PROCUREMENT ◆

**INVITATION TO BID**  
**REPLACEMENT AND REFURBISHMENT OF THE HORIZONTAL**  
**COLLECTOR WELL PUMPS AND PIPING PROJECT**  
**B25-PW-108030-500434**  
**ADDENDUM NO. 2**  
**OCTOBER 4, 2024**

Attention is called to the following changes, additions, clarifications and/or deletions to the original solicitation and they shall be considered in preparing submissions:

**CHANGE IN THE OPENING DATE: NEW [BID] OPENING DATE IS OCTOBER 16, 2024.** There is no change in the opening time. **Submissions are due no later than 3:00 p.m., Arizona Time,** at the City Clerk's Office, 2330 McCulloch Blvd. N., Lake Havasu City, AZ 86403 or electronically via the City's DemandStar Network at <https://www.demandstar.com/app/buyers/bids/471451/details> .

If your bid is already in transit, the City Clerk's Office will hold it for opening on the New Bid Opening Date unless we are notified otherwise. If your bid has already been electronically submitted via DemandStar, you do have access to make changes prior to the time of the opening. Bidder may then email a Receipt Confirmation to [Purchasing@lhcaz.gov](mailto:Purchasing@lhcaz.gov) which will be placed with your bid package.

ITEM	ACTION	DESCRIPTION or ISSUE
1	CHANGE	The due date for this ITB has been changed to October 16, 2024. The time due for submissions remains 3:00 PM local Arizona Time.
2	ADDITION	The as built plans for the Horizontal Collector Well were not attached to Addendum 1 as original posted. They are hereby attached to this addendum (Addendum 2).

Andrew Klos, CPPB  
Senior Procurement Specialist



**LAKE HAVASU CITY - ARIZONA**  
**LONDON BRIDGE BEACH PUMP HOUSE**  
**PROJECT NO. W-183-00**

**Contract Drawings**

**2000**

**97-777-1-002**

APPROVED: \_\_\_\_\_  
CITY ENGINEER DATE

*Robert Schulz*  
ROBERT SCHULZ, P.E.  
BURNS & McDONNELL ENGINEERING CO., INC.  
(602) 385-4500

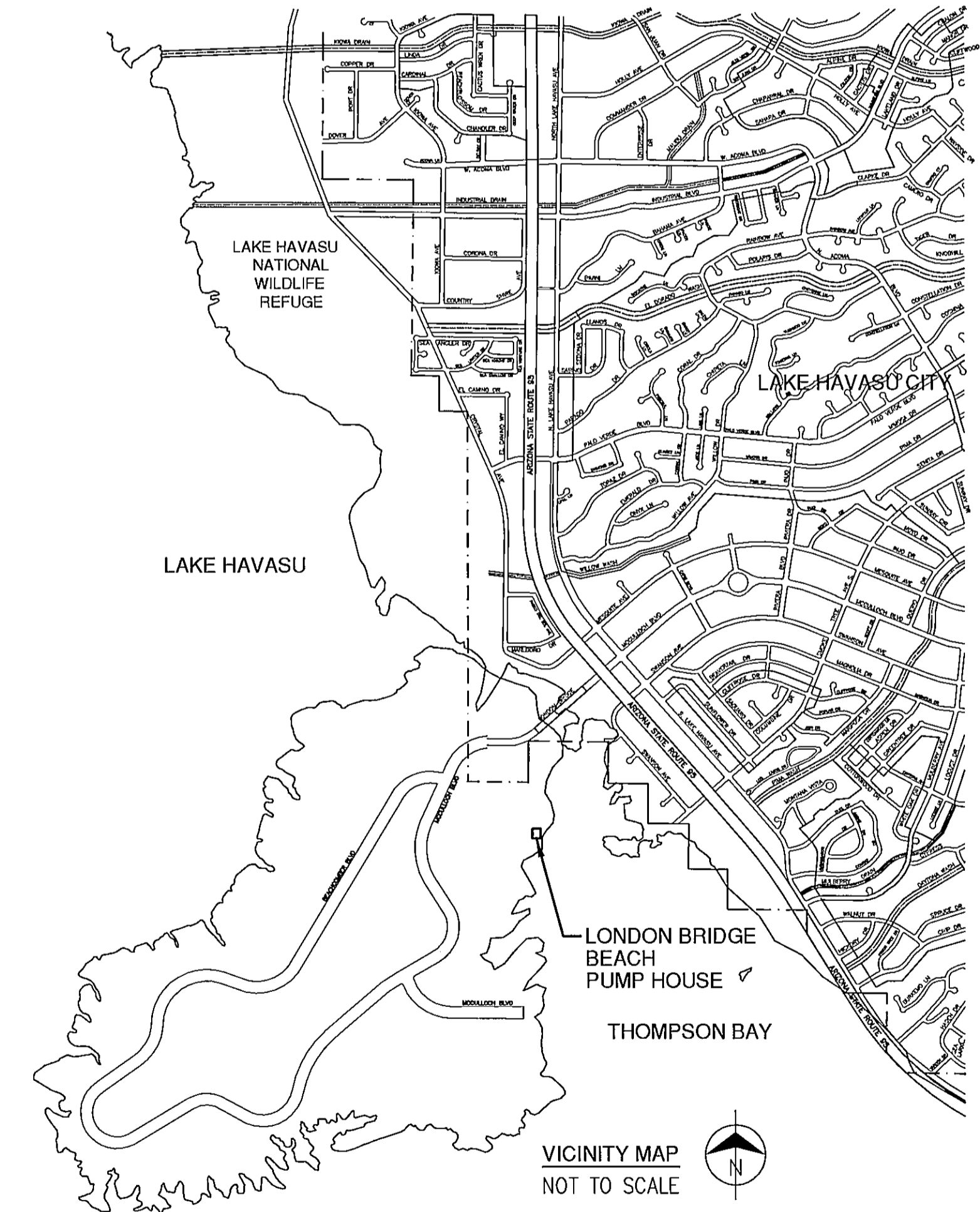
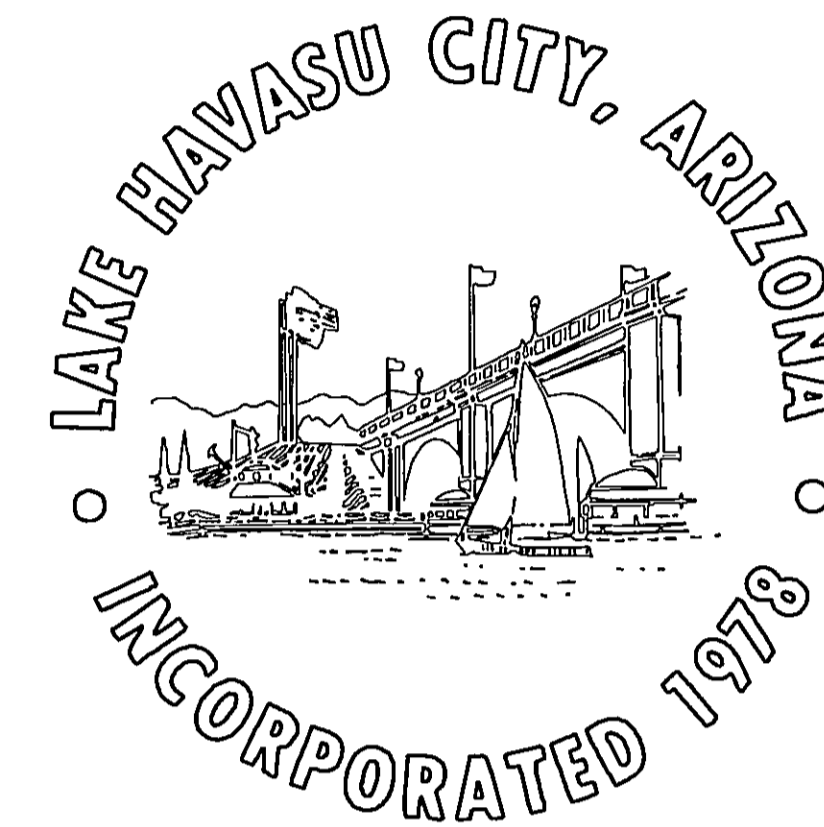


**"AS-BUILT"**



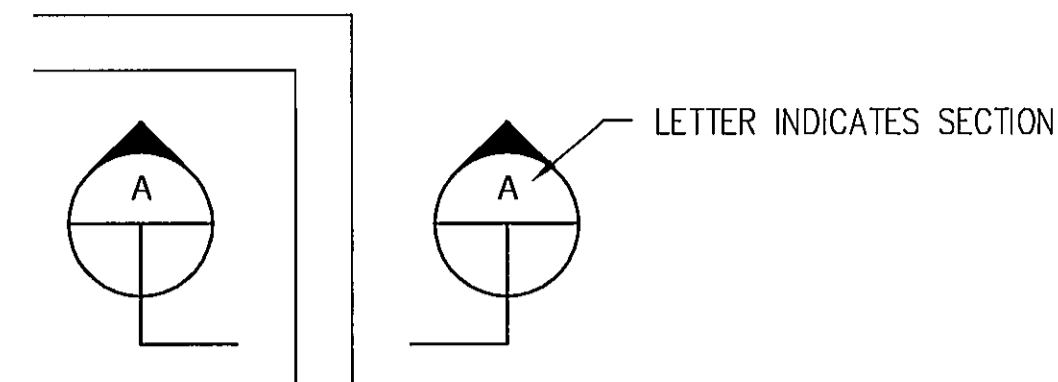
# Lake Havasu City, Arizona

## LONDON BRIDGE BEACH PUMP HOUSE

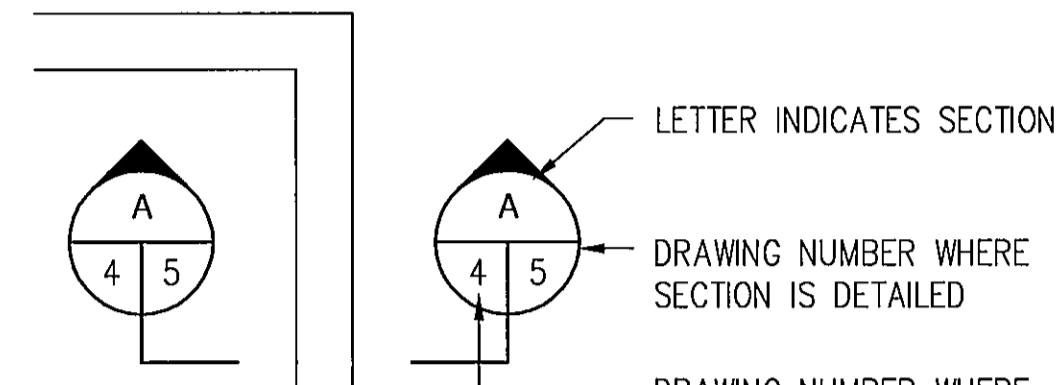


### List of Contract Drawings

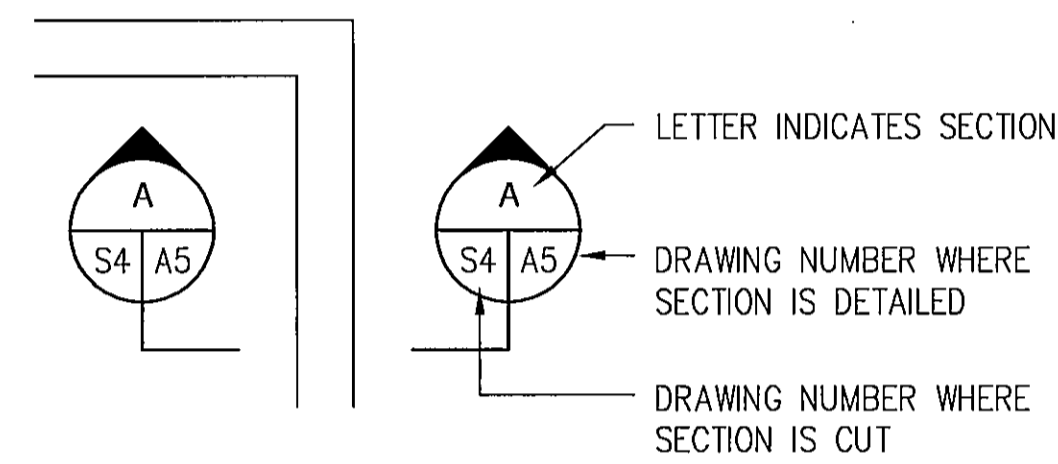
DRAWING NO.	TITLE
	COVER
	INDEX
C1	SITE PLAN AND DETAILS
C2	EQUIPMENT LAYOUT
A1	SCREEN WALL - PLAN, ELEVATION AND DETAILS
S1	STRUCTURAL LEGEND
S2	FOUNDATION PLAN AND DETAILS
S3	ROOF PLAN AND DETAILS
S4	DETAILS AND SECTIONS
P1	PROCESS LEGEND
P2	PARTIAL PLAN AND DETAILS
P3	SECTIONS AND DETAILS
M1	MECHANICAL LEGEND
M2	HVAC AND PLUMBING FLOOR PLAN AND HVAC CONTROL SEQUENCE OF OPERATION DIAGRAMS
M3	MISCELLANEOUS DETAILS AND SCHEDULES
E1	ELECTRICAL LEGEND
E2	ELECTRICAL ONE-LINE DIAGRAM
E3	ELECTRICAL POWER PLAN
E4	ELECTRICAL LIGHTING, SMALL POWER AND CONTROL PLAN
E5	PUMP CONTROL DIAGRAMS NO. 1
E6	PUMP CONTROL DIAGRAMS NO. 2
E7	PLC I/O WIRING DIAGRAMS AND MISC. DETAILS



SECTION CUT AND DRAWN ON SAME DRAWING.

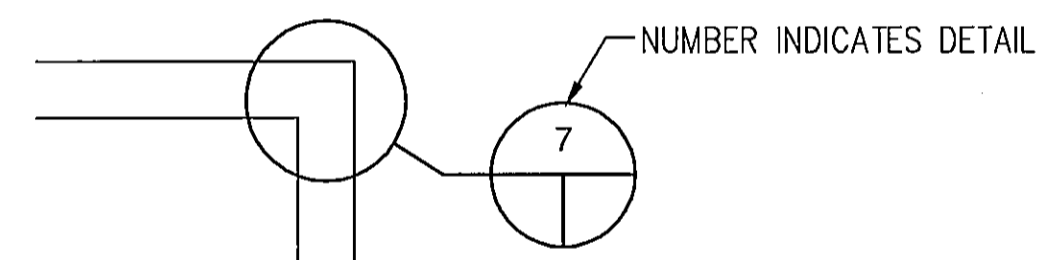


SECTION CUT ON ONE DRAWING AND DRAWN ON ANOTHER DRAWING WITHIN THE SAME DISCIPLINE.

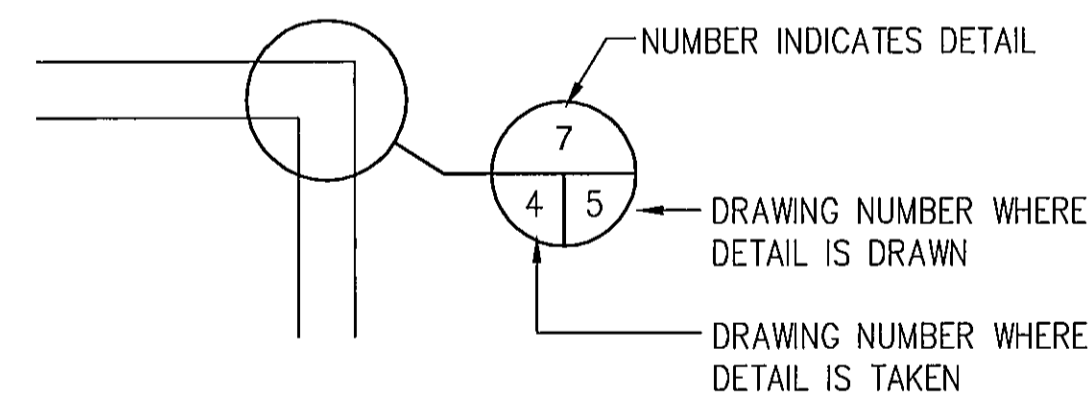


SECTION CUT ON DRAWING OF ONE DISCIPLINE AND DETAILED ON DRAWING OF ANOTHER DISCIPLINE.

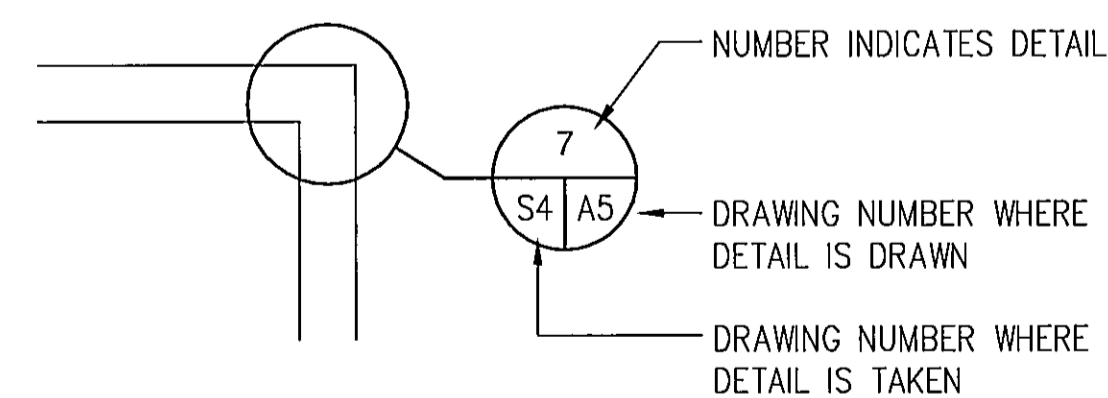
#### SECTION IDENTIFICATION



DETAIL TAKEN AND DRAWN ON SAME DRAWING.



DETAIL TAKEN ON ONE DRAWING AND DETAILED ON ANOTHER DRAWING WITHIN THE SAME DISCIPLINE.



DETAIL TAKEN ON DRAWING OF ONE DISCIPLINE AND DETAILED ON DRAWING OF ANOTHER DISCIPLINE.

#### DETAIL IDENTIFICATION

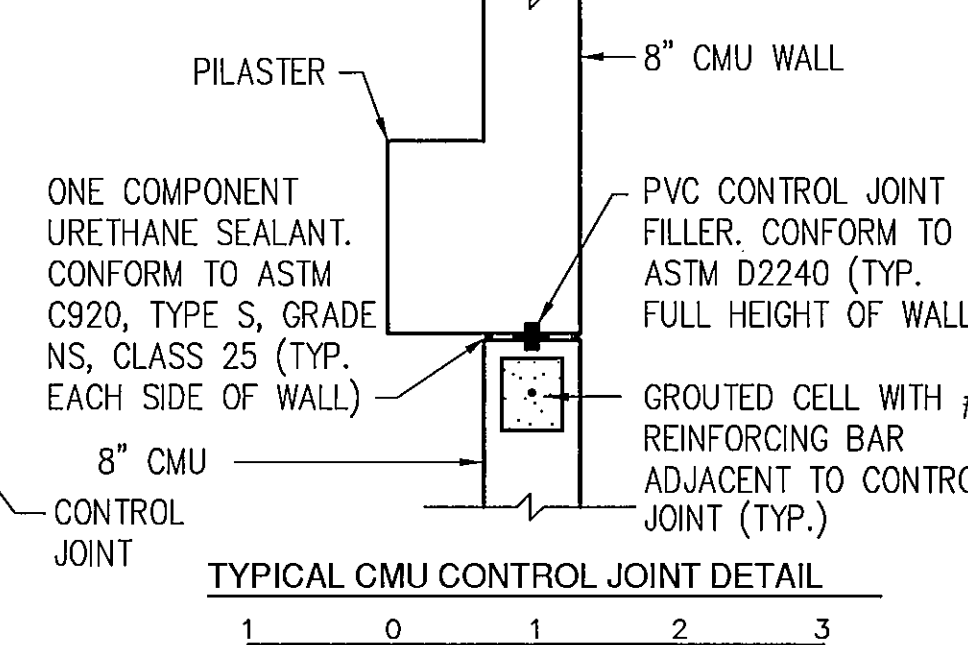
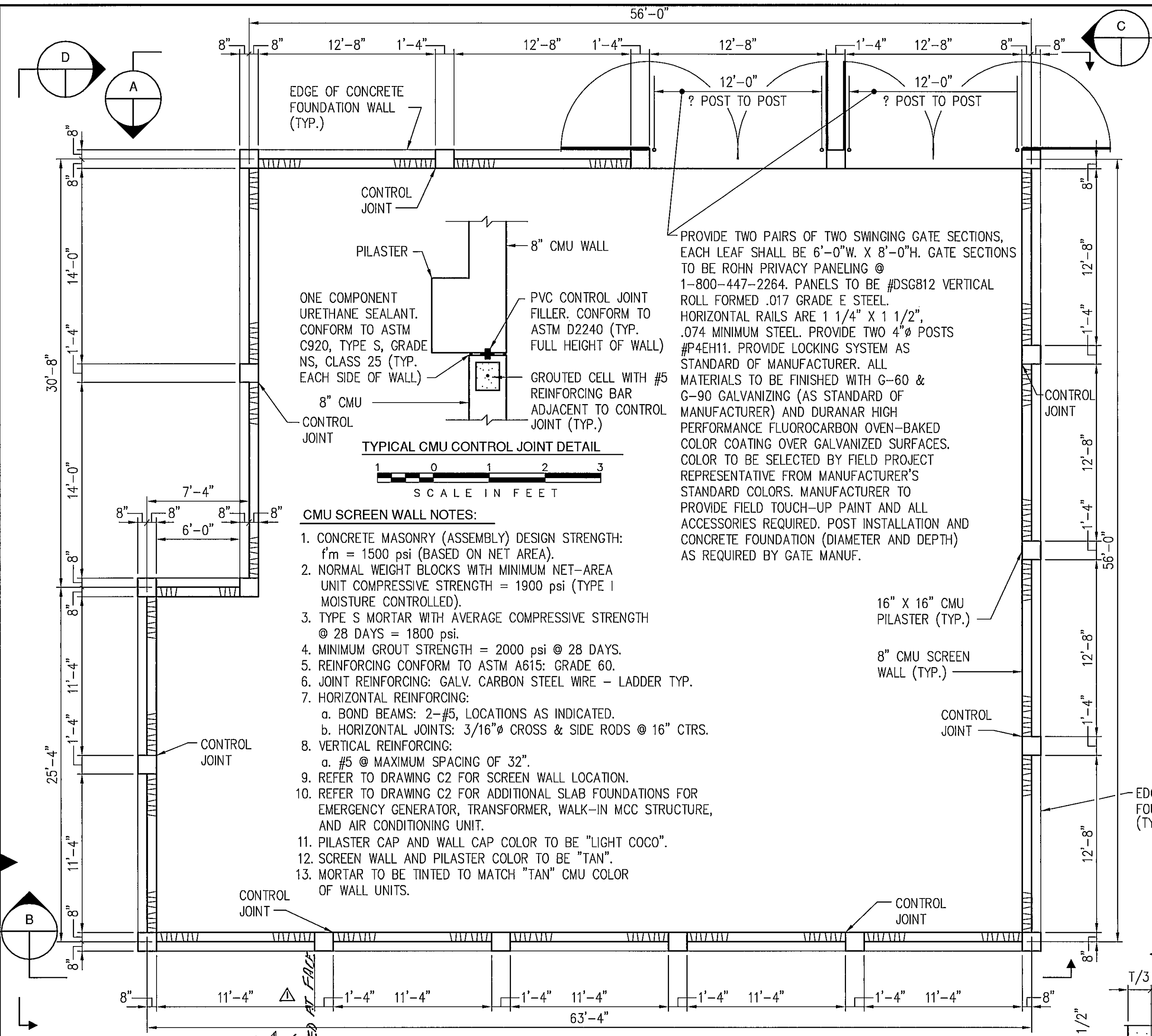
#### SECTION AND DETAIL IDENTIFICATION SYSTEMS

"AS-BUILT"

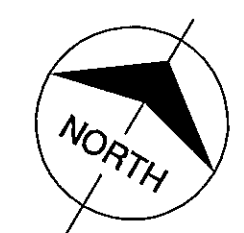
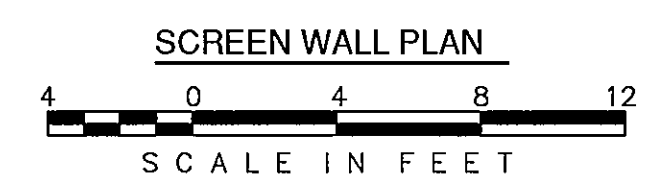


London Bridge Beach  
Pump House  
PROJECT NO: W-183-00

# INDEX



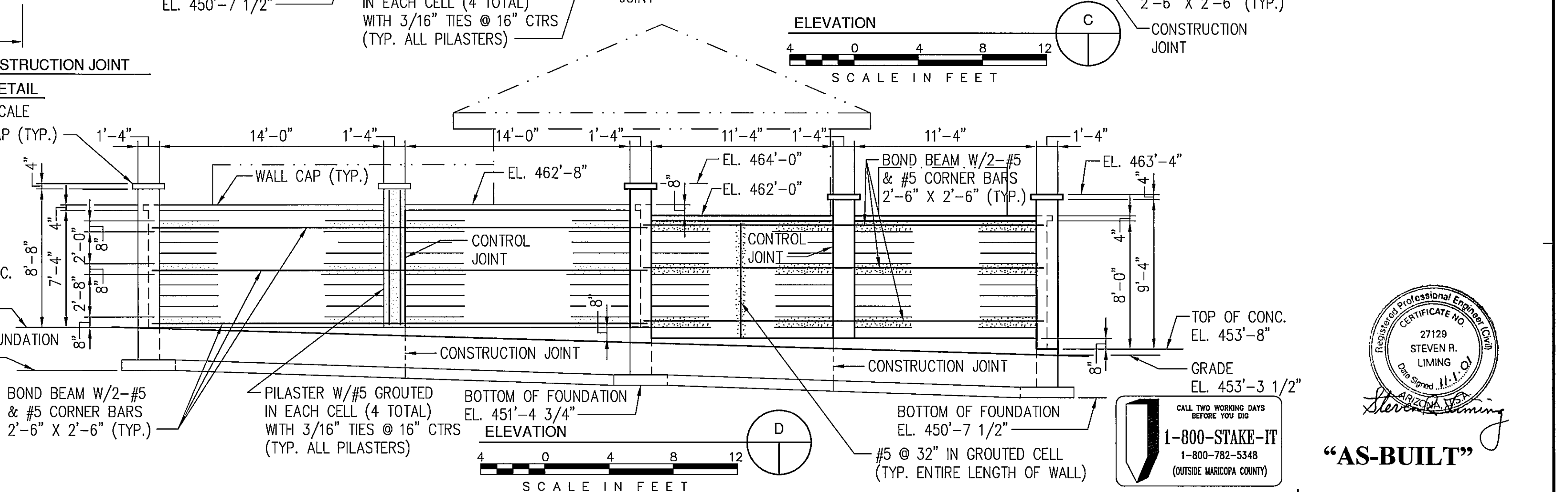
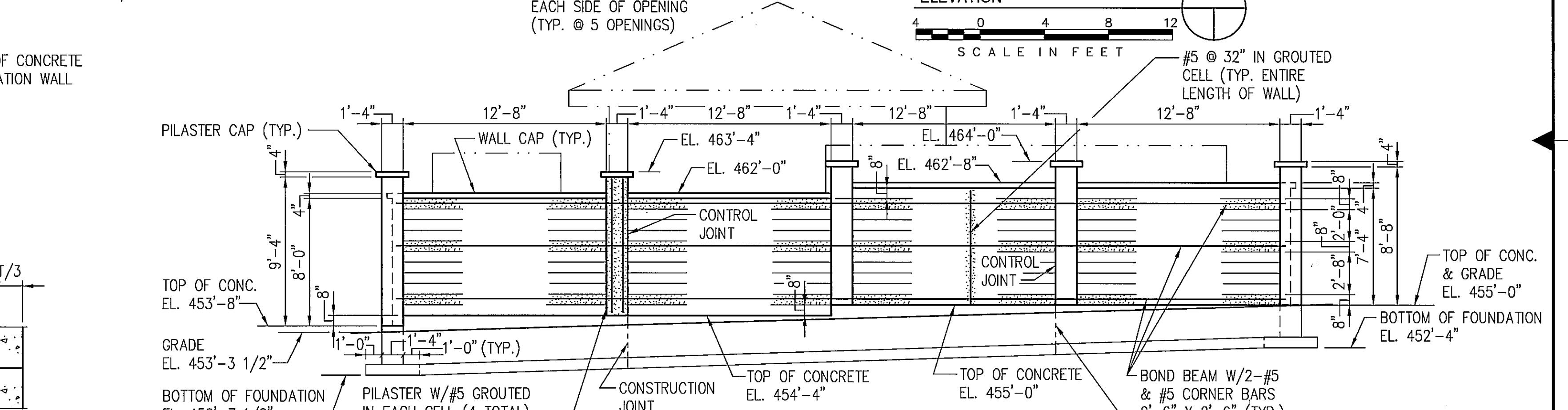
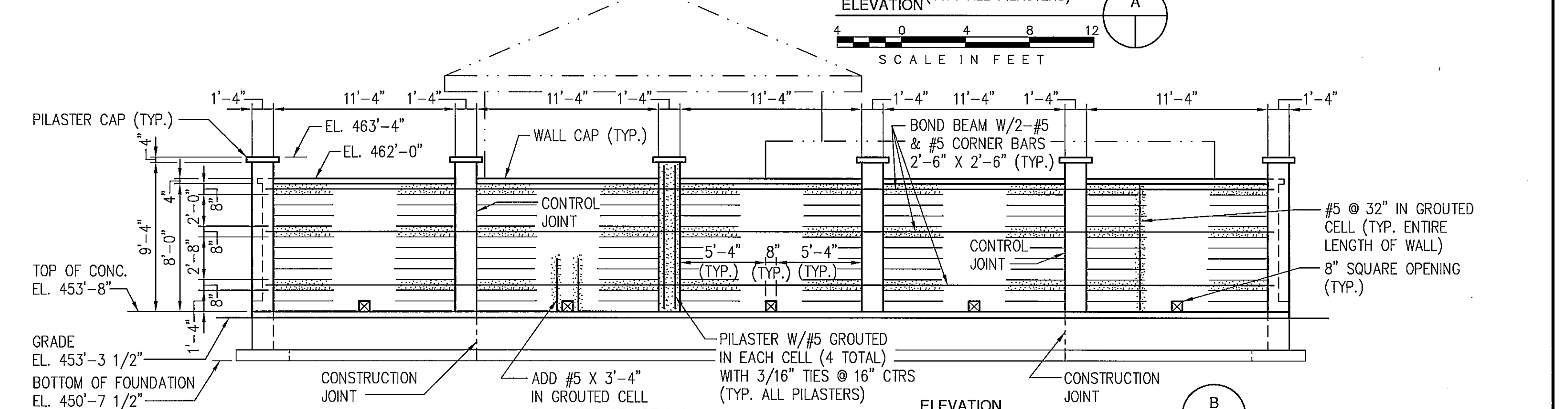
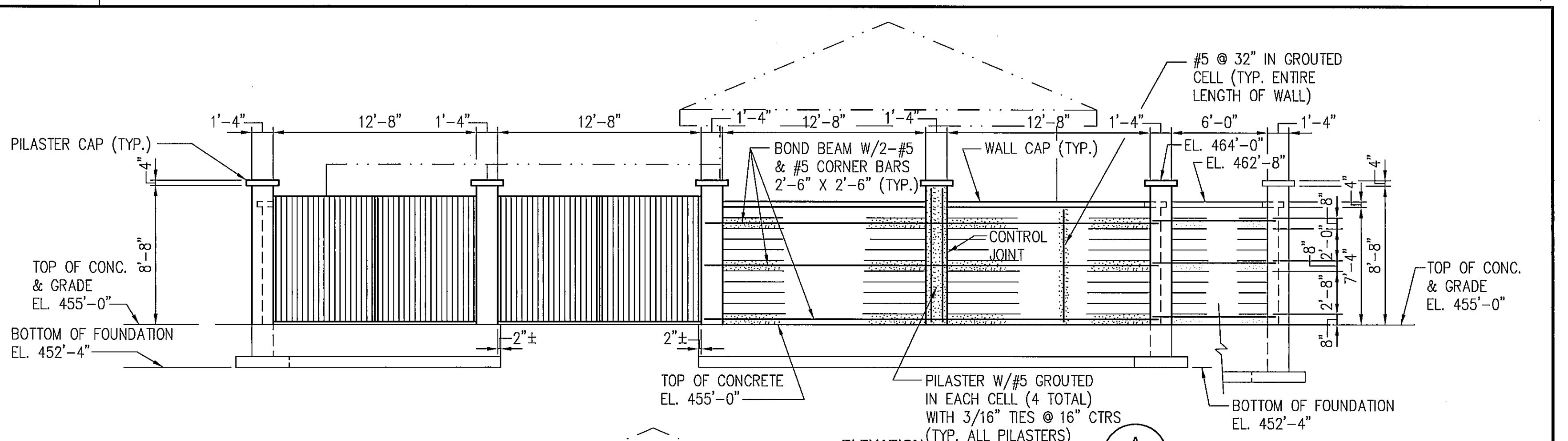
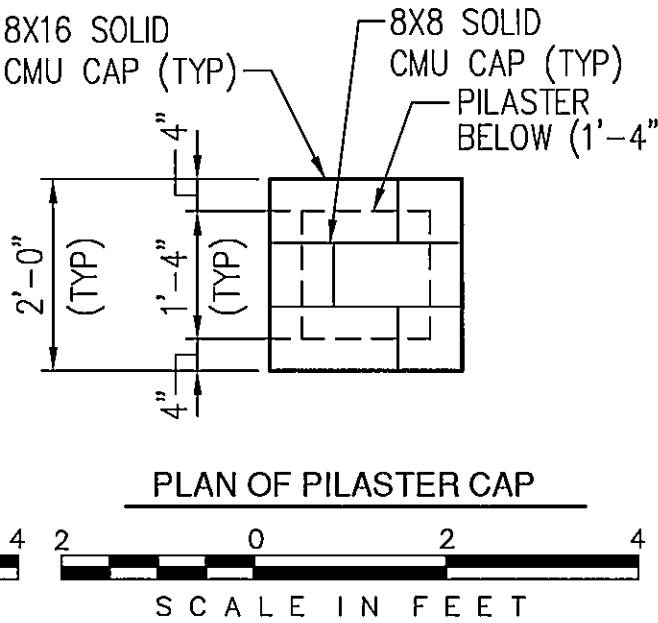
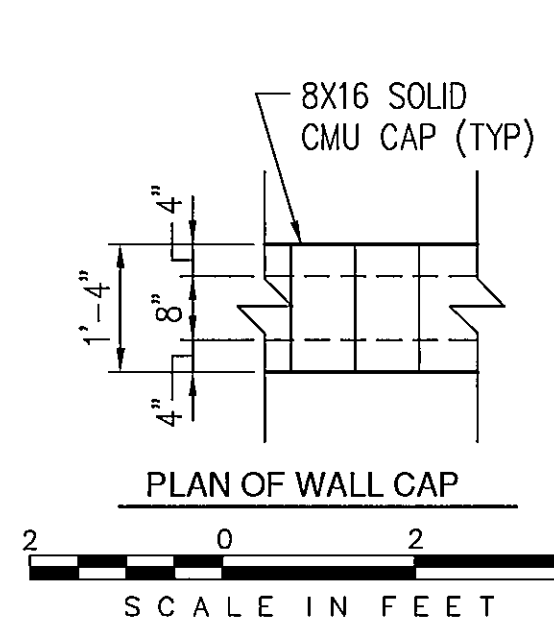
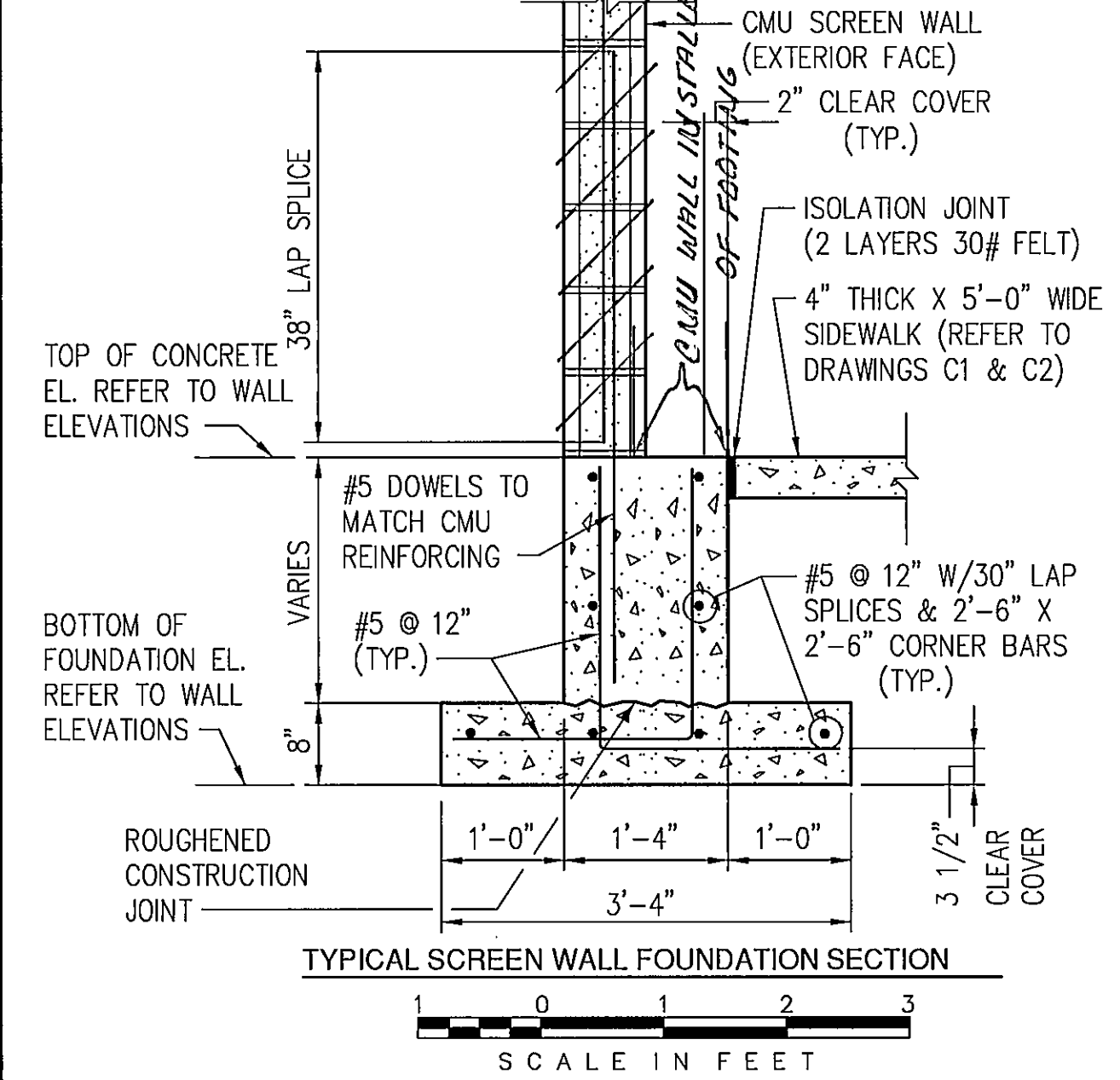
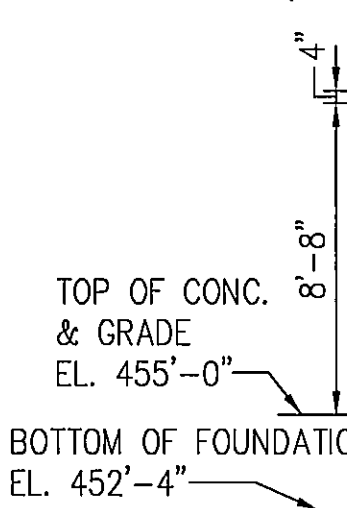
- CMU SCREEN WALL NOTES:**
1. CONCRETE MASONRY (ASSEMBLY) DESIGN STRENGTH:  $f'_m = 1500$  psi (BASED ON NET AREA).
  2. NORMAL WEIGHT BLOCKS WITH MINIMUM NET-AREA UNIT COMPRESSIVE STRENGTH = 1900 psi (TYPE I MOISTURE CONTROLLED).
  3. TYPE S MORTAR WITH AVERAGE COMPRESSIVE STRENGTH @ 28 DAYS = 1800 psi.
  4. MINIMUM GROUT STRENGTH = 2000 psi @ 28 DAYS.
  5. REINFORCING CONFORM TO ASTM A615: GRADE 60.
  6. JOINT REINFORCING: GALV. CARBON STEEL WIRE - LADDER TYP.
  7. HORIZONTAL REINFORCING:
    - a. BOND BEAMS: 2-#5, LOCATIONS AS INDICATED.
    - b. HORIZONTAL JOINTS: 3/16" Ø CROSS & SIDE RODS @ 16" CTRS.
  8. VERTICAL REINFORCING:
    - a. #5 @ MAXIMUM SPACING OF 32".
  9. REFER TO DRAWING C2 FOR SCREEN WALL LOCATION.
  10. REFER TO DRAWING C2 FOR ADDITIONAL SLAB FOUNDATIONS FOR EMERGENCY GENERATOR, TRANSFORMER, WALK-IN MCC STRUCTURE, AND AIR CONDITIONING UNIT.
  11. PILASTER CAP AND WALL CAP COLOR TO BE "LIGHT COCO".
  12. SCREEN WALL AND PILASTER COLOR TO BE "TAN".
  13. MORTAR TO BE TINTED TO MATCH "TAN" CMU COLOR OF WALL UNITS.



TYPICAL CONCRETE CONSTRUCTION JOINT

KEYWAY DETAIL

NOT TO SCALE



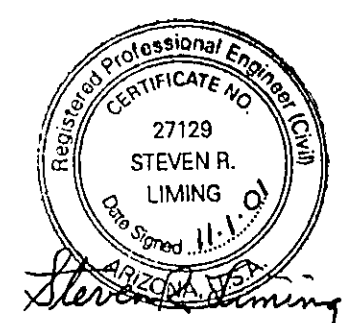
no.	date	by	revision
1	8-15-01	JDF	REVISED WALL LOCATION
2	8-15-01	JDF	AS-BUILT



date FEBRUARY 3, 2000  
 detailed J. HASENOEHL  
 designed L. BUCK/S. BECHER  
 checked B.B. / D.L.S.

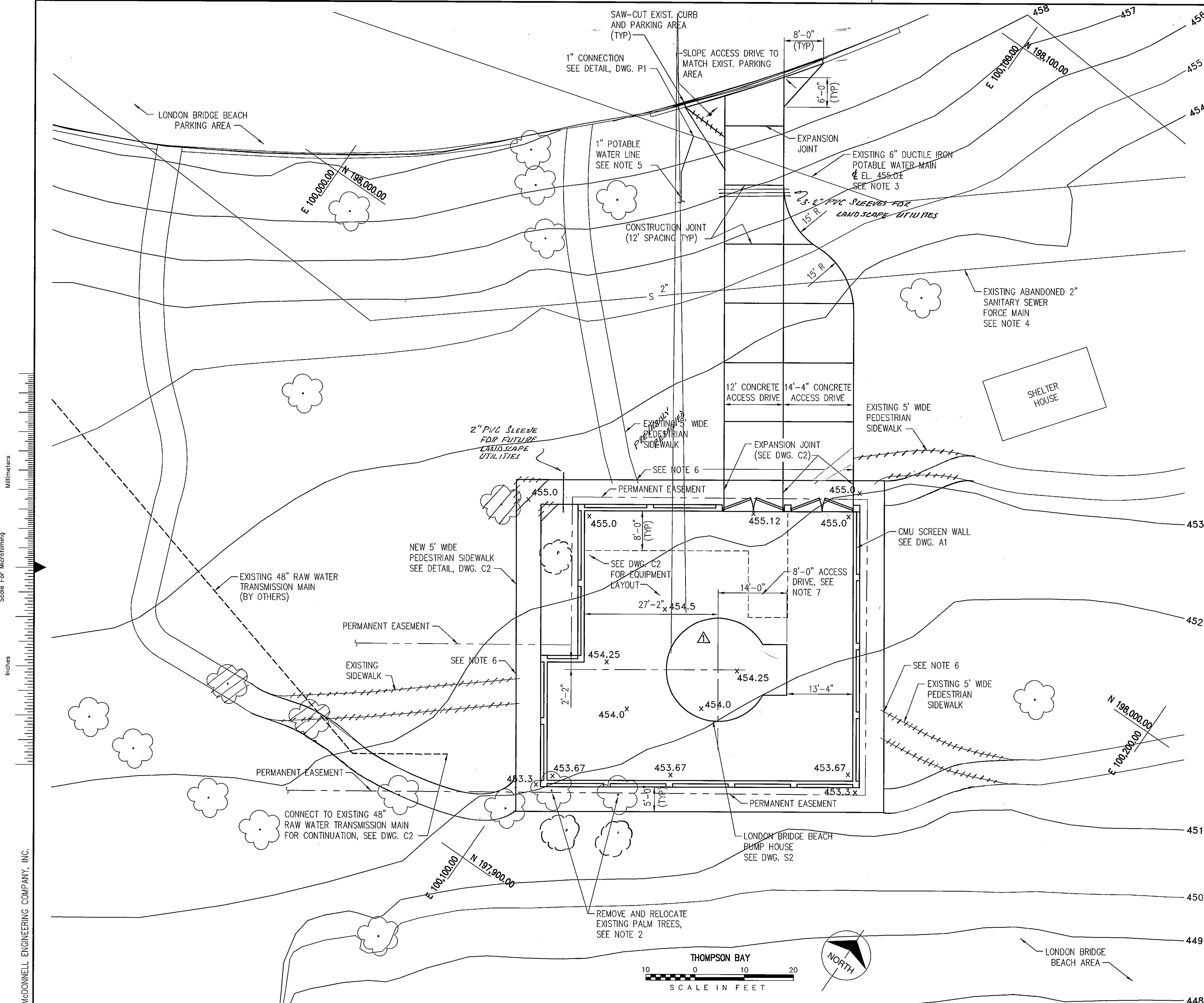


LONDON BRIDGE BEACH PUMP HOUSE  
 SCREEN WALL  
 PLAN, ELEVATIONS AND DETAILS  
 project 97-777-1-002 contract W-183-00  
 drawing A1 rev. 1  
 sheet 4 of 21 sheets  
 file



"AS-BUILT"

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**GENERAL NOTES:**

- ALL EXISTING UTILITY LOCATIONS ARE APPROXIMATE. CONTRACTOR SHALL VERIFY THE ACTUAL LOCATION OF ALL UTILITIES WITH THEIR RESPECTIVE OWNERS AS REQUIRED PRIOR TO BEGINNING WORK TO PREVENT DAMAGE BY CONTRACTOR'S OPERATION.
- IN ACCORDANCE WITH ARIZONA ADMINISTRATIVE CODE, SUPP. 99-2, SECTION R18-4-502, SUBSECTION 1, C.1., EXTRA PROTECTION CONSISTING OF MINIMUM OF 6" CONCRETE ENCASMENT SHALL BE PROVIDED FOR BOTH GRAVITY SEWER LINES AND THE 48-INCH RAW WATER LINE OR ANY OTHER POTABLE WATER LINES INSTALLED UNDER THIS CONTRACT WHERE A MINIMUM OF 2- FEET VERTICAL SEPARATION AND 6- FEET HORIZONTAL SEPARATION CAN NOT BE MAINTAINED BETWEEN THE TWO LINES. ENCASMENT SHALL EXTEND AT LEAST 10- FEET BEYOND THE AREA COVERED BY THIS SUBSECTION. IN ACCORDANCE WITH A.A.C., SUPP. 99-2, SECTION R18-4-502, SUBSECTION C.3., WHERE A SEWER FORCE MAIN CROSSES ABOVE OR LESS THAN 6- FEET BELOW THE 48- INCH WATER LINE, OR ANY OTHER POTABLE WATER LIES INSTALLED UNDER THIS CONTRACT, THE SEWER FORCE MAIN SHALL BE ENCASED IN A MINIMUM OF 6- INCHES OF CONCRETE FOR 10- FEET EITHER SIDE OF THE WATER MAIN.
- ALL ELEVATIONS ARE LAKE HAVASU CITY DATUM.
- CONTRACTOR SHALL LIMIT HIS WORK AREA TO PERMANENT EASEMENTS AND TEMPORARY EASEMENTS AS SHOWN FOR CONSTRUCTION OF WATER MAIN. NO ADDITIONAL TEMPORARY CONSTRUCTION EASEMENT EXISTS UNLESS OTHERWISE NOTED.
- CONTRACTOR SHALL TAKE ALL APPROPRIATE STEPS TO MAINTAIN CONTINUAL SERVICE OF UTILITIES. CONTRACTOR SHALL PROVIDE SUPPORT AND PROTECTION OF ALL UTILITY LINES TO PREVENT UNDERMINING OR DAMAGING OF THE UTILITY LINES DURING CONSTRUCTION. METHOD OF CROSSING AND/OR SUPPORT OF UTILITIES SHALL BE APPROVED BY UTILITY OWNER. SUPPORT OF UTILITY LINES, POWER POLES, FENCES, HIGHWAY SIGNS OR OTHER UTILITY SIGNS SHALL BE CONSIDERED AS SUBSIDIARY TO PIPELINE INSTALLATION.
- CONTRACTOR SHALL IMPROVE ACCESS AS REQUIRED TO FACILITATE HIS OPERATIONS AT NO ADDITIONAL COST TO THE OWNER.
- CONTRACTOR SHALL GRADE AND SURFACE AS SPECIFIED ALL AREAS DISTURBED BY CONSTRUCTION UNLESS INDICATED OR SPECIFIED OTHERWISE.
- CONTRACTOR SHALL PROVIDE CONTINUOUS PROTECTION AGAINST ENTRANCE OF FLOOD WATER INTO THE ENDS OF ALL BORINGS, BORE PITS AND INSTALLED PIPE.
- REMOVE FENCE, SIDEWALKS, ASPHALT AND CONCRETE ROADS AND DRIVEWAYS, DRIVEWAYS, CURB AND GUTTER, ROCK RIP RAP, CMP'S AND ASSOCIATED APPURTENANCES AS REQUIRED FOR CONSTRUCTION PURPOSES. RESTORE ALL REMOVED OR DAMAGED ITEMS TO CONDITION EQUAL TO OR BETTER THAN CONDITION BEFORE START OF WORK.
- CONTRACTOR SHALL TAKE APPROPRIATE STEPS TO PREVENT EROSION OF EARTHWORK AND DEPOSITION OF SEDIMENTS INTO WATER COURSES OR DRAINAGE SWALES.
- MAPPING AND GPS SERVICES PERFORMED BY:  
NORTHWEST SURVEYING, INC.  
53 MULBERRY AVENUE  
LAKE HAVASU CITY, AZ 86403  
DATED: OCTOBER, 1997  
PROJECT NO. PW-113-96  
ORIGINAL DOCUMENT BOOK ON FILE AT THE LAKE HAVASU CITY CITY ENGINEER'S OFFICE.
- AERIAL PHOTOGRAPHY PERFORMED BY:  
COOPER AERIAL SURVEYING CO.  
1692 W. GRANT ROAD  
TUCSON, AZ 85745

**DRAWING C1 NOTES:**

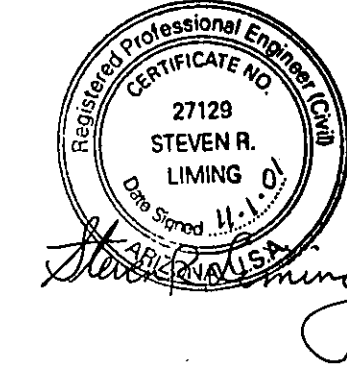
- THE LOCATION OF ALL TREES, PEDESTRIAN SIDEWALKS AND OTHER LANDSCAPE FEATURES ARE APPROXIMATE. CONTRACTOR SHALL FIELD VERIFY THE LOCATION OF ALL EXISTING LANDSCAPE ITEMS PRIOR TO PROCEEDING WITH THE WORK.
- EXCEPT AS NOTED, ALL TREES ARE DESIGNATED TO REMAIN. SHOULD THE NATURE OF THE WORK REQUIRE TREE REMOVAL OR RELOCATION, CONTACT FIELD REPRESENTATIVE PRIOR TO REMOVAL/RELOCATION OF SAID TREE.
- THIS DRAWING GENERAL NOTE NO. 8.
- EXISTING ABANDONED 2" SANITARY SEWER FORCE MAIN WITH CENTERLINE ELEVATION 454.5± HAS BEEN RELOCATED BY OWNER. CONTRACTOR SHALL FIELD VERIFY LOCATION OF 2" SANITARY SEWER FORCE MAIN PRIOR TO PROCEEDING WITH THE WORK.
- FIELD ROUTE 1" POTABLE WATER LINE FROM 6" WATER MAIN TO LOCATION INDICATED ON DRAWING C2. PROVIDE 2" SANITARY CROSSING (IF REQUIRED) IN ACCORDANCE WITH NOTES 3 AND 8 ON DRAWING P1.
- TIE NEW 5'-0" PERIMETER PEDESTRIAN SIDEWALK INTO THE EXISTING SIDEWALK AT NEAREST JOINT OF EXISTING SIDEWALK. SEE DETAIL, DWG C2.
- MAINTAIN 8'-0" WIDE CLEARANCE FOR ACCESS TO BASE OF CONCRETE PAD FOR MCC WALK-IN STRUCTURE AS SHOWN ON DRAWING C2.
- FOR SAKE OF CLARITY, PIPING, EQUIPMENT AND HORIZONTAL COLLECTOR WELL LATERALS ARE NOT SHOWN.
- CONTRACTOR SHALL FINISH GRADE AREAS DISTURBED DURING CONSTRUCTION. LAKE HAVASU CITY PARK DEPARTMENT WILL COMPLETE LANDSCAPING AFTER CONTRACTOR COMPLETES CONSTRUCTION.

**LEGEND**

- 450 EXISTING CONTOUR
- EXISTING TREE
- 453.67 FINISHED GRADE

**"AS-BUILT"**

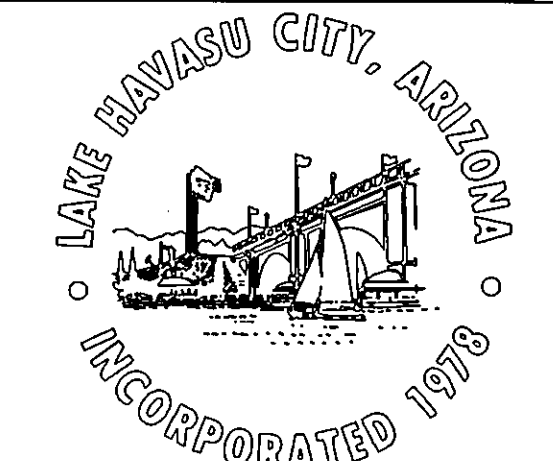
CALL TWO WORKING DAYS BEFORE YOU DIG  
**1-800-STAKE-IT**  
1-800-782-5348  
(OUTSIDE MARICOPA COUNTY)



no.	date	by	revision
△	7-27-01	JJM	(6-G) REVISE DRAWING TO ACCOMMODATE COLLECTOR WELL "AS BUILT"
	8-15-01	JDF	As-Built



date DEC. 7, 1999 detailed G. PORTER  
designed T. CROWLEY checked JLS



LONDON BRIDGE BEACH PUMP HOUSE  
SITE PLAN AND DETAILS  
project 97-777-1-002 contract W-183-00  
drawing **C1** rev. **1**  
sheet 2 of 21 sheets  
file Lbbphc01.dwg 06-14-2000 08:53 LJM

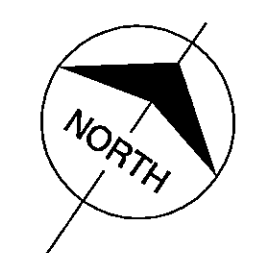
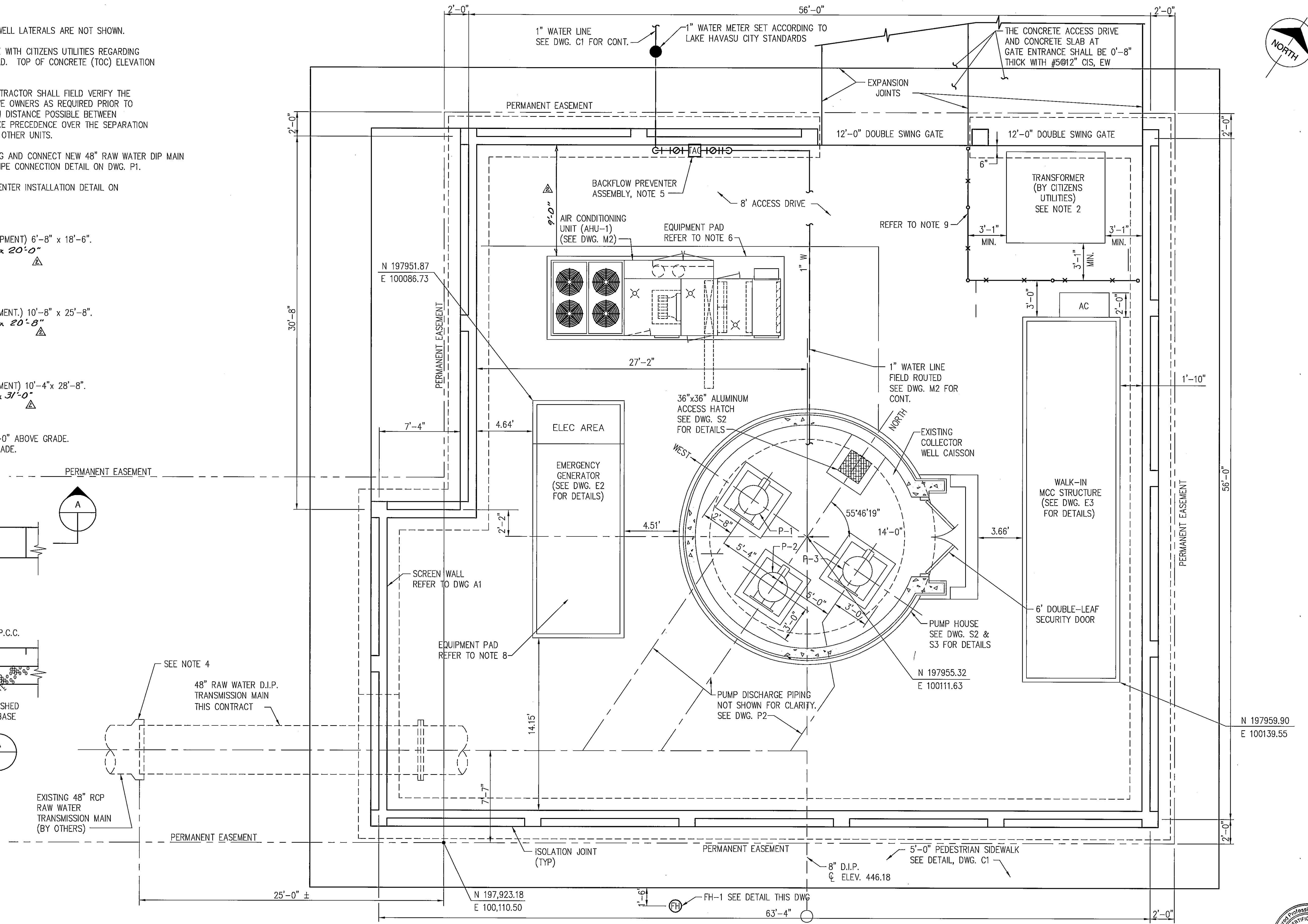
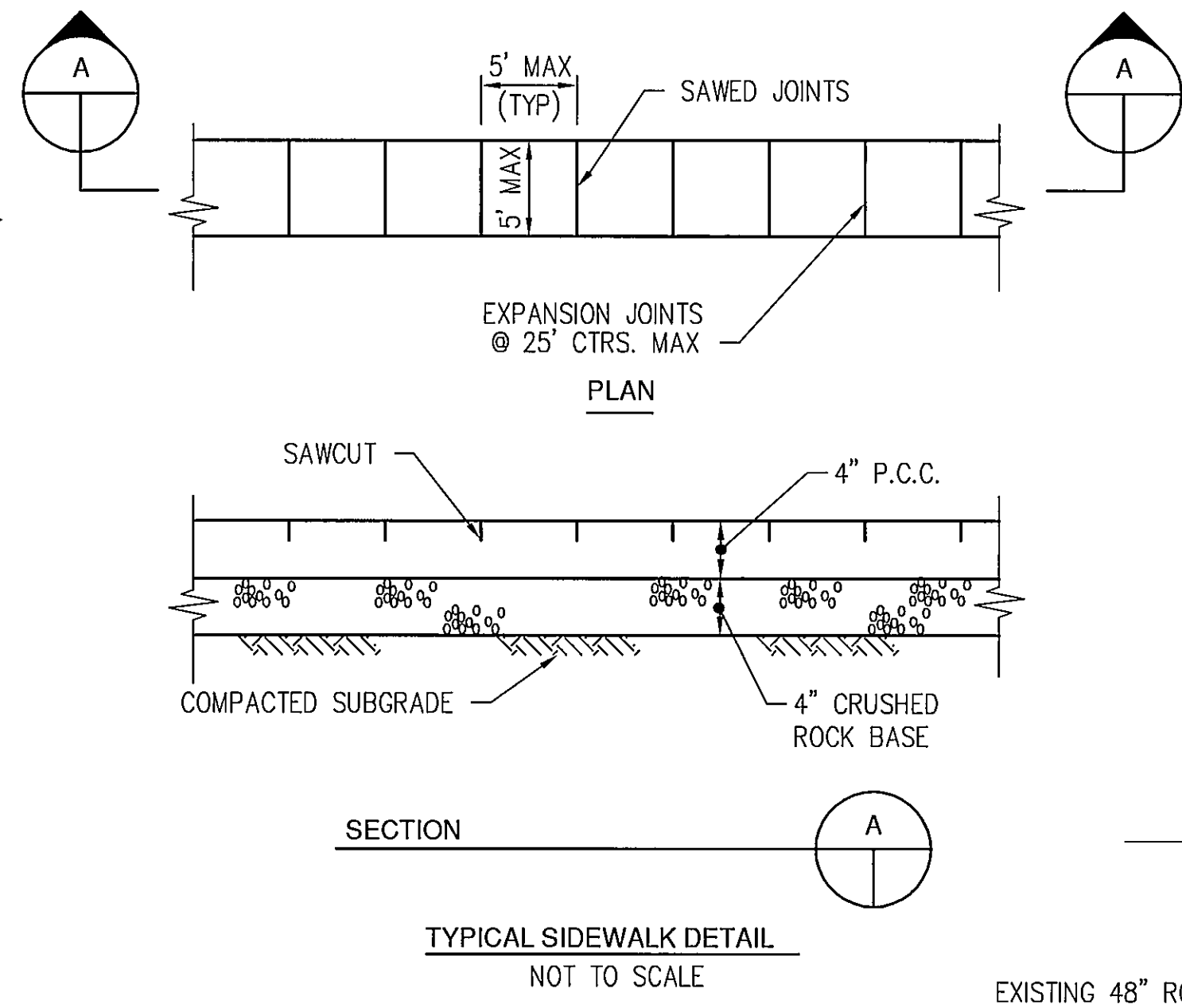
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Scale For Microfilming  
Millimeters  
Inches

NOTES:

- FOR SAKE OF CLARITY EXISTING HORIZONTAL COLLECTOR WELL LATERALS ARE NOT SHOWN.
- PROVIDE CONCRETE PAD FOR TRANSFORMER. COORDINATE WITH CITIZENS UTILITIES REGARDING REQUIRED THICKNESS AND DIMENSIONS FOR EQUIPMENT PAD. TOP OF CONCRETE (TOC) ELEVATION SHALL BE 454.75.
- ALL EXISTING UTILITY LOCATIONS ARE APPROXIMATE. CONTRACTOR SHALL FIELD VERIFY THE ACTUAL LOCATION OF ALL UTILITIES WITH THEIR RESPECTIVE OWNERS AS REQUIRED PRIOR TO BEGINNING WORK. MAINTAINING THE MAXIMUM SEPARATION DISTANCE POSSIBLE BETWEEN SEWER LINES AND THE PROPOSED WATER MAIN SHALL TAKE PRECEDENCE OVER THE SEPARATION DISTANCE BETWEEN THE PROPOSED WATER MAIN AND ALL OTHER UNITS.
- REMOVE EXISTING 48" HARNESS MECHANICAL JOINT PLUG AND CONNECT NEW 48" RAW WATER DIP MAIN FROM HORIZONTAL COLLECTOR WELL AS SHOWN ON THE PIPE CONNECTION DETAIL ON DWG. P1.
- SEE WATER SUPPLY AT METER LOCATION BACKFLOW PREVENTER INSTALLATION DETAIL ON DWG. M3.
- AIR CONDITIONING UNIT FOUNDATION SLAB:
  - TOP OF CONCRETE ELEVATION 455'-0"
  - PLAN DIMENSIONS (CONTRACTOR TO VERIFY WITH EQUIPMENT) 6'-8" x 18'-6"
  - SLAB THICKNESS 1'-0". **DIMENSION: 9'-0" x 20'-0"**
  - REINFORCING:
    - #4@10" EW, TOP W/2" CLEAR COVER.
    - #4@10" EW, BOTTOM W/3" CLEAR COVER.
- EMERGENCY GENERATOR FOUNDATION SLAB:
  - TOP OF CONCRETE ELEVATION 455'-0"
  - PLAN DIMENSIONS (CONTRACTOR TO VERIFY W/ EQUIPMENT.) 10'-8" x 25'-8"
  - SLAB THICKNESS 1'-3". **DIMENSION: 8'-0" x 20'-8"**
  - REINFORCING:
    - #5@12" EW, TOP W/ 2" CLEAR COVER.
    - #5@12" EW, BOTTOM W/ 3" CLEAR COVER.
- WALK-IN MCC STRUCTURE FOUNDATION SLAB:
  - TOP OF CONCRETE ELEVATION 454'-0". **452'-4"**
  - PLAN DIMENSIONS (CONTRACTOR TO VERIFY W/ EQUIPMENT) 10'-4" x 28'-8"
  - SLAB THICKNESS 1'-0". **DIMENSION: 10'-2" x 31'-0"**
  - REINFORCING:
    - #4@10" EW, TOP W/ 2" CLEAR COVER.
    - #4@10" EW, BOTTOM W/3" CLEAR COVER.
- PROVIDE CHAIN LINK FENCE. TOP OF FABRIC SHALL BE 7'-0" ABOVE GRADE. TOP OF POSTS SHALL BE MAX. HEIGHT OF 7'-4" ABOVE GRADE.

Scale For Microfilming  
Inches  
Millimeters



“AS-BUILT”

CALL TWO WORKING DAYS BEFORE YOU DIG  
1-800-STAKE-IT  
1-800-782-5348  
(OUTSIDE MARICOPA COUNTY)



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no.	date	by	revision
1	1-9-01	JJM	(A1-G12) REVISE DRAWING TO ACCOMMODATE COLLECTOR WELL "AS BUILT" CONDITION
2	8-15-01	JDF	ADDED AS-BUILT DIMENSIONS
3	8-15-01	JDF	AS-BUILT



date JAN. 9, 2001  
designed J. MASCHE  
detailed D.DOMBROSKI  
checked J.L.S./J.J.M.



LONDON BRIDGE BEACH PUMP HOUSE	
EQUIPMENT LAYOUT	
project 97-777-1-002	contract W-183-00
drawing <b>C2</b>	rev. <b>#2</b>
sheet of sheets	file Lbbphc02.dwg 06-14-2000 13:32 LJM

ONE-LINE DIAGRAMS

Table with 3 columns: Symbol, Description, and Code. Includes symbols for power circuit, equipment enclosure, control circuit, connection, cable stress cone, air circuit breaker, fuse, fused disconnect switch, plug-in or drawout connection, disconnect switch, fused control power transformer, power transformer (XFMR), current transformer (2 required), potential transformer (2 required), lightning or surge arrester, ground connection, motor circuit protector, solid state single speed non-reversing motor starter, combination air circuit breaker, and one-line diagram solid state motor controller.

SCHEMATIC DIAGRAM DEVICE DESIGNATIONS

Table with 3 columns: Designation, Description, and Notes. Includes categories like AUTOMATIC (A, CL, HT, H, LCL, L, HR, HS, LS, NC, NO, RMT, OP, INST, FWD, REV, ACK), CURRENT TO CURRENT TRANSDUCER (I/I, LS, LLS, M, MT, MV/I, MX, OL, PB, PS, SOL, SV, SR, SS, ST, SPB, XFMR, T, TR, TS, VS, TMR, ETM, EP, FD), and DEVICE DESIGNATIONS (AL, ANN, CB, CNTOR, CR, CS, CT, ES, F/I, F/MV, FSR, FST, FLS, FS, FU, IL, IPB, ISS, I/F).

INSTRUMENTATION

Table with 3 columns: Symbol, Description, and Code. Includes measuring instrument, dual function instrument, ultrasonic transducer, pressure transducer, differential producing flow tube, ultrasonic flow meter, field mounted instrument, instrument mounted behind panel face, instrument mounted on panel face, flow meter, analog input to PLC, analog output from PLC, digital input to PLC, and digital output from PLC.

PLANS

Table with 3 columns: Symbol, Description, and Code. Includes symbols for new/existing construction, conduit, flexible conduit, ground cable, ground cable riser, bolted/welded ground connection, ground rod, home run to panels, conduit turning, power panel, lighting panel, disconnect switch, manual motor starter, and magnetic motor starter.

SCHEMATIC DRAWINGS

Table with 3 columns: Symbol, Description, and Code. Includes symbols for conductor connection, contact, selector switch, pushbutton, fuse, resistance or heating element, thermal overload relay, indicating light, normally open/closed time delay contact, normally open/closed time delay contact, and torque switch.

ABBREVIATIONS

Table with 2 columns: Abbreviation and Full Name. Includes AFG (Above Finished Grade), A.F.F. (Above Finished Floor), ATS (Automatic Transfer Switch), C (Conduit), WP (Weatherproof), EXP (Explosion-Proof), MCC (Motor Control Center), BC (Bare Copper Wire Type BC1), N.O. (Normally Open), N.C. (Normally Closed), SP (Spare), PLC (Programmable Logic Controller), EWC (Electric Water Cooler), N?C (Not in Contract), UE (Underground Electrical), HTR (Heater), and CHGR (Charger).

GENERAL NOTES: 1. INSTALL WIRE TYPE "SE2" FOR ALL SERVICE ENTRANCE CIRCUITS. 2. INSTALL WIRE TYPE "SEN1" FOR ALL POWER CIRCUITS. 3. INSTALL WIRE TYPE "CVV1" FOR ALL MULTICONDUCTOR CONTROL CIRCUITS. 4. INSTALL WIRE TYPE "BC2" FOR ALL BELOW GRADE GRADE CIRCUITS. 5. INSTALL WIRE TYPE "IVV1" FOR ALL INSTRUMENTATION CIRCUITS. NOTE: THIS IS A STANDARD ELECTRICAL LEGEND AND NOT ALL DEVICES AND DEVICE DESIGNATIONS ARE USED ON THIS PROJECT.

"AS-BUILT"



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Table with 4 columns: no., date, by, revision. Row 1: no. 8-15-01, date JDF, by AS-BUILT, revision.



Table with 2 columns: date, detailed, designed, checked. Row 1: date NOV. 12, 1999, detailed M. J. NEWTON, designed T. MOLL, checked E.L.T.

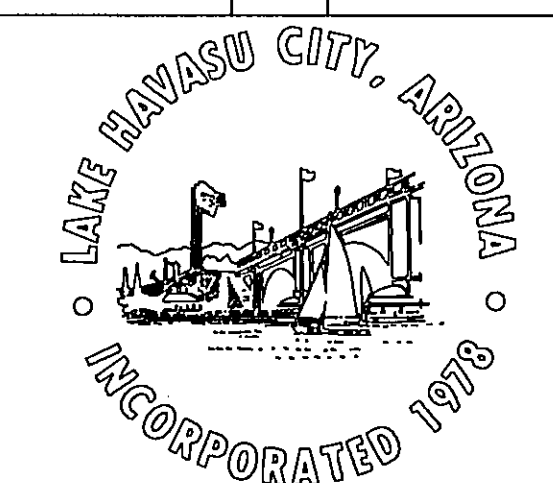
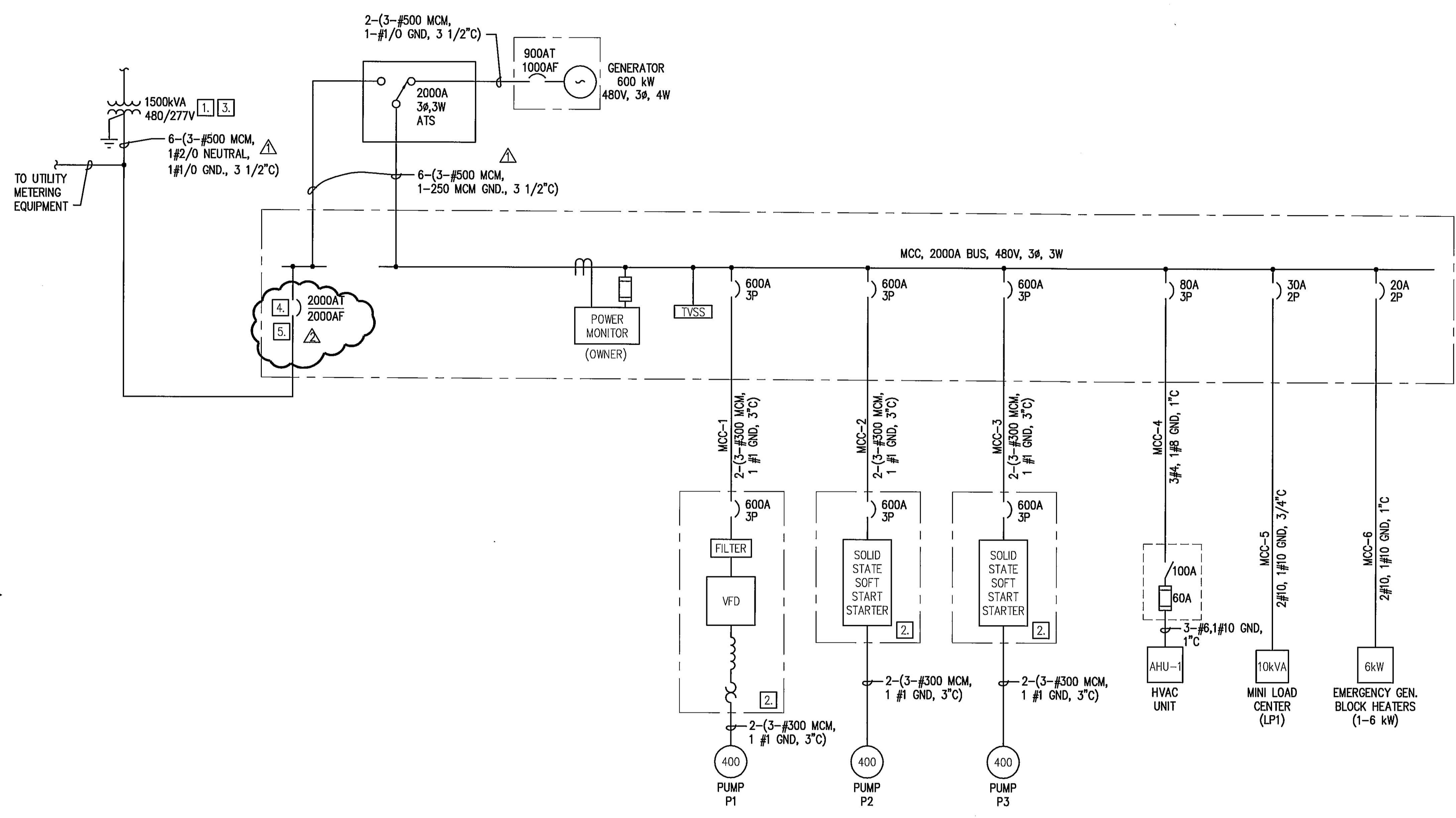


Table with 2 columns: project, contract, drawing, rev., sheet, of, sheets, file. Row 1: project 97-777-1-002, contract W-183-00, drawing E1, rev. -, sheet 15 of 21 sheets, file Lbbphe01.dwg 03-20-2000 15:40 JRR

- NOTES:
1. PROVIDE ALL TRENCHING AND BACKFILL FOR THE INSTALLATION OF THE PRIMARY SERVICE CABLE BY CITIZENS UTILITY COMPANY. THE TRENCHING AND BACKFILL SHALL MEET THE STANDARDS AND REQUIREMENTS OF CITIZENS UTILITY COMPANY.
  2. ALL PUMP CONTROLS SHALL BE INTERLOCKED SO THAT ONLY ONE PUMP CAN RUN WHEN ON EMERGENCY GENERATOR POWER. PROVIDE ONE 1°C FROM MOTOR TO CONTROLLER FOR CONTROL WIRING IN ADDITION TO POWER CONDUITS.
  3. INSTALL METERING PER CITIZENS UTILITY COMPANY STANDARDS AND RECOMMENDATIONS.
  4. MAIN BREAKER SHALL BE 100% RATED.
  5. BOND TRANSFORMER GROUND AND NEUTRAL TO GROUND AT MAIN CIRCUIT BREAKER.

MCC LOAD CALCULATIONS				
CIRCUIT DESCRIPTIONS	kW	KVA	HP	FLA
HVAC UNIT			50	65
MINI-LOAD CENTER		15		18
PUMP P1			400	477
PUMP P2			400	477
PUMP P3			400	477
BLOCK HEATER	6			8
SUBTOTAL:				1522
+ 25% OF LARGEST MOTOR:				119
TOTAL AMPS @ 480/3-PHASE:				1641
TOTAL CONNECTED KVA:				1365



ONE-LINE DIAGRAM

MINI LOAD CENTER LP1 240/120V VOLTS 1 PHASE 3 WIRE 50 AMP. M.C.B.										
10 kVA RATING 10,000 SYM. A.I.C. MIN. SURFACE MOUNTED										
POLE NO.	CIRCUIT NO.	TRIP AMPS	WIRE SIZE	LOAD SERVED	LOAD - VA φ A φ B	POLE NO.	CIRCUIT NO.	TRIP AMPS	WIRE SIZE	LOAD SERVED
1	LP1-1	20	12	RECEPTACLES	1080 900	2	LP1-2	20	12	BLDG LIGHTING
3	LP1-3	20	12	FAN EF-1 AND LOUVER	800 600	4	LP1-4	20	12	AREA LIGHTING
5	LP1-5	20	12	INSTRUMENTATION	500 50	6	LP1-6	20	12	LIT-1
7	LP1-7	20	12	SCADA SYSTEM	500 250	8	LP1-8	20	12	EMERG. GENERATOR BATT. CHARGER
9	-	-	-	SPARE		10	-	-	-	SPARE
TOTAL CONNECTED LOAD:					2530	3150				
23.5 AMPERES					5.6	KVA				

Scale For Microfilming  
Millimeters  
Inches

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no.	date	by	revision
1	12/7/00	TJM	(B-2) FEEDER FROM UTILITY TRANSFORMER TO MAIN SWITCH-ADDED NEUTRAL CONDUCTORS (B-4) INCREASED GROUND CONDUCTOR FROM #1/0 TO 250MCM
2	1/3/01	TJM	(C-3)(B-15) ADDED NOTE 5.
	8.15.01	JDF	As-BUILT



date NOV. 11, 1999  
designed T. MOLL  
detailed M. J. NEWTON  
checked E.L.T.

"AS-BUILT"

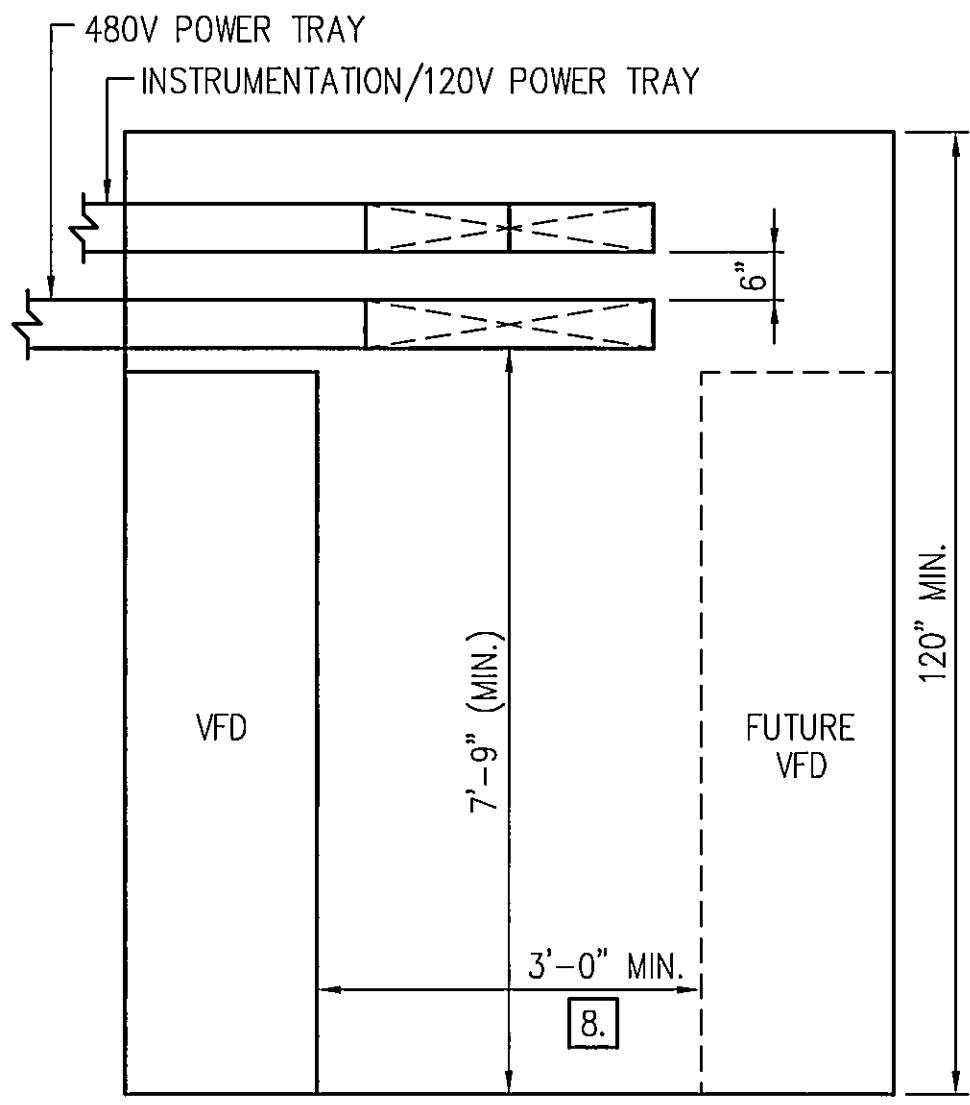


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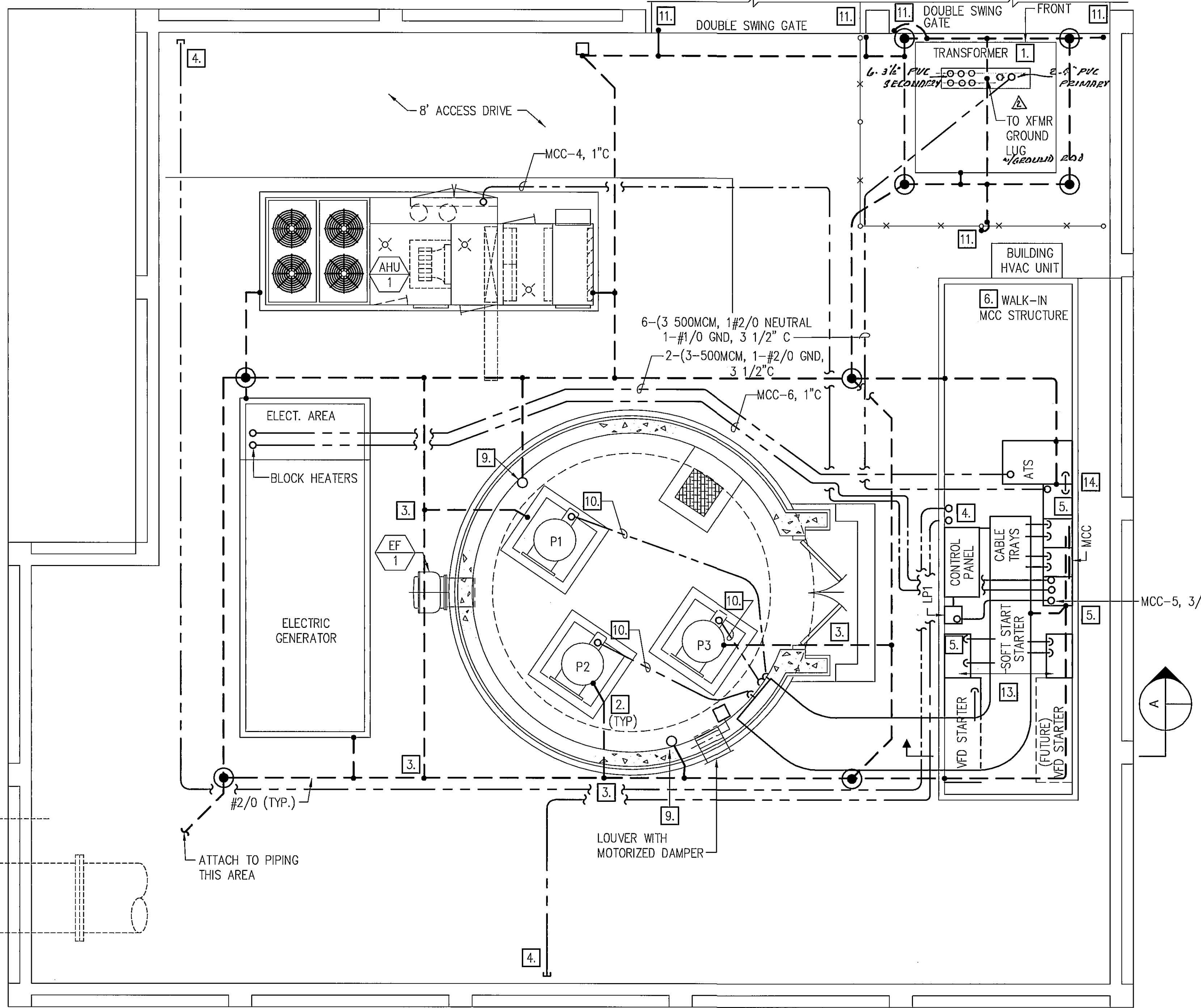


LONDON BRIDGE BEACH PUMP HOUSE  
ELECTRICAL ONE-LINE DIAGRAM  
project 97-777-1-002 contract W-183-00  
drawing E2 rev. 2  
sheet 16 of 21 sheets  
file lbbphe02.dwg 01-03-2001 15:00 DHD



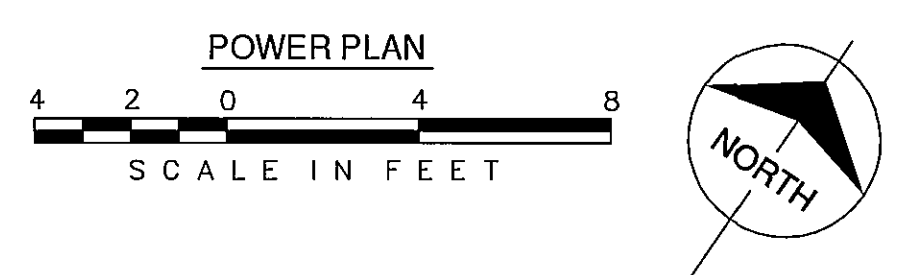


Millimeters  
 Scale For Microfilming  
 Inches



- NOTES:**
1. PROVIDE TRANSFORMER PAD PER CITIZENS UTILITY COMPANY STANDARDS AND RECOMMENDATIONS.
  2. CONTRACTOR TO COORDINATE LOCATION OF GROUNDING CONDUCTORS WITH ORIENTATION OF PUMP MOTOR TO PROVIDE MINIMUM EXPOSED LENGTH OF GROUNDING CONDUCTOR AND FACILITATE CONNECTION TO PUMP MOTOR.
  3. CONTRACTOR SHALL LEAVE FIVE FEET OF SLACK IN GROUNDING CONDUCTOR WHERE GROUNDING CONDUCTOR ENTERS PUMP HOUSE SLAB. SLACK IN GROUNDING CONDUCTOR TO ALLOW FOR SETTLING OF SOIL AROUND WELL.
  4. PROVIDE 1" CONDUIT FOR FUTURE SCADA SYSTEM ANTENNA. STUB UP 6" ABOVE GROUND, CAP BOTH ENDS AND MAKE WATERTIGHT.
  5. CONNECT GROUNDING CONDUCTORS TO MCC GROUND BUS.
  6. CONTRACTOR SHALL VERIFY SLAB DIMENSIONS, THICKNESS AND REINFORCING WITH EQUIPMENT MANUFACTURER.
  7. COORDINATE CONDUIT ENTRANCE INTO ALL EQUIPMENT WITH APPROPRIATE MANUFACTURER'S DRAWINGS SHOWING CONDUIT ACCESS.
  8. PROVIDE SPACE FOR N.E.C. REQUIREMENTS, BASED ON EQUIPMENT FURNISHED.
  9. PROVIDE MECHANICAL CONNECTION TO METAL ROOF SUPPORT FOR #2/0 BARE COPPER CONDUCTOR FROM GROUNDING SYSTEM. PROVIDE APPROX. FIVE FEET OF SLACK IN GROUNDING CONDUCTOR BETWEEN FINAL WALL SUPPORT AND ROOF CONNECTION. COIL CONDUCTOR INSIDE ROOF CAVITY. SEE STRUCTURAL DRAWING S3 FOR POINT OF CONNECTION.
  10. CONDUIT RUN DEPICTS ROUTING OF TWO POWER CONDUITS (3" C) AND ONE CONTROL CONDUIT (3/4" C) TO EACH PUMP MOTOR.
  11. BOLT GROUND CABLE TO GATE'S STEEL SUPPORT. PROVIDE GROUND STRAP BETWEEN STEEL SUPPORT AND GATE AS SPECIFIED.
  12. ALL POWER, LIGHTING, INSTRUMENTATION, ETC., TO UTILIZE CABLE TRAY TO RUN BACK TO ELECTRICAL BUILDING.
  13. PROVIDE SUPPORTS FOR CABLE TRAY AS REQUIRED BY NEC. PROVIDE #2 GROUND CONDUCTOR LENGTH OF TRAY, ATTACH TO EACH INDIVIDUAL SECTION WITH BOLTED CONNECTION.
  14. BOND UTILITY TRANSFORMER GROUND AND NEUTRAL TO GROUND AT MAIN SWITCH.

**SPECIAL NOTE TO CONTRACTOR:**  
 NO CONNECTIONS TO REMOVABLE ROOF ALLOWED EXCEPT AS NOTED FOR GROUNDING SYSTEM.



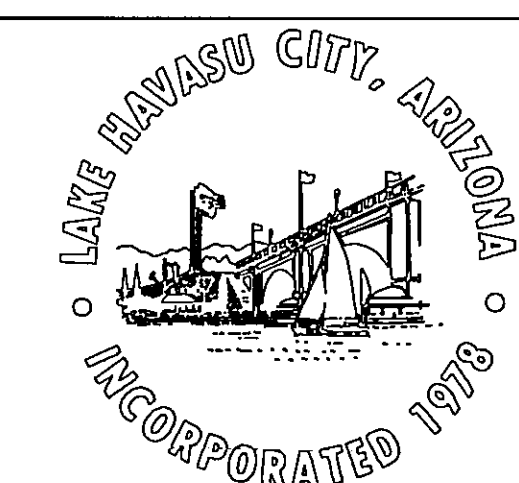
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no.	date	by	revision
1	1-3-01	TJM	(A1-G16) REVISE DRAWING TO ACCOMMODATE COLLECTOR WELL "AS BUILT" CONDITION
2	8-15-01	JDF	DETAILED TRANSFORMER
3	8-15-01	JDF	AS-BUILT

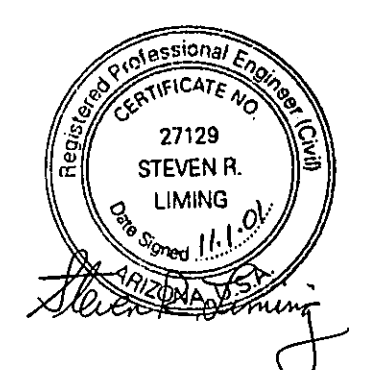


date DECEMBER, 26, 2000 detailed D.DOMBROSKI  
 designed T. MOLL checked E.L.T.

**"AS-BUILT"**

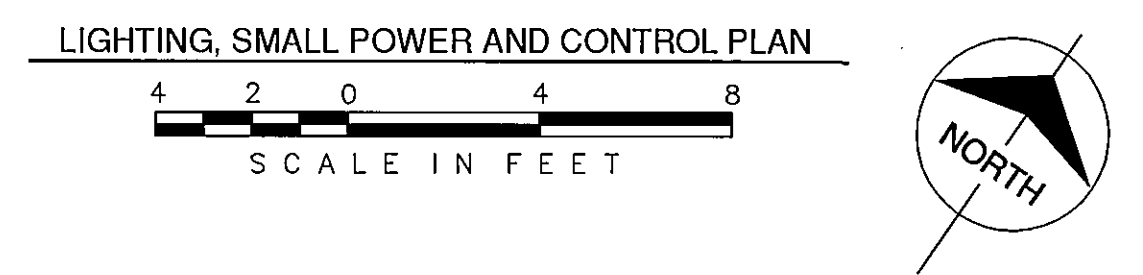
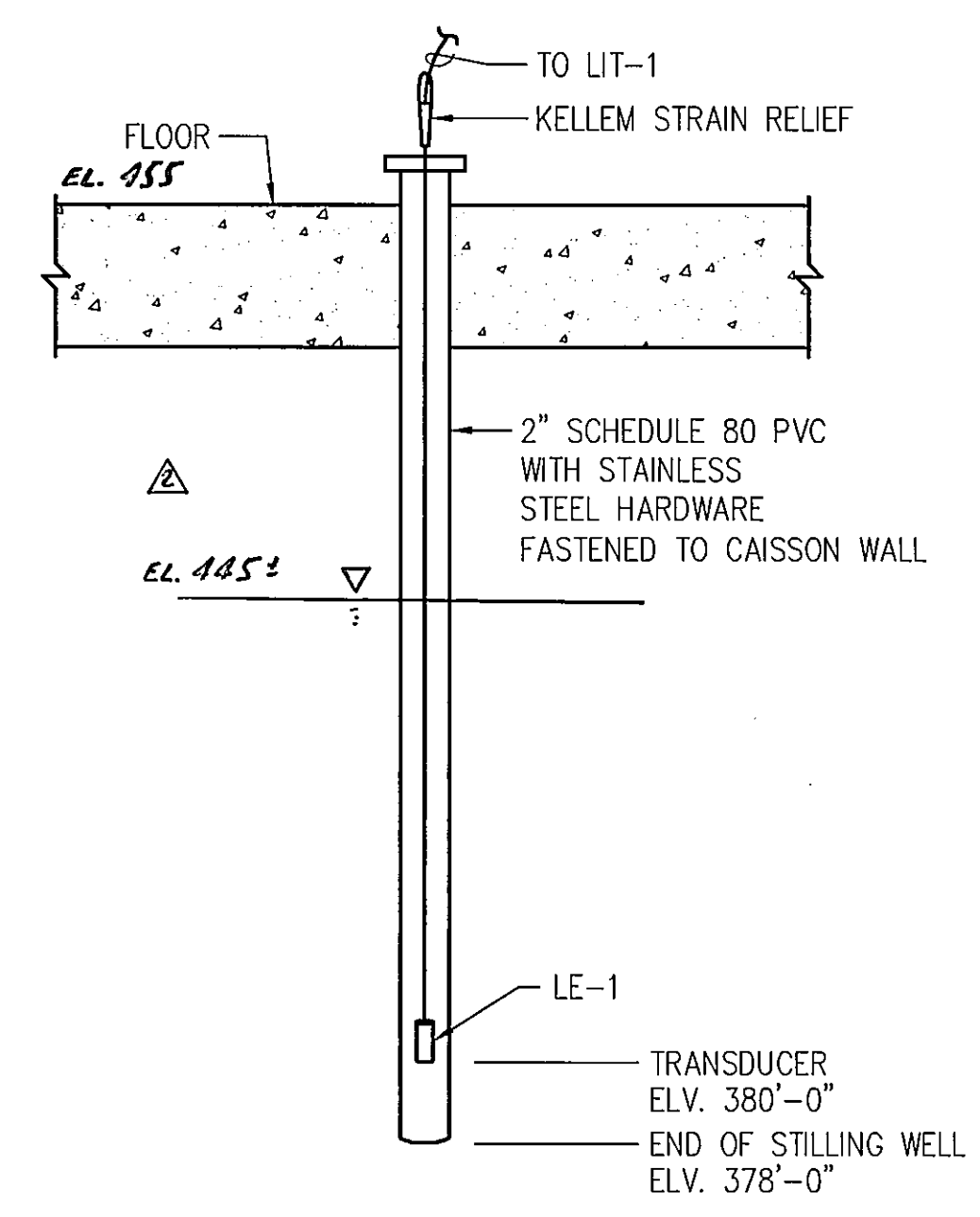
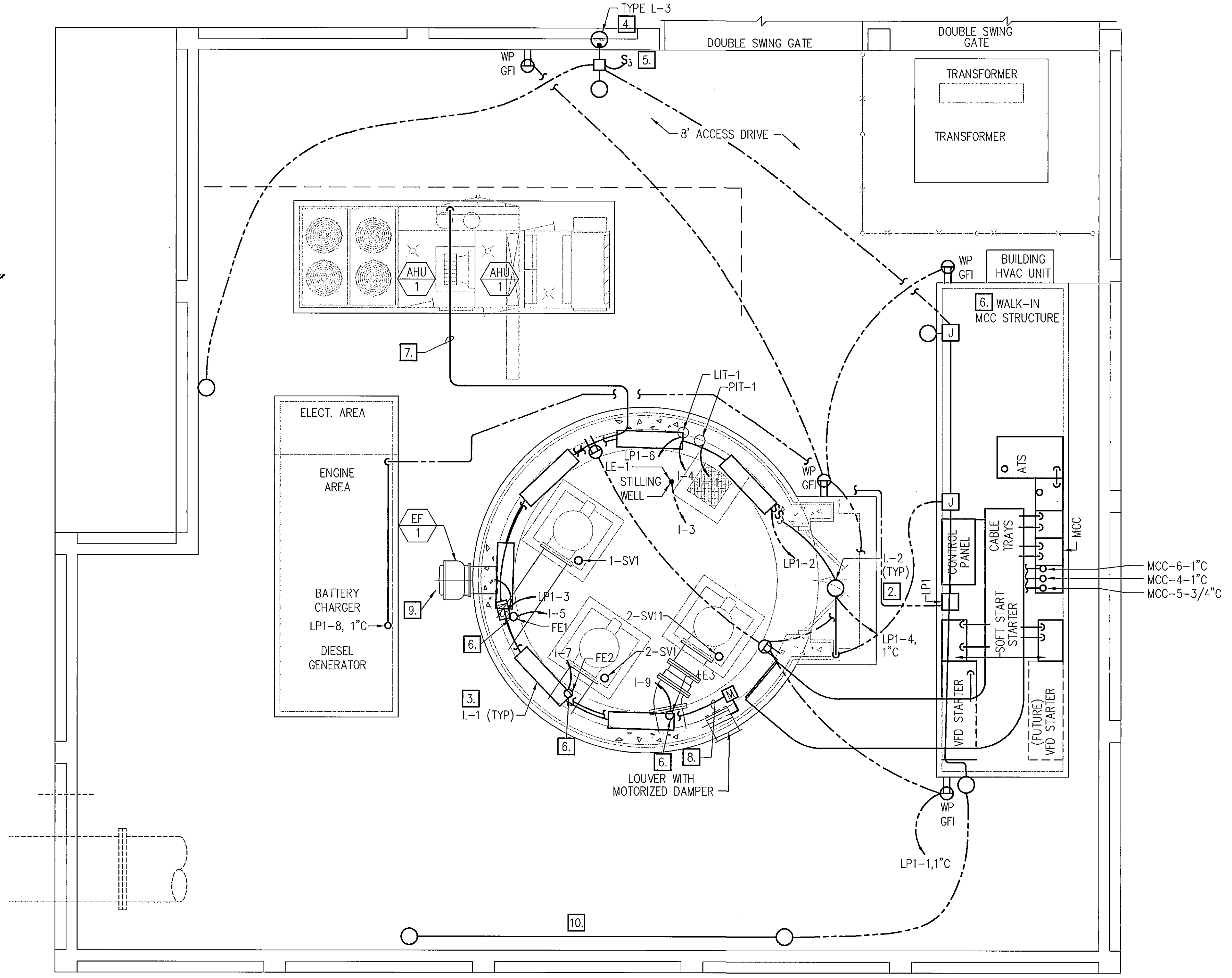
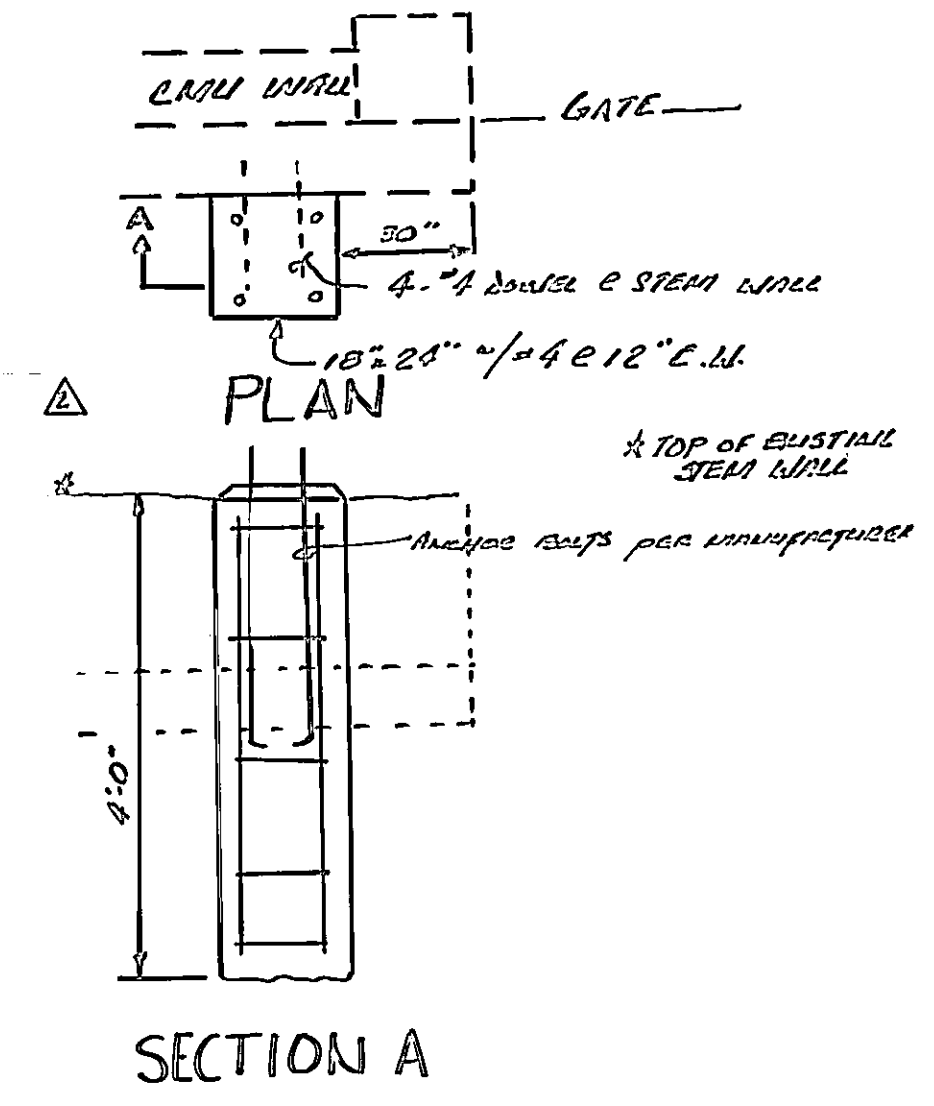


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LONDON BRIDGE BEACH PUMP HOUSE	
ELECTRICAL POWER PLAN	
project 97-777-1-002	contract W-183-00
drawing <b>E3</b>	rev. <b>#2</b>
sheet 17 of 21 sheets	file Lbbphe3A.dwg 01-02-2001 11:14 DHD

- NOTES:
1. MOUNT TOP OF LIGHT FIXTURE TYPE L-2 EVEN WITH TOP OF WALL.
  2. CENTER LIGHT FIXTURE TYPE L-2 ON PUMP HOUSE DOOR WIDTH AND BETWEEN TOP OF DOOR AND REMOVABLE ROOF.
  3. MOUNT LIGHT FIXTURE TYPE L-1 AT 7'-0" AFF INSIDE BUILDING. DO NOT MOUNT TO REMOVABLE ROOF.
  4. POLE MOUNTED FIXTURE L-3 TO BE EQUIPPED WITH PHOTOCELL, PHOTOCELL TO CONTROL BOTH LIGHT FIXTURES. LOCATE POLE AS CLOSE TO WALL POSSIBLE. *SEE POLE BASE DETAIL.*
  5. MOUNT SWITCHES INSIDE LOCKABLE BOX, SURFACE MOUNT TO WALL.
  6. REFER TO DWG. E7 FOR FLOW SENSOR DETAIL. REFER TO DWG. P2 FOR EXACT LOCATION OF FLOW SENSORS.
  7. CONTROL CABLE FOR INTERLOCK BETWEEN AHU-1 AND EF-1 SIZE CONDUIT AND CABLE PER MANUFACTURER'S RECOMMENDATIONS.
  8. CONTROL CABLE FOR MOTORIZED DAMPER 2 #12, #12 GND, 3/4"C.
  9. EXHAUST FAN EF-1 AND MOTORIZED DAMPER ARE INTERLOCKED SO THAT WHEN FAN EF-1 IS ENERGIZED THE MOTORIZED LOUVER IS OPEN. FAN EF-1 IS CONTROLLED BY AN INTERLOCK WITH AHU-1 WHEN AHU-1 IS OFF EF-1 IS ENERGIZED. THE LOUVER IS POWERED CLOSED, UPON LOSS OF POWER IT OPENS. SEE MECHANICAL DRAWINGS FOR WIRING DIAGRAM.
  10. RUN LIGHTING CONDUIT ALONG WALL AT SAME HEIGHT AS LIGHT FIXTURE.



Scale For Microfilming  
Millimeters  
Inches

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no.	date	by	revision
1	1-3-01	TJM	(A1-G12) REVISE DRAWING TO ACCOMMODATE COLLECTOR WELL "AS BUILT" CONDITION
2	8-15-01	JDF	ADDED ELEV AT STILLING WELL & ADDED LIGHT POLE DETAIL.
3	8-15-01	JDF	AS-BUILT

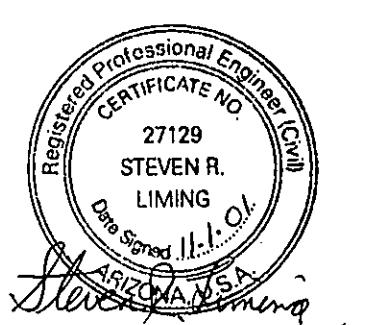


date DECEMBER 27, 2000  
designed T. MOLL  
detailed D. DOMBROSKI  
checked E.L.T.

"AS-BUILT"

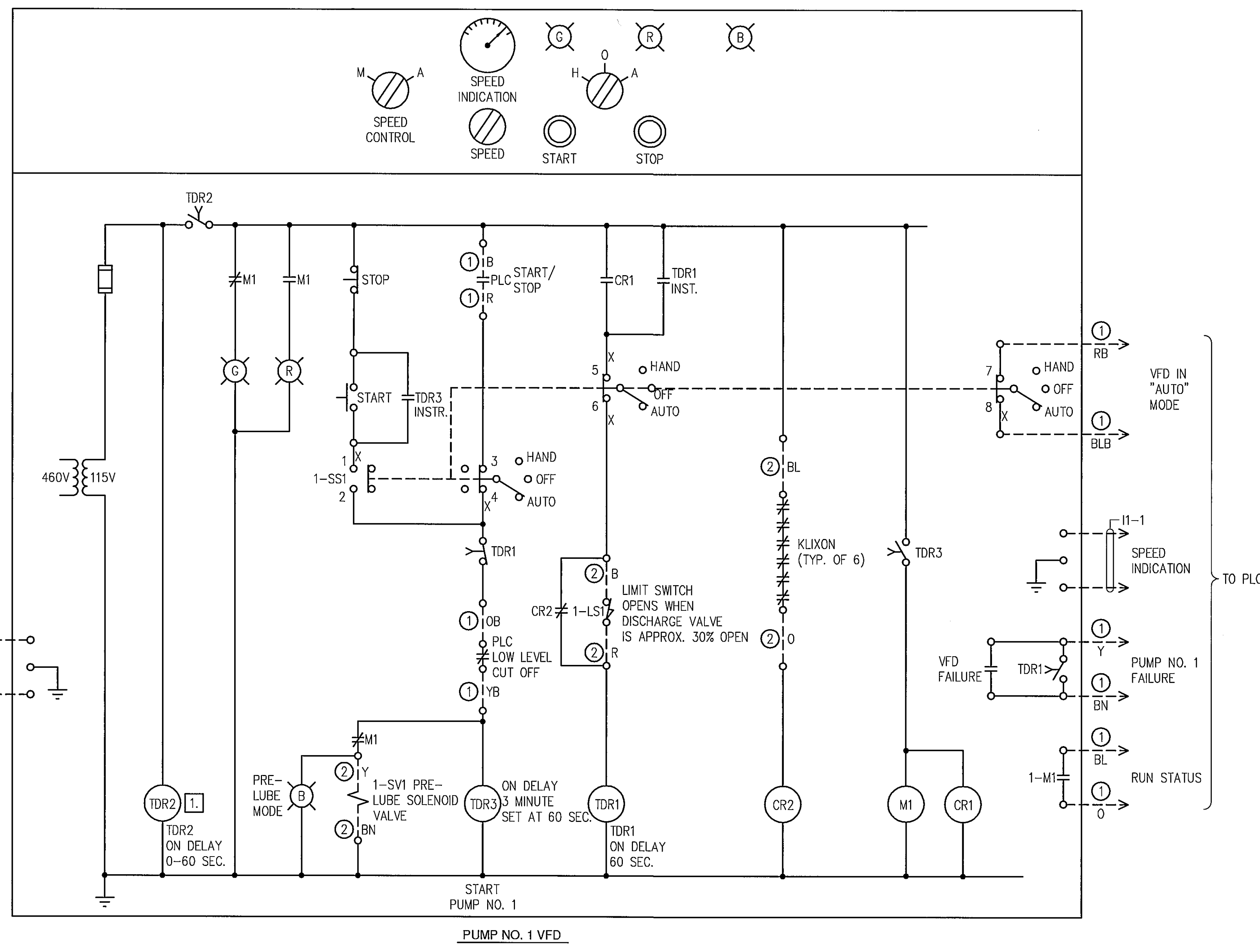


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LONDON BRIDGE BEACH PUMP HOUSE  
ELECTRICAL LIGHTING, SMALL POWER AND CONTROL PAN  
project 97-777-1-002 contract W-183-00  
drawing E4 rev. 12  
sheet 18 of 21 sheets  
file Lbbphe4A.dwg 01-02-2001 10:46 DHD

Scale For Micrometers  
Inches



**DESCRIPTION OF OPERATION**  
**PUMP CONTROL**  
 THE PUMP VFD SHALL HAVE A H-O-A SWITCH WITH CONTROLS AS FOLLOWS:  
 HAND - THE PUMP SHALL BE STARTED/STOPPED FROM THE VFD.  
 OFF - THE PUMP IS OFF.  
 AUTO - THE PUMP SHALL BE CONTROLLED BY THE PLC.  
 IF THE LEVEL FALLS TO 390'-0", THE PLC SHALL INITIATE A BACKUP, LOW LEVEL CUTOFF COMMAND TO ALL PUMPS.  
 IF THE DISCHARGE VALVE FAILS TO OPEN OR HIGH MOTOR TEMPERATURE AFTER THE PUMP STARTS, TDR1 TIMES OUT IN 60 SECONDS AND SHUTS DOWN THE PUMP. TDR2 IS RESET AT EACH POWER FAILURE AND WILL NOT ALLOW THE PUMP TO START UNTIL IT TIMES-OUT AFTER POWER IS RESTORED.

**PRE-LUBRICATION**  
 THE PRE-LUBRICATION SYSTEM IS ENERGIZED (PRE-LUB SOLENOID 1-SV1) IMMEDIATELY WHEN THE "START" PUSHBUTTON IS DEPRESSED OR THE PLC "START" COMMAND IS ISSUED. THE BLUE "PRE-LUBE" LIGHT IS ILLUMINATED. THE PRE-LUBRICATION PROCESS LASTS ONE (1) MINUTE AND THEN THE PUMP IS STARTED. AFTER THE PUMP IS RUNNING THE PRE-LUBRICATION SYSTEM IS DE-ENERGIZED AND THE BLUE LIGHT IS NO LONGER ILLUMINATED.

**SPEED CONTROL**  
 LOCATION WHERE SPEED IS TO BE CONTROLLED IS DESIGNATED BY A MANUAL/AUTO SWITCH ON THE VFD. CONTROL IS AS FOLLOWS.  
 AUTO - SPEED WILL BE CONTROLLED BY A SPEED POTENTIOMETER AT THE VFD.  
 MANUAL - THE PUMP SPEED WILL BE CONTROLLED BY THE PLC IN THE PUMP CONTROL PANEL.

**INDICATING LIGHTS**  
 LIGHTS ARE TO BE PROVIDED ON THE VFD AS FOLLOWS:  
 RED - RUN  
 GREEN - OFF  
 BLUE - PRE-LUBE

**ANNUNCIATION**  
 PUMP SHUTDOWN DUE TO DISCHARGE VALVE FAILURE TO OPEN, OR COMMON VFD FAILURE.

**NOTES:**  
 1. RELAY TDR2 DELAYS OPERATION OF THE PUMP UPON RESTORATION OF POWER FOLLOWING POWER FAILURE. SEE CHART ON THIS DRAWING FOR SETTING.

TABLE OF INTERCONNECTION WIRING				
CIRCUIT NUMBER	COLOR	CONNECTIONS		FUNCTION
		FROM	TO	
C1-1	B	PUMP NO. 1 VFD	PUMP STATION PLC	CONTROL
	R			
	BL			RUN STATUS
	O			
	Y			FAILURE ALARM
	BN			
	RB			INDICATION
	BLB			
	OB			CONTROL
	YB			
BNB			SPARE	
BR				
C1-2	B	PUMP NO. 1 VFD	MOTOR NO. 1	CONTROL
	R			
	BL			CONTROL
	O			
	Y			PRE-LUBE
	BN			
RB			SPARE	
11-1	ONE PAIR	PUMP NO. 1 VFD	PUMP STATION PLC	SPEED INDICATION
11-2	ONE PAIR	PLC	PUMP NO. 1 VFD	SPEED CONTROL

CONTACT DEVELOPMENT CONTROL SELECTOR SWITCH SS1			
CONTACTS	POSITIONS		
	HAND	OFF	AUTO
1-2	X		
3-4			X
5-6	X		X
7-8			X

X=CLOSED CONTACT

TIME DELAY RELAY SETTINGS		
PUMP	TDR	SETTINGS
PUMP NO. 1	1-TDR2	20 SEC.
PUMP NO. 1	1-TDR3	60 SEC.

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no.	date	by	revision
	8-15-01	JDF	As-Built



date NOV. 23, 1999  
 designed T. MOLL  
 detailed J. RECKART  
 checked E.L.T.

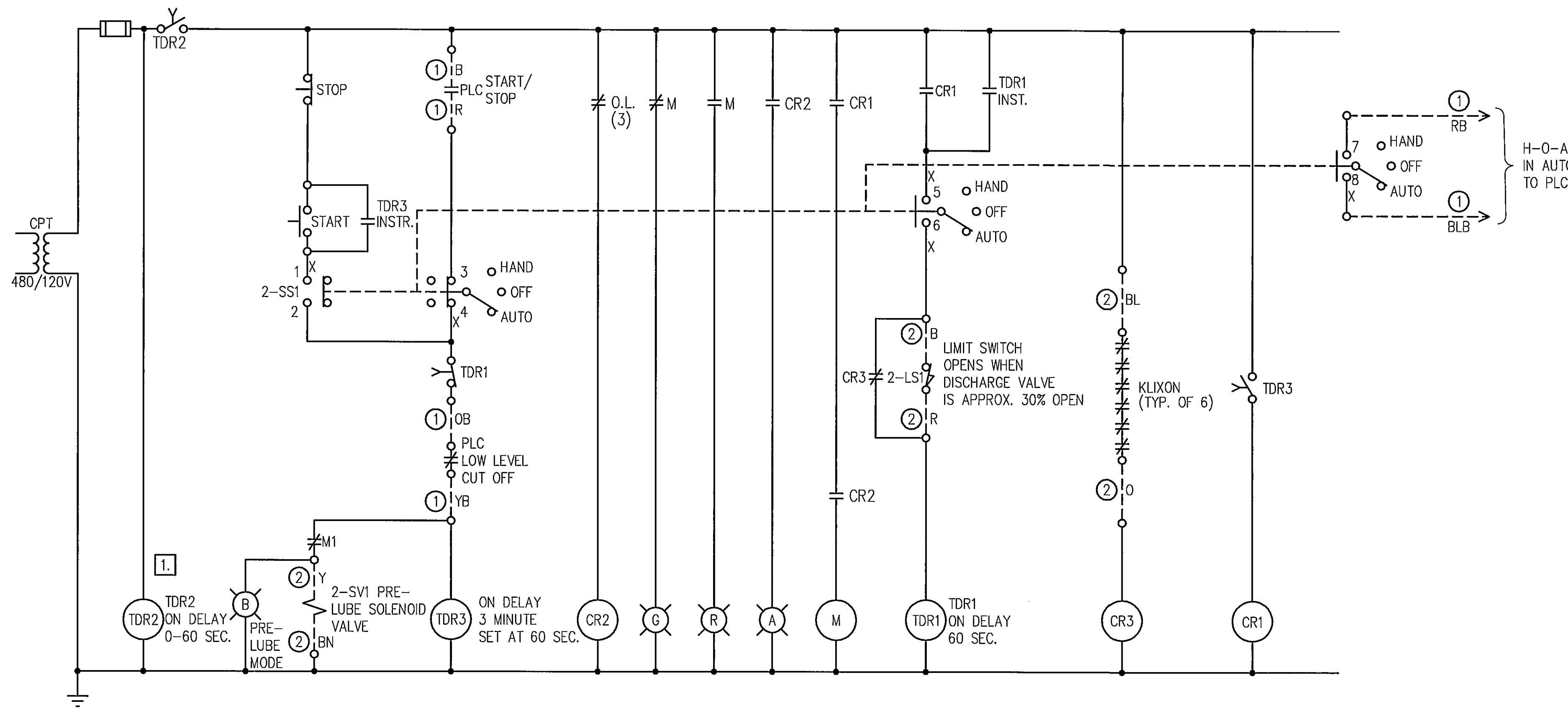
"AS-BUILT"



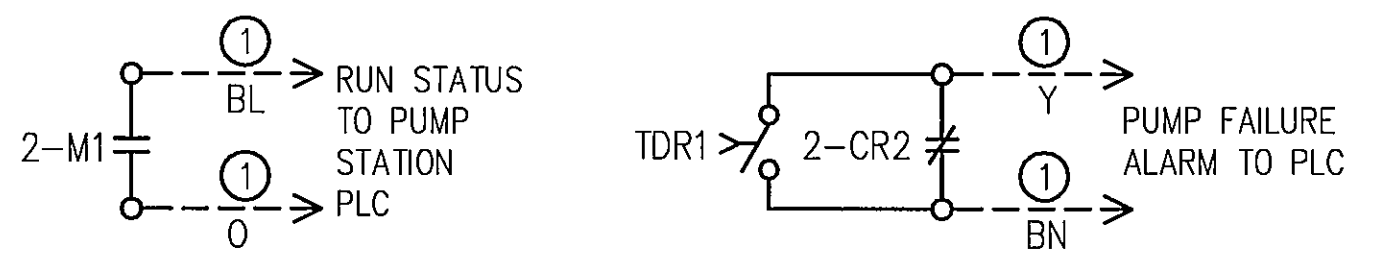
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LONDON BRIDGE BEACH PUMP HOUSE  
 PUMP CONTROL  
 DIAGRAMS NO. 1  
 project 97-777-1-002 contract W-183-00  
 drawing E5 rev. -  
 sheet 19 of 21 sheets  
 file Lbbpne05.dwg 03-21-2000 11:26 LJM



PUMP NO. 2 MOTOR STARTER  
(TYPICAL FOR PUMP NO. 3)



PUMP NO.	TABLE OF CORRESPONDING DEVICES AND CIRCUITS									
	DEVICES									
PUMP NO. 2	2-TDR1	2-TDR2	2-CR1	2-CR2	2-CR3	2-SS1	2-LS1	2-SV1	C2-1	C2-2
PUMP NO. 3	2-TDR11	2-TDR12	2-CR11	2-CR12	2-CR13	2-SS11	2-LS11	2-SV11	C2-11	C2-12

TIME DELAY RELAY SETTINGS		
PUMP	TDR	SETTINGS
PUMP NO. 2	2-TDR2	30 SEC.
PUMP NO. 2	2-TDR3	60 SEC.
PUMP NO. 3	2-TDR12	40 SEC.
PUMP NO. 3	2-TDR13	60 SEC.

CONTACTS	CONTACT DEVELOPMENT		
	CONTROL SELECTOR SWITCH SS1 AND SS11		
	POSITIONS		
	HAND	OFF	AUTO
1-2	X		
3-4			X
5-6	X		X
7-8			X

X=CLOSED CONTACT

**DESCRIPTION OF OPERATION**  
**PUMP CONTROL**  
 THE PUMP STARTER SHALL HAVE A H-O-A SWITCH WITH CONTROLS AS FOLLOWS:  
 HAND - THE PUMP SHALL BE STARTED/STOPPED FROM THE STARTER.  
 OFF - THE PUMP IS OFF.  
 AUTO - THE PUMP SHALL BE CONTROLLED BY THE PLC.  
 IF THE LEVEL FALLS TO 390'-0", THE PLC SHALL INITIATE A BACKUP, LOW LEVEL CUTOFF COMMAND TO ALL PUMPS.  
 IF THE DISCHARGE VALVE FAILS TO OPEN OR HIGH MOTOR TEMPERATURE AFTER THE PUMP STARTS, TDR1 TIMES OUT IN 60 SECONDS AND SHUTS DOWN THE PUMP. TDR2 IS RESET AT EACH POWER FAILURE AND WILL NOT ALLOW THE PUMP TO START UNTIL IT TIMES-OUT AFTER POWER IS RESTORED.

**PRE-LUBRICATION**  
 THE PRE-LUBRICATION SYSTEM IS ENERGIZED (PRE-LUBE SOLENOID 2-SV1) IMMEDIATELY WHEN THE "START" PUSHBUTTON IS DEPRESSED OR THE PLC "START" COMMAND IS ISSUED. THE BLUE "PRE-LUBE" LIGHT IS ILLUMINATED. THE PRE-LUBRICATION PROCESS LASTS ONE (1) MINUTE AND THEN THE PUMP IS STARTED. AFTER THE PUMP IS RUNNING THE PRE-LUBRICATION SYSTEM IS DE-ENERGIZED AND THE BLUE LIGHT IS NO LONGER ILLUMINATED.

**INDICATING LIGHTS**  
 LIGHTS ARE TO BE PROVIDED ON THE MOTOR STARTER AS FOLLOWS:  
 RED - RUN  
 GREEN - OFF  
 BLUE - PRE-LUBE  
 AMBER - PUMP OVERLOAD ALARM

**ANNUNCIATION**  
 PUMP SHUTDOWN DUE TO DISCHARGE VALVE FAILURE TO OPEN, OR COMMON STARTER FAILURE.

**NOTES:**  
 1. RELAY TDR2 DELAYS OPERATION OF THE PUMP UPON RESTORATION OF POWER, FOLLOWING POWER FAILURE. SEE CHART ON THIS DRAWING FOR SETTINGS.

CIRCUIT NUMBER	COLOR	CONNECTIONS		FUNCTION
		FROM	TO	
C2-1		PUMP NO. 3 MOTOR STARTER	PUMP STATION PLC	CONTROL
	B			
	R			
	BL			
	O			
	Y			
	BN			STATUS
	RB			
	BLB			MOTOR STARTER IN "AUTO" MODE
	OB			
	YB			CONTROL
	BNB			
	BR			SPARES
C2-2		PUMP NO. 3 MOTOR STARTER	PUMP MOTOR NO. 3	CONTROL
	B			
	R			
	BL			
	O			
	Y			
	BN			PRE-LUBE
	RB			
				SPARE

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	8-15-01	JDF	AS-BUILT

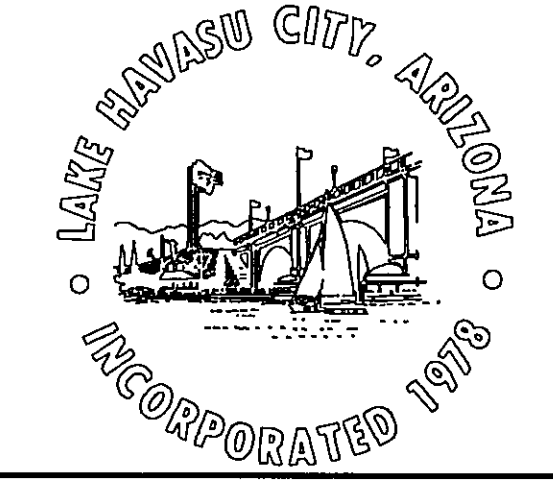
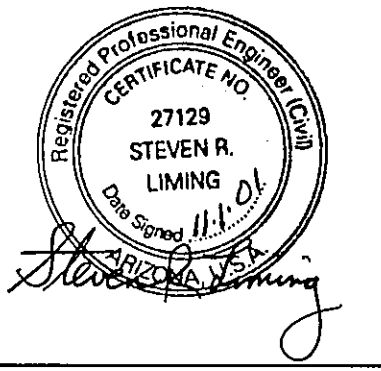


date NOV. 23, 1999  
 designed T. MOLL  
 detailed J. RECKART  
 checked E.L.T.

"AS-BUILT"

2

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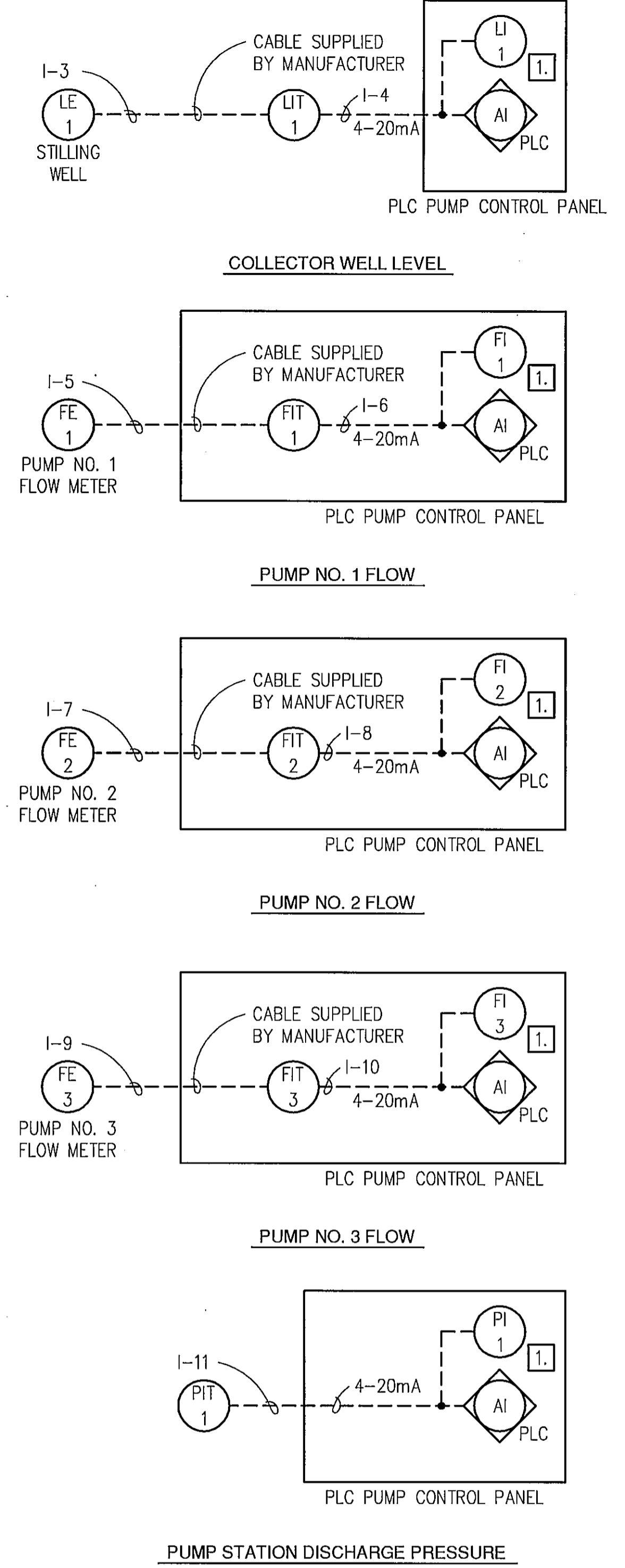
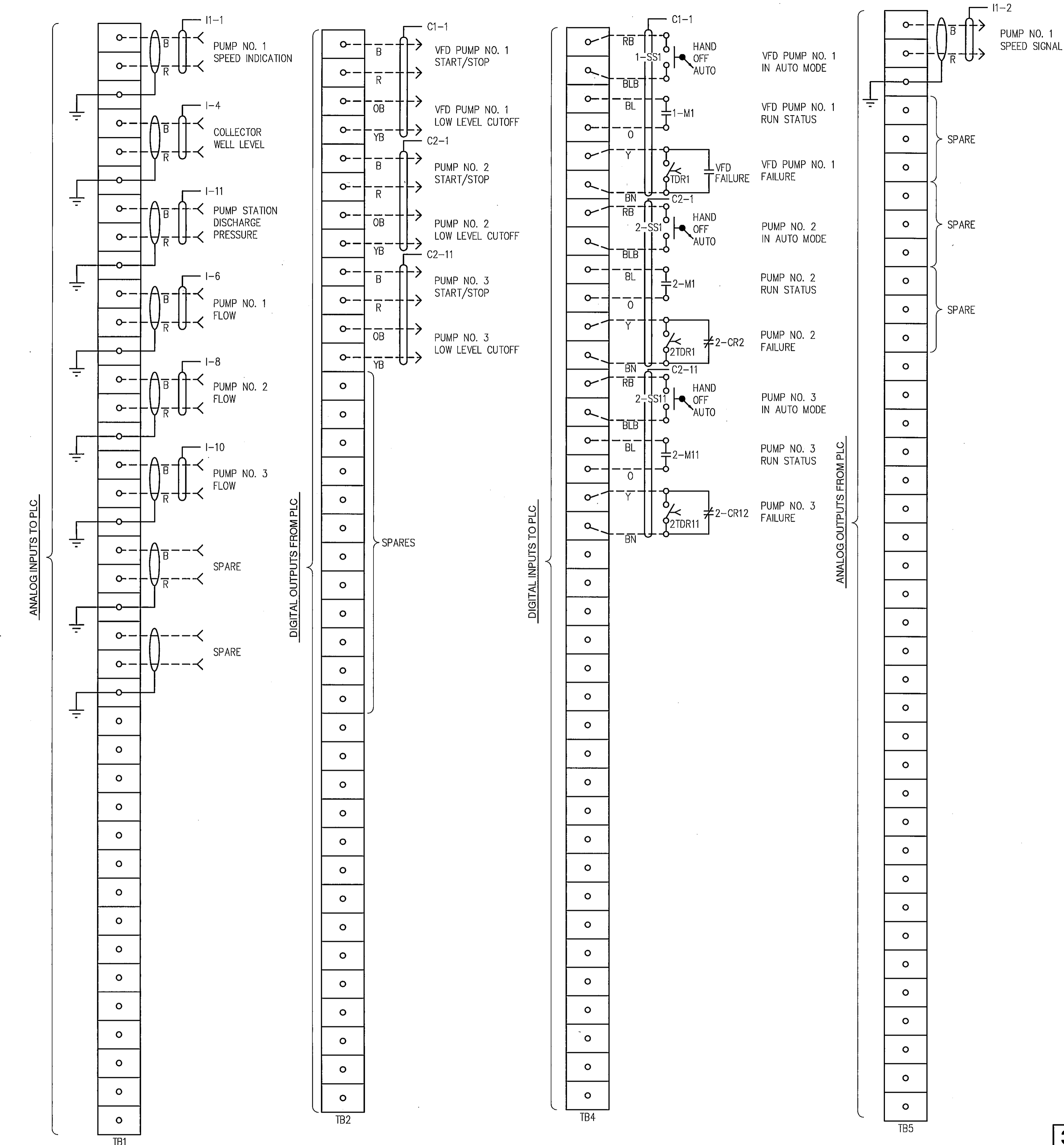


LONDON BRIDGE BEACH PUMP HOUSE  
 PUMP CONTROL  
 DIAGRAMS NO. 2

project 97-777-1-002 contract W-183-00  
 drawing E6 rev. -  
 sheet 20 of 21 sheets  
 file Lbbp06.dwg 03-21-2000 11:31 LJM

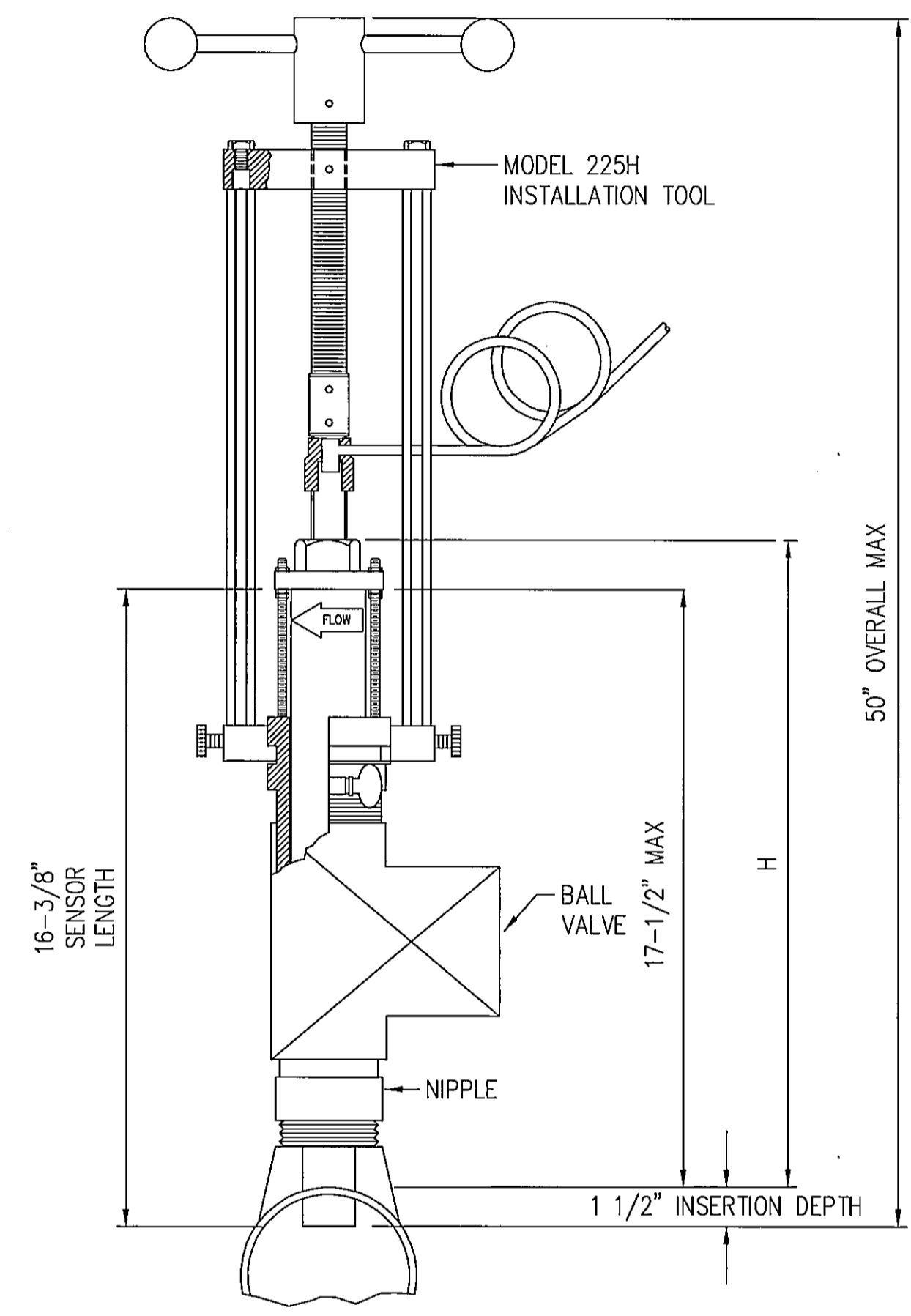
Scale For Microfilming  
 Millimeters  
 Inches

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**NOTES:**

1. MOUNT ON FACE OF PLC PUMP CONTROL PANEL.
2. POWER INSTRUMENTATION AT PLC PUMP CONTROL PANEL ON ONE CIRCUIT. PROTECT EACH UNIT SEPARATELY BY FUSED DISCONNECT INSIDE THE CONTROL PANEL. SIZE ACCORDING TO NEC.



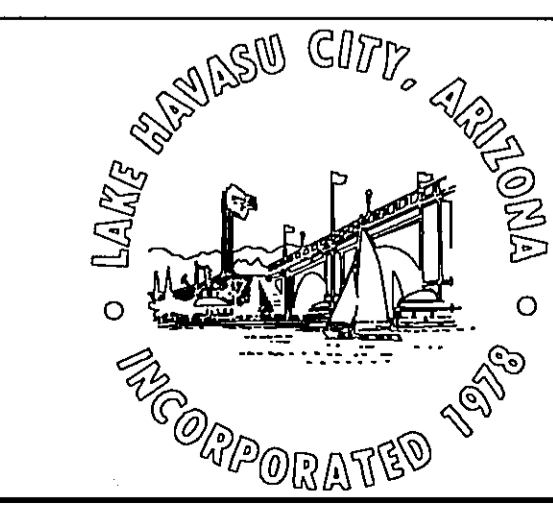
**NOTES:**

1. ALL DIMENSIONS ARE FOR REFERENCE ONLY. CUTTING TOOL MAY REQUIRE ADDITIONAL CLEARANCE.

no.	date	by	revision
8-15-01	JDF	AS-BUILT	



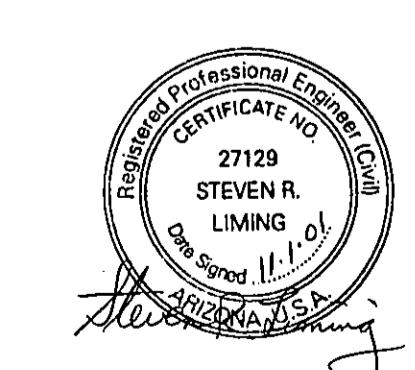
date DEC. 8, 1999  
 detailed J. RECKART  
 designed T. MOLL  
 checked E.L.T.



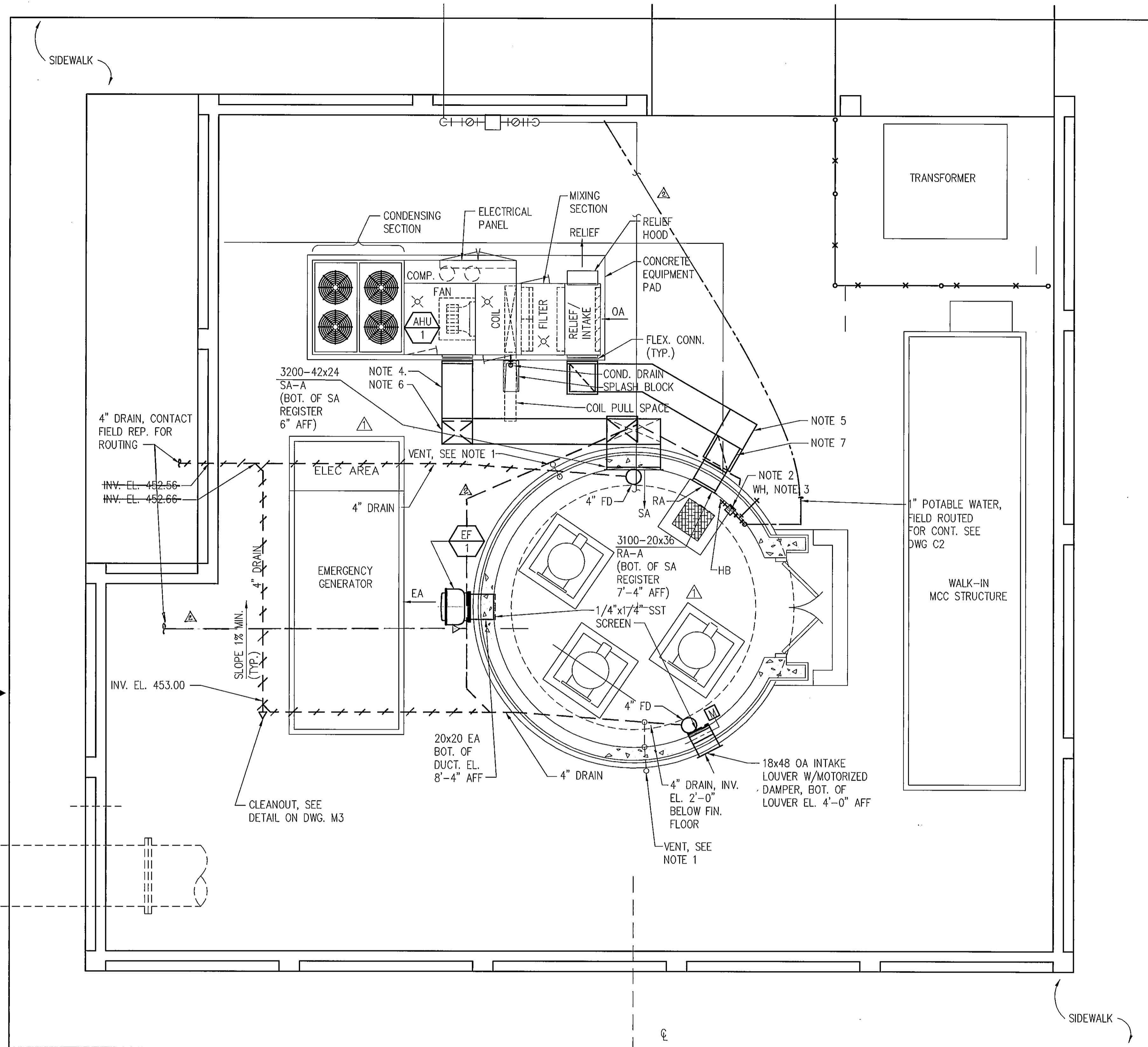
LONDON BRIDGE BEACH PUMP HOUSE  
 PLC I/O WIRING DIAGRAMS  
 AND MISC. DETAILS

project 97-777-1-002 contract W-183-00  
 drawing E7 rev. -  
 sheet 21 of 21 sheets  
 file Lbbphe07.dwg 05-26-2000 16:32 M.JN

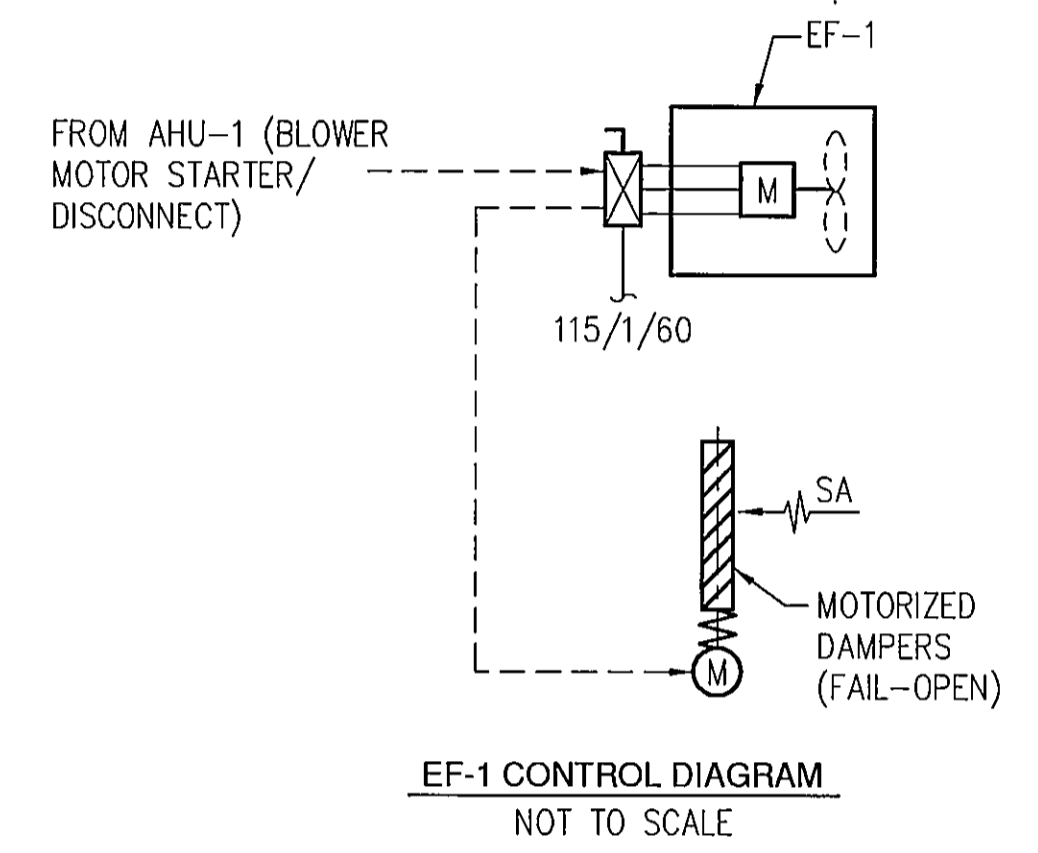
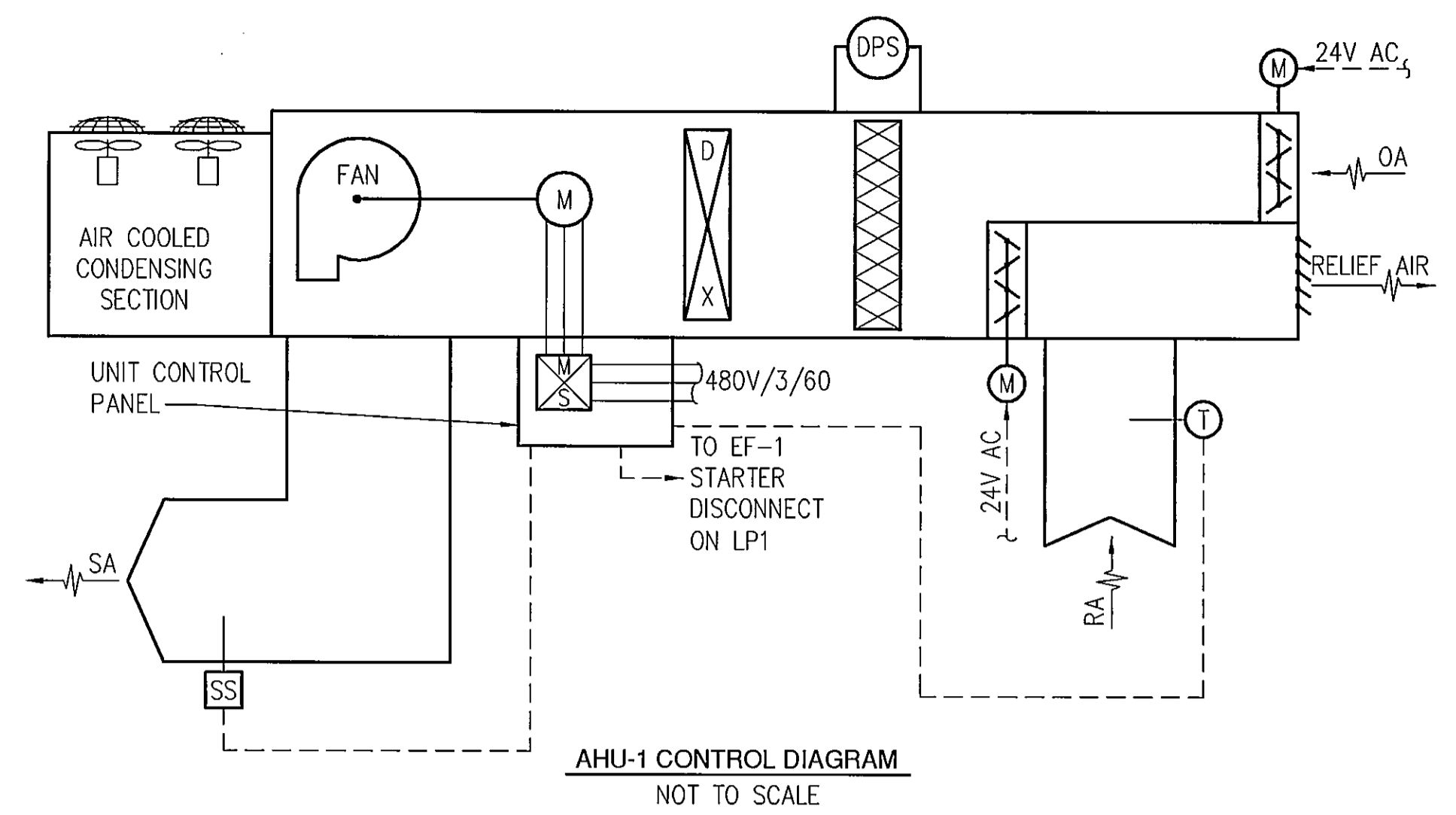
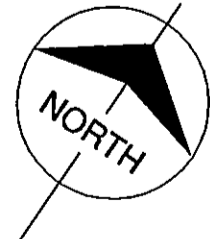
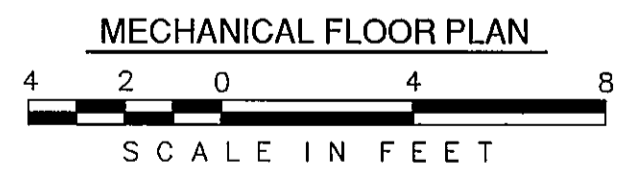
CALL TWO WORKING DAYS BEFORE YOU DO  
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 (OUTSIDE MARICOPA COUNTY)







- NOTES:**
- FLOOR DRAIN VENT TO PENETRATE PUMP HOUSE WALL AT 8'-6" ABOVE FINISHED FLOOR, TOP OF VENT ON OUTSIDE WALL SHALL BE 9'-6" ABOVE FINISHED FLOOR. (TYPICAL 2 PLACES)
  - 1" BACKFLOW PREVENTER, ? EL. 3'-6" ABOVE FINISHED FLOOR.
  - WALL HYDRANT (WH) AND HOSE BIBB (HB) ? EL. AT 3'-6" ABOVE FINISHED FLOOR.
  - 24x18 SA DUCT, BOTTOM OF DUCT EL. ±3'-9" ABOVE CONC. EQUIP. PAD.
  - 24x18 RA DUCT, BOTTOM OF DUCT EL. ±8" ABOVE CONC. EQUIP. PAD.
  - 24x18 90° ELBOW DOWN. TRANSITION FROM 24x18 TO 42x18.
  - 24x18 90° ELBOW UP. TRANSITION FROM 24x18 TO 20x20.



**DESCRIPTION:**  
 SYSTEM SHALL BE CONSTANT VOLUME, COOLING/VENTILATION AIR HANDLING UNIT TO MAINTAIN SUPPLY AIR TEMPERATURE OF 95F (ADJ.) UNIT SHALL BE CONTROLLED BY A ROOM THERMOSTAT.

**SEQUENCE OF OPERATION**

**COOLING:**

- GENERAL:  
 ALL SETPOINTS SHALL BE ADJUSTABLE. CONTROLS SHALL BE PROVIDED BY UNIT MOUNTED CONTROLLER.
- AHU OPERATION:  
 THE SUPPLY FAN SHALL OPERATE CONTINUOUSLY. OUTDOOR AIR DAMPER SHALL BE IN MINIMUM OPEN POSITION. AS RETURN AIR TEMPERATURE RISES ABOVE COOLING SETPOINT OF 95° F, OUTDOOR AIR DAMPER SHALL MODULATE OPEN AND THE RETURN AIR DAMPER SHALL MODULATE CLOSED TO SATISFY RETURN AIR TEMPERATURE. OUTDOOR AIR DAMPER SHALL MODULATE TO MINIMUM OPEN POSITION WHEN OUTDOOR AIR ENTHALPY IS GREATER THAN SETPOINT ENTHALPY (REFERENCE ENTHALPY ECONOMIZER). ON A CONTINUED RISE IN RETURN AIR TEMPERATURE, FIRST STAGE OF MECHANICAL COOLING SHALL BE ENERGIZED. MECHANICAL COOLING SHALL BE STAGED UP AS RETURN AIR TEMPERATURE CONTINUES TO RISE. ON A DROP IN SPACE TEMPERATURE THE REVERSE SEQUENCE SHALL OCCUR.

**SAFETY CONTROLS:**

**SUPPLY FAN**

- SUPPLY AIRFLOW SWITCH, SS, MAKES ON SUPPLY AIR SHUT OFF. EF-1 IS ENERGIZED.
- SUPPLY AIRFLOW SWITCH, SS, OPENS ON SUPPLY AIRFLOW. EF-1 IS DE-ENERGIZED.

**DIRTY FILTER**

- DIFFERENTIAL PRESSURE SWITCH, DPS, MAKES ON INCREASING STATIC PRESSURE WHEN DIFFERENTIAL PRESSURE ACROSS THE 30% ASHRAE EFFICIENCY FILTER REACHES 1.0 IN. W.C. (ADJ.). "DIRTY 30% FILTER" INDICATION IS ENERGIZED ON THE UNIT CONTROL PANEL.

**NOTE:**

- EXHAUST FAN, EF-1, SHALL BE CONTROLLED THROUGH THE FAN COMBINATION STARTER. WHEN THE H-0-A IS IN THE AUTOMATIC (A) POSITION, THE FAN SHALL RUN WHEN A PERMISSIVE START IS RECEIVED FROM THE AIR HANDLING UNIT. WHEN H-0-A IS PLACED IN THE HAND (H) POSITION, THE FAN SHALL RUN CONTINUOUSLY.

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no.	date	by	revision
▲	7-25-01	JJM	(A1 -G8) REVISE DRAWING TO ACCOMMODATE COLLECTOR WELL "AS BUILT" CONDITION
▲	8-15-01	JDF	REVISED WATER & DRAIN LINES
▲	8-15-01	JDF	AS-BUILT

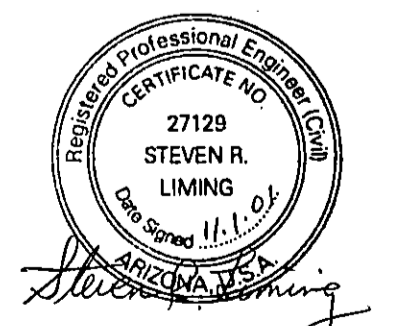


date NOV. 12, 1999 detailed R.L. BENNETT  
 designed R.L. BENNETT checked R.G.H.

**"AS-BUILT"**

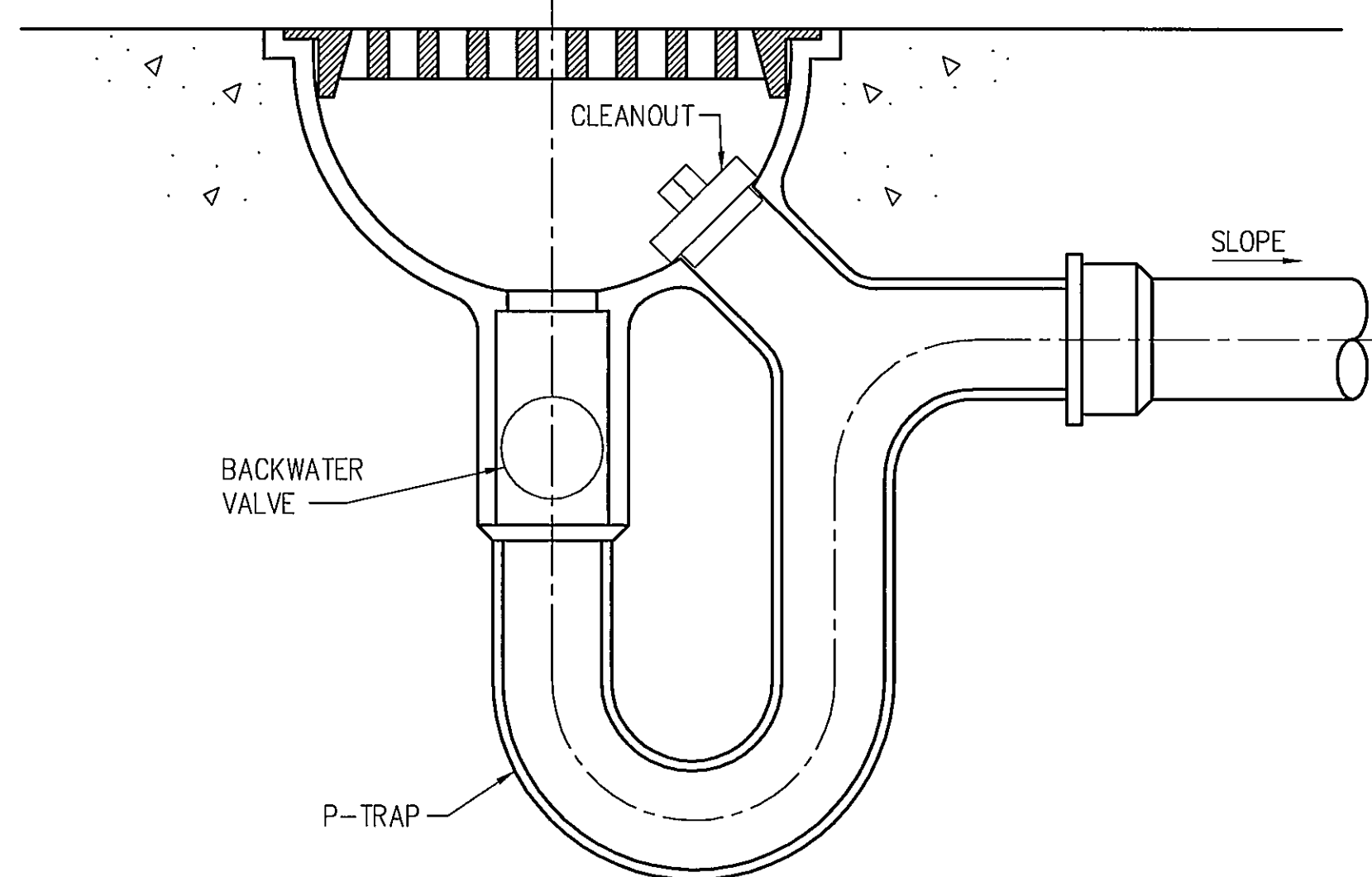


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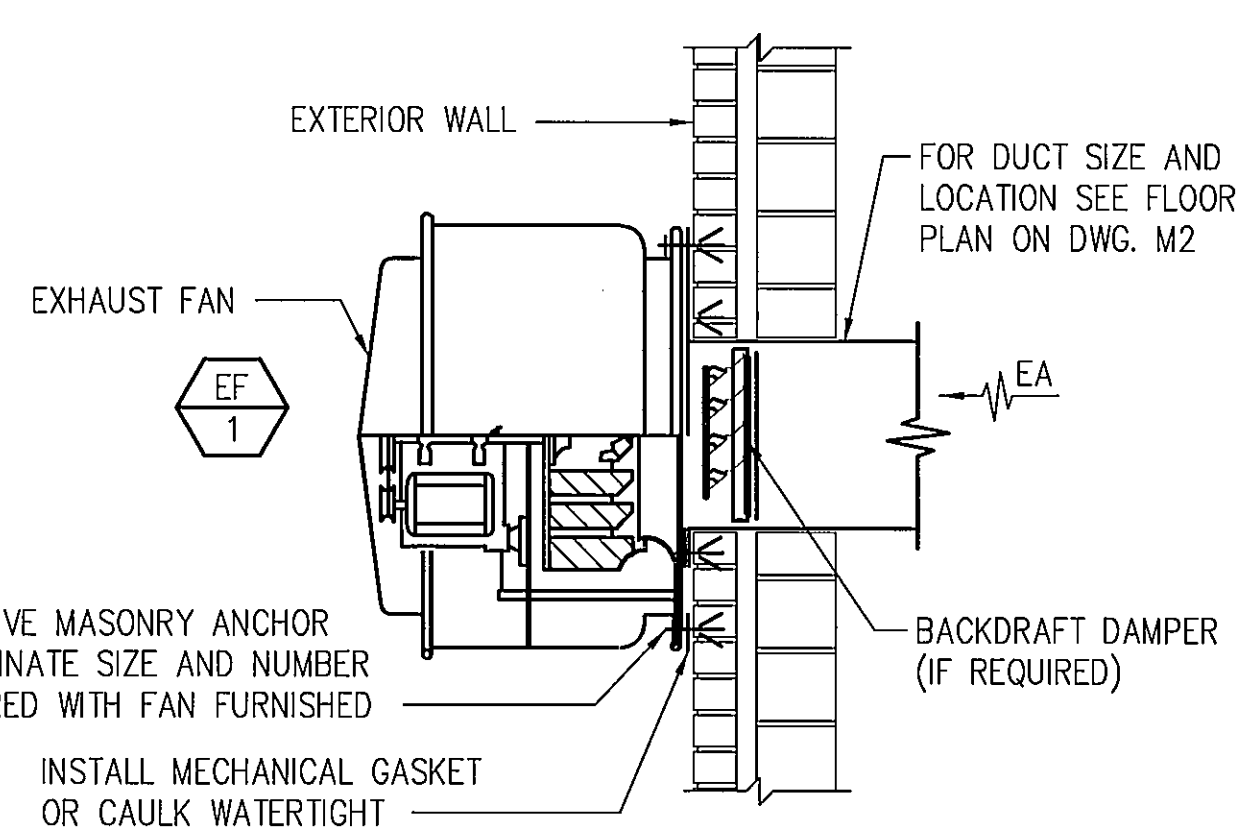


**LONDON BRIDGE BEACH PUMP HOUSE**  
 HVAC AND PLUMBING FLOOR PLAN  
 AND HVAC CONTROL SEQUENCE  
 OF OPERATION DIAGRAMS

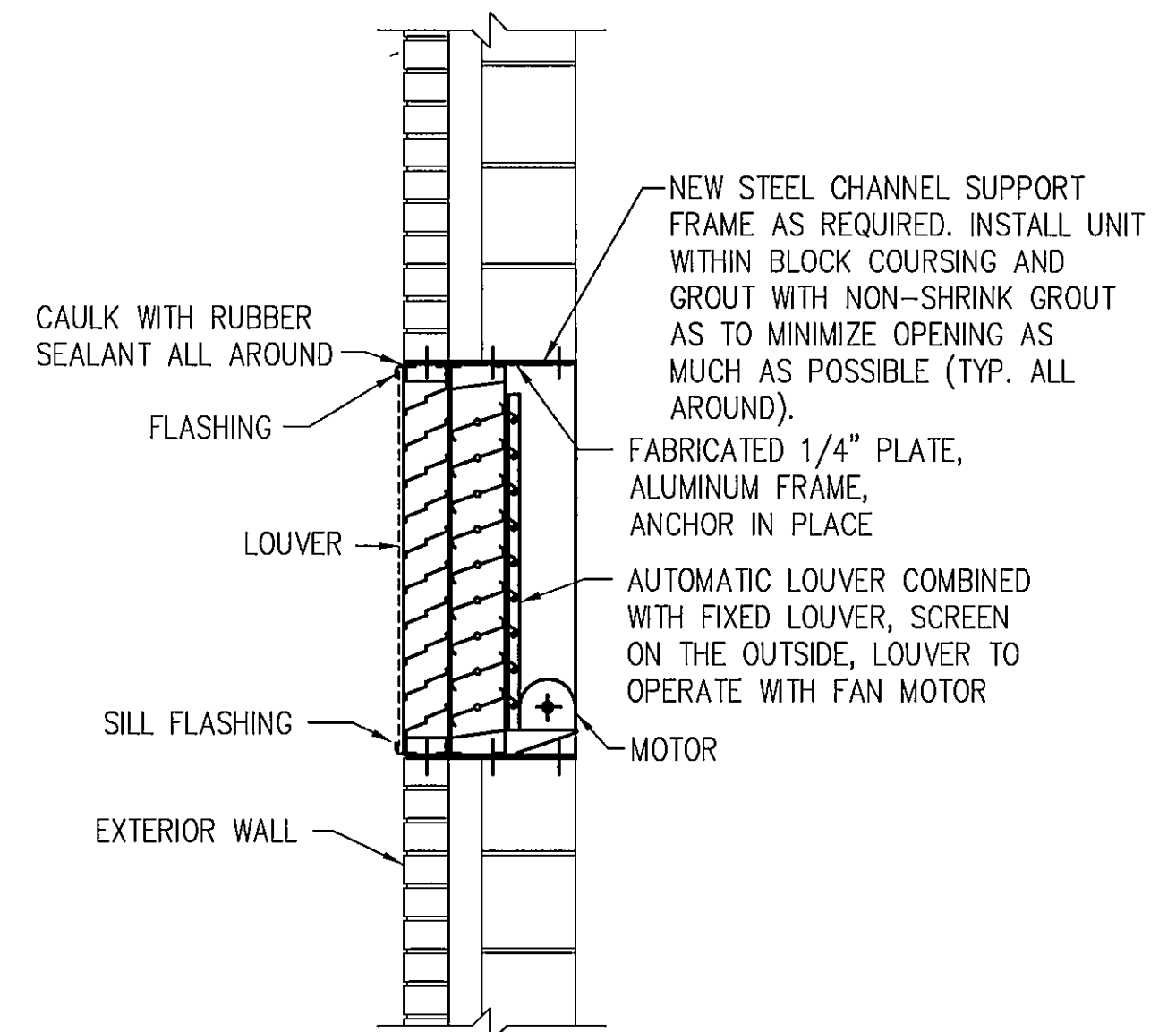
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 drawing **M2** rev. 2  
 sheet 13 of 21 sheets  
 file Lbbphm01.dwg 06-14-2000 13:34 LJM



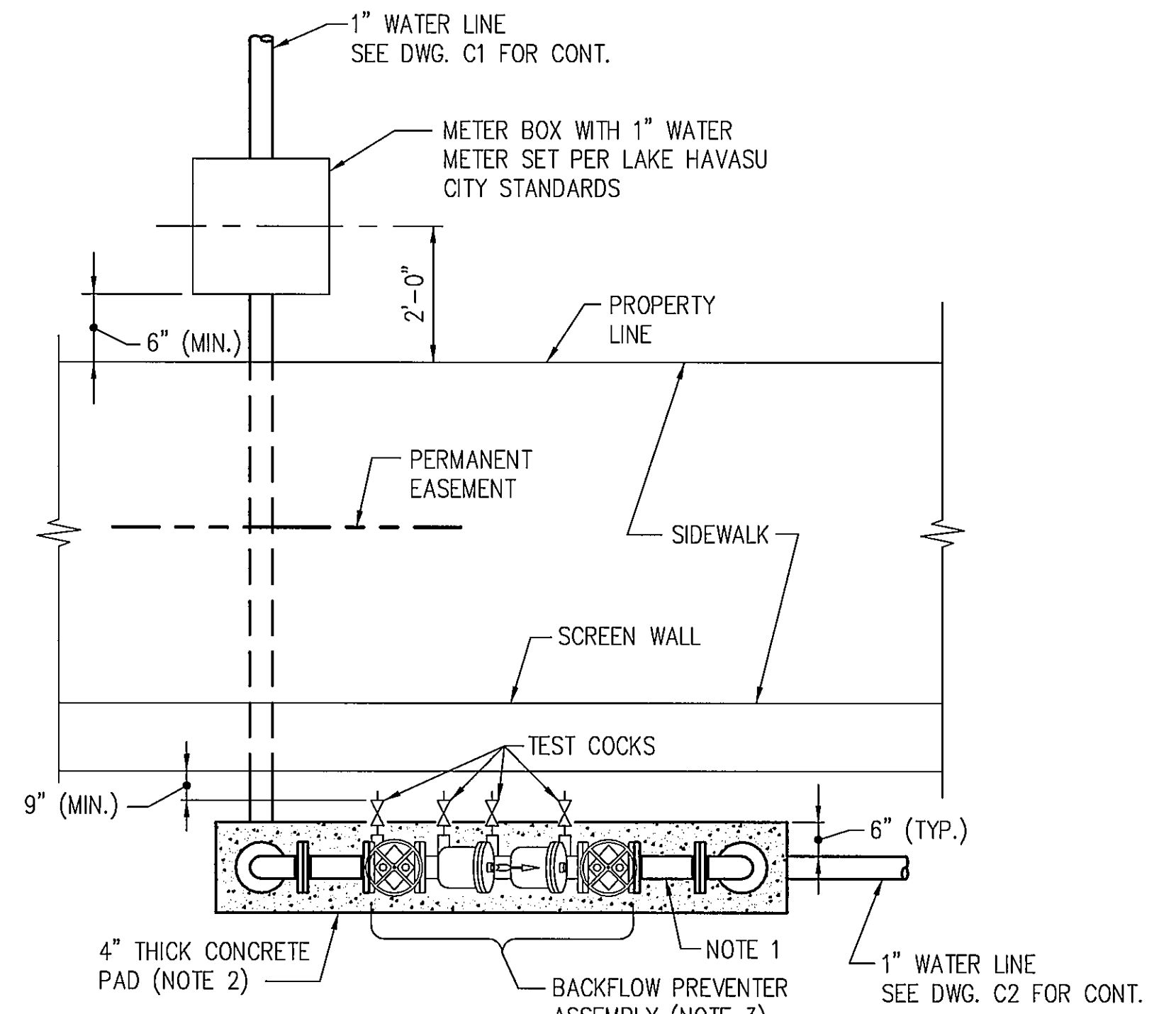
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DETAIL**  
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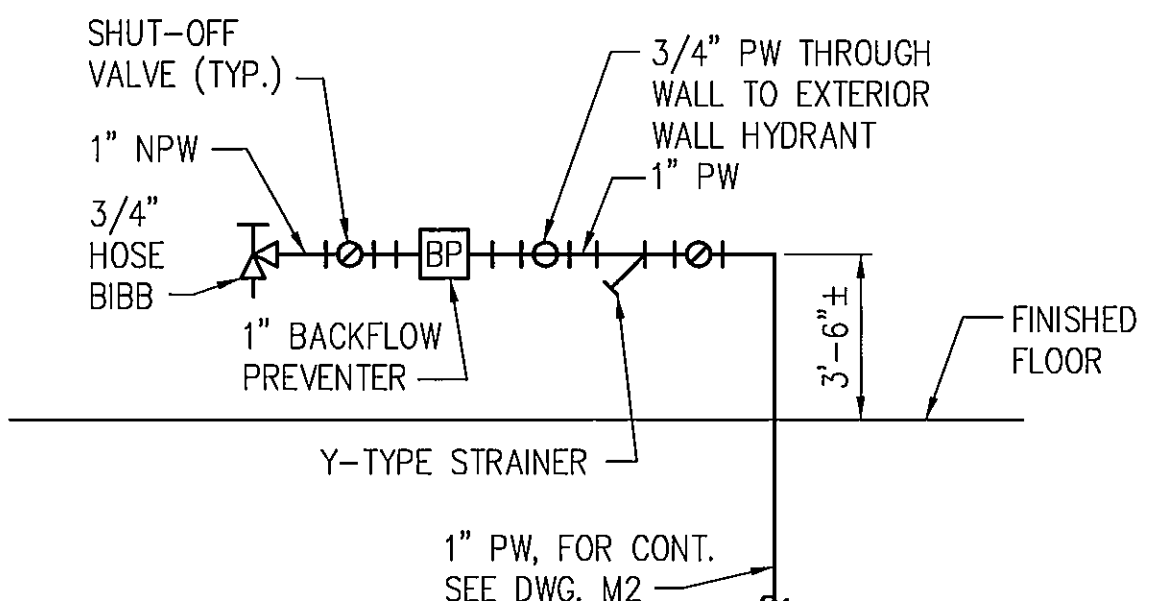
**EXHAUST FAN INSTALLATION  
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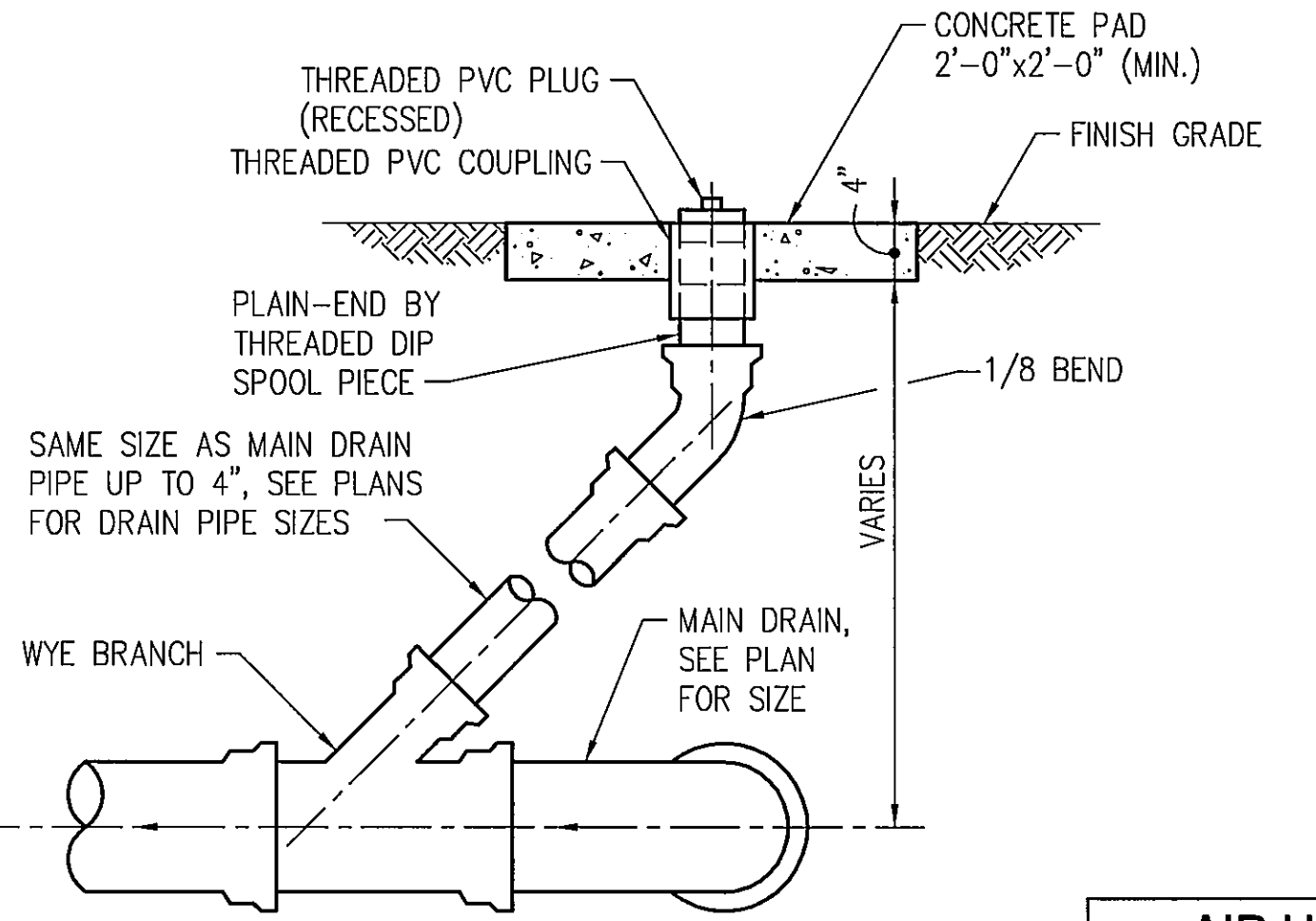
**TYPICAL OUTSIDE AIR LOUVER WITH  
MOTORIZED DAMPER  
DETAIL**  
NOT TO SCALE



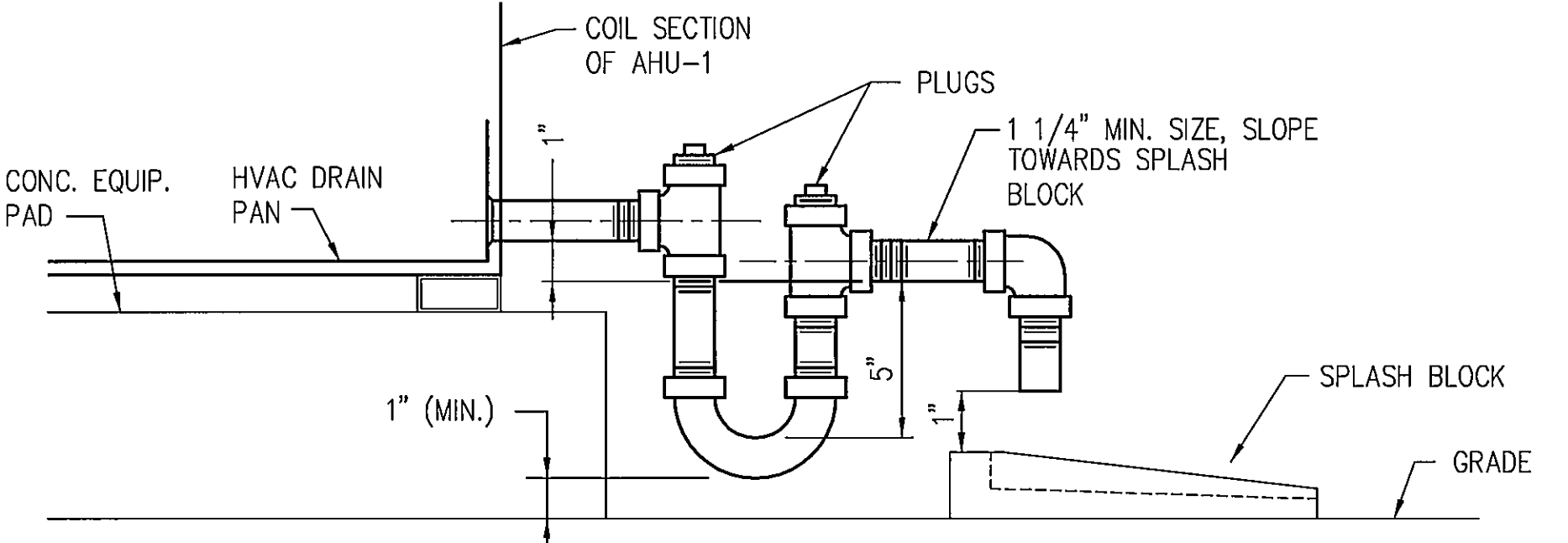
**PLAN VIEW**



**INSIDE PUMP HOUSE  
BACKFLOW PREVENTER  
INSTALLATION  
DETAIL**  
NOT TO SCALE



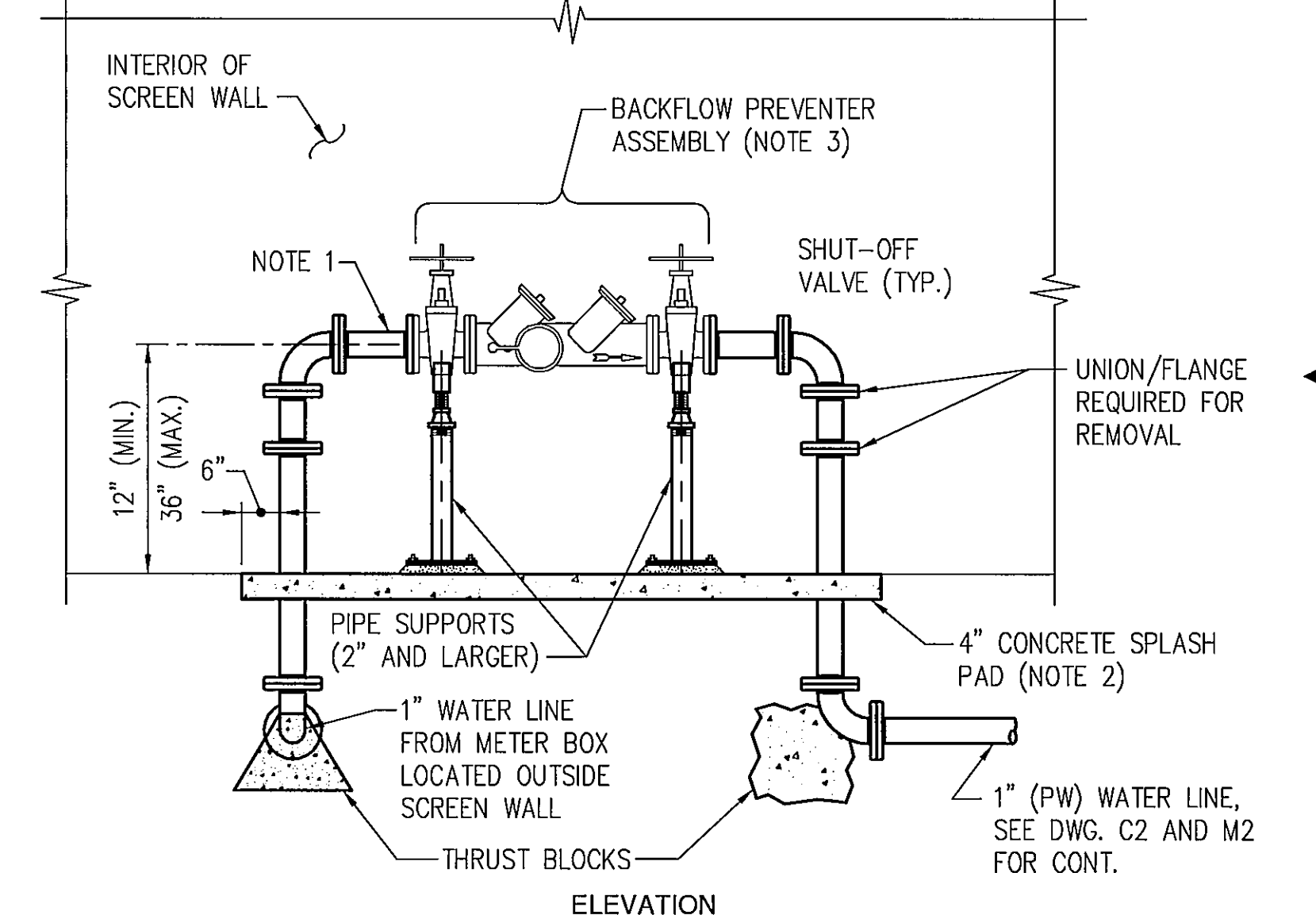
**EXTERIOR CLEANOUT  
DETAIL**  
NOT TO SCALE



**HVAC CONDENSATE TRAP  
DRAIN  
DETAIL**  
NOT TO SCALE

EXHAUST FAN (EF) SCHEDULE	
FAN NUMBER	EF-1
LOCATION DRAWING NUMBER	M2
MANUFACTURER	GREENHECK
MODEL NUMBER	GWB-14
CFM @ STANDARD CONDITIONS	1,500
STATIC PRESSURE (INCHES W.C.)	0.375
APPROX WHEEL RPM	1090
APPROX MOTOR H.P.	1/4
MAX. SONES	7.4
ELECTRICAL DATA (VOLTS/PHASE/HERTZ)	120/1/60
DRIVE TYPE	BELT
FAN TYPE	DOME
FAN MOUNTING	WALL MOUNTED

AIR HANDLING UNIT (AHU) SCHEDULE	
UNIT NUMBER	AHU-1
LOCATION DRAWING NUMBER	M2
MANUFACTURER	ENGINEERED AIR
FAN DATA:	
SUPPLY:	
MODEL NUMBER	FWB-152
TOTAL FLOW (SCFM)	3,200
OUTSIDE AIR FLOW (SCFM)	500
EXTERNAL STATIC PRESSURE (IN. W.C.)	1.50
APPROX. MOTOR H.P.	5
ELECTRICAL DATA (VOLTS/PHASE/HERTZ)	460/3/60
RETURN:	
TOTAL FLOW (SCFM)	3,100
COOLING COIL DATA:	
TYPE	DX
MAX. COIL FACE VELOCITY (FPM)	500
TOTAL COIL LOAD (BTUH)	152,667
TOTAL SENSIBLE COIL LOAD (BTUH)	152,562
ENTERING AIR TEMP DB / WB (F)	98.4/67
LEAVING AIR TEMP DB / WB (F)	55/51
NUMBER OF COMPRESSORS	2
NUMBER OF CONDENSER FANS	4
AMBIENT DESIGN TEMPERATURE (F)	125



**ELEVATION**

- NOTES:**
- ALL PIPING ABOVE GROUND SHALL BE BRASS, COPPER (TYPE K) OR D.I.P.
  - CONCRETE PAD SHALL BE 2500 PSI.
  - USS-FCCCHR APPROVED BACKFLOW PREVENTER ASSEMBLY.

**WATER SUPPLY AT METER LOCATION  
BACKFLOW PREVENTER  
INSTALLATION  
DETAIL**  
NOT TO SCALE

Scale For Microminifiling  
Millimeters  
Inches

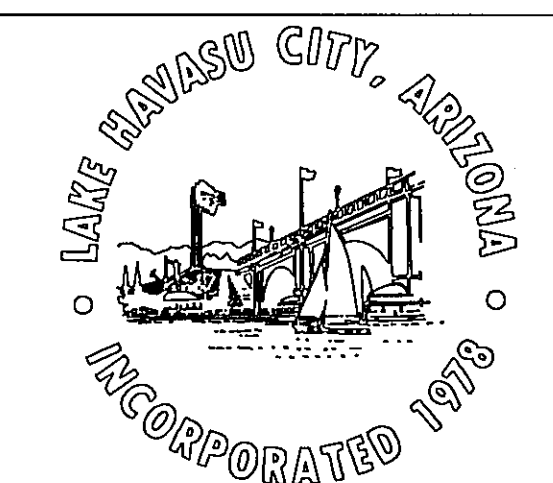
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no.	date	by	revision
	8-15-01	JDF	AS-BUILT

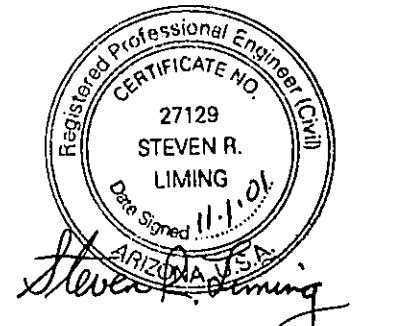


date NOV. 23, 1999  
designed R.L. BENNETT  
detailed R.L. BENNETT  
checked R.G.H.

**"AS-BUILT"**



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LONDON BRIDGE BEACH PUMP HOUSE  
MISCELLANEOUS DETAILS  
AND SCHEDULES

project	97-777-1-002	contract	W-183-00
drawing	<b>M3</b>	rev.	
sheet	14	of	21 sheets
file	LBBPHM03.dwg	04-19-2000	08:18 RLB



### PIPING

	GATE VALVE		BACKFLOW PREVENTER
	GLOBE VALVE		VACUUM BREAKER
	BUTTERFLY VALVE		MOISTURE SEPARATOR
	CHECK VALVE		IN-LINE FLOW METER
	STOP CHECK VALVE		SIGHT FLOW INDICATOR
	AUTOMATIC RECIRCULATION CHECK VALVE		FLEXIBLE HOSE
	PLUG VALVE		EXPANSION ELEMENT (JOINT)
	3-WAY PLUG VALVE (2-PORT)		FLEXIBLE BALL JOINT
	3-WAY PLUG VALVE (3-PORT)		BASKET TYPE STRAINER
	4-WAY PLUG VALVE (4-PORT)		TEE TYPE STRAINER
	3-WAY VALVE		Y-TYPE STRAINER
	ANGLE VALVE		CONICAL STRAINER
	RELIEF OR SAFETY VALVE		DUPLEX STRAINER
	HOSE GATE DRAIN VALVE		STEAM TRAP ASSEMBLY
	PINCH VALVE		SLEEVE COUPLING (SC)
	NEEDLE VALVE		HARNESSED SLEEVE COUPLING (HSC)
	DIAPHRAGM VALVE		INSULATED SLEEVE COUPLING (ISC)
	BALL VALVE		FLANGED COUPLING ADAPTER (FCA)
	SELF-CONTAINED PRESSURE REDUCING (REGULATING VALVE)		DRAINER ASSEMBLY
	SURGE RELIEF VALVE		SAMPLE COOLER
	KNIFE GATE VALVE		INSULATING FLANGE (I.F.)
	CORPORATION STOP		RESTRICTING ORIFICE
	AIR RELEASE VALVE		STRAIGHTENING VANE
	VACUUM VALVE		RUPTURE DISK
	AIR AND VACUUM VALVE		PIPE GUIDE
	BLOW-OFF VALVE ASSEMBLY		PIPE WITH HEATING CABLE
	LOCKED OPEN		DRIP POCKET ASSEMBLY
	LOCKED CLOSED		UNION
	GAUGE SEAL		PIPE ANCHOR
			REDUCER
			DISCHARGE ELBOW ASSEMBLY

### VALVE OPERATORS

	CYLINDER		BLIND FLANGE
	DIAPHRAGM		CLEANOUT
	MOTOR		YARD HYDRANT
	SOLENOID		AIR COCK
	DIAPHRAGM WITH HANDWHEEL		HOSE BIBB
	CHAINWHEEL		WALL HYDRANT
	FLOAT		QUICK DISCONNECT COUPLING
			EXHAUST TO ATMOSPHERE (INSIDE)
			EXHAUST TO ATMOSPHERE (OUTSIDE)

### ABBREVIATIONS

A.A.C.	ARIZONA ADMINISTRATIVE CODE	NC	NORMALLY CLOSED
ACP	ASBESTOS CEMENT PIPE	N.O.	NORMALLY OPENED
ADOT	ARIZONA DEPARTMENT OF TRANSPORTATION	P-1	PUMP NO. 1
ARV	COMBINATION AIR/VACUUM RELIEF VALVE OR AIR RELIEF VALVE	PCCP	PRESTRESSED CONCRETE CYLINDER PIPE
BFV	BUTTERFLY VALVE	PP	POWER POLE
CP	COUPLING/CONNECTOR	PS-1	PIPE SUPPORT-1
CV	CHECK VALVE	PUE	PUBLIC UTILITY EASEMENT
DE	DRAINAGE EASEMENT	PVI	POINT OF VERTICAL INFLECTION
D.I.P.	DUCTILE IRON PIPE	RCP	REINFORCED CONCRETE PIPE
EL	ELEVATION	RJ	RESTRAINED JOINT
FH	FIRE HYDRANT	R/W	RIGHT OF WAY
FL	FLOW LINE	SV	SEWER VALVE
GV	GATE VALVE	TJB	TELEPHONE JUNCTION BOX
GM	GAS METER	UGT	UNDERGROUND TELEPHONE LINE
G	GAS LINE	WM	WATER METER
INV	INVERT	WV	WATER VALVE
LP	LIGHT POLE		
MJ	MECHANICAL JOINT		
MW	GROUNDWATER MONITORING WELL		

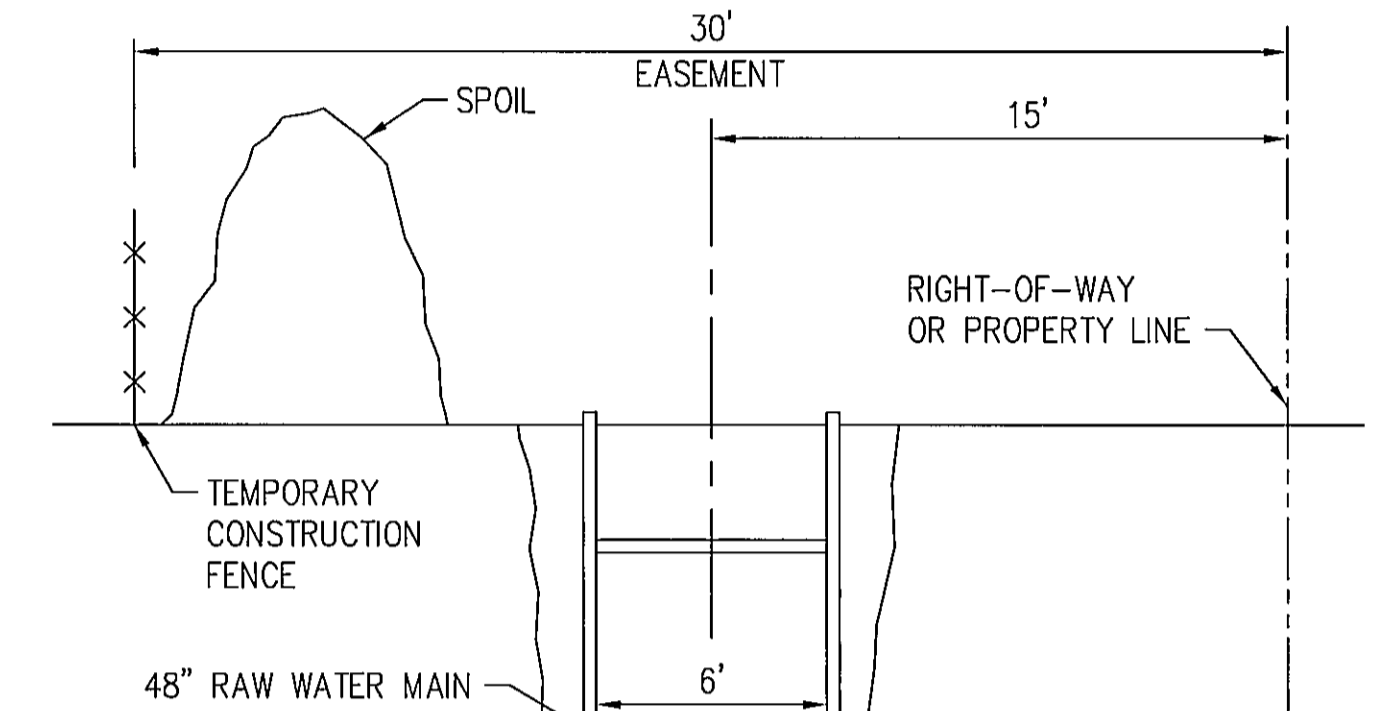
### INSTRUMENTS

	FLOW METERING ELEMENT		P - PRESSURE GAUGE
	GG - GAUGE GLASS		PC - PRESSURE CONTROLLER
	LI - LEVEL INDICATOR		PS - PRESSURE SWITCH
	LC - LEVEL CONTROLLER		PX - PRESSURE TRANSMITTER
	LLS - LIQUID LEVEL SWITCH		P - DIFFERENTIAL PRESSURE GAUGE
	LX - LEVEL TRANSMITTER		PC - DIFFERENTIAL PRESSURE CONTROLLER
	FI - FLOW INDICATOR		PS - DIFFERENTIAL PRESSURE SWITCH
	FC - FLOW CONTROLLER		PX - DIFFERENTIAL PRESSURE TRANSMITTER
	FS - FLOW SWITCH		TC - TEST CONNECTION
	FX - FLOW TRANSMITTER		PT - PRESSURE TAP
	T - THERMOMETER		S - SAMPLE CONNECTION
	TC - THERMOCOUPLE		CONTROL FUNCTION LINE
	TCT - TEMPERATURE CONTROLLER		
	TS - TEMPERATURE SWITCH		
	TX - TEMPERATURE TRANSMITTER		
	RTD - RESISTANCE TEMPERATURE DETECTOR		

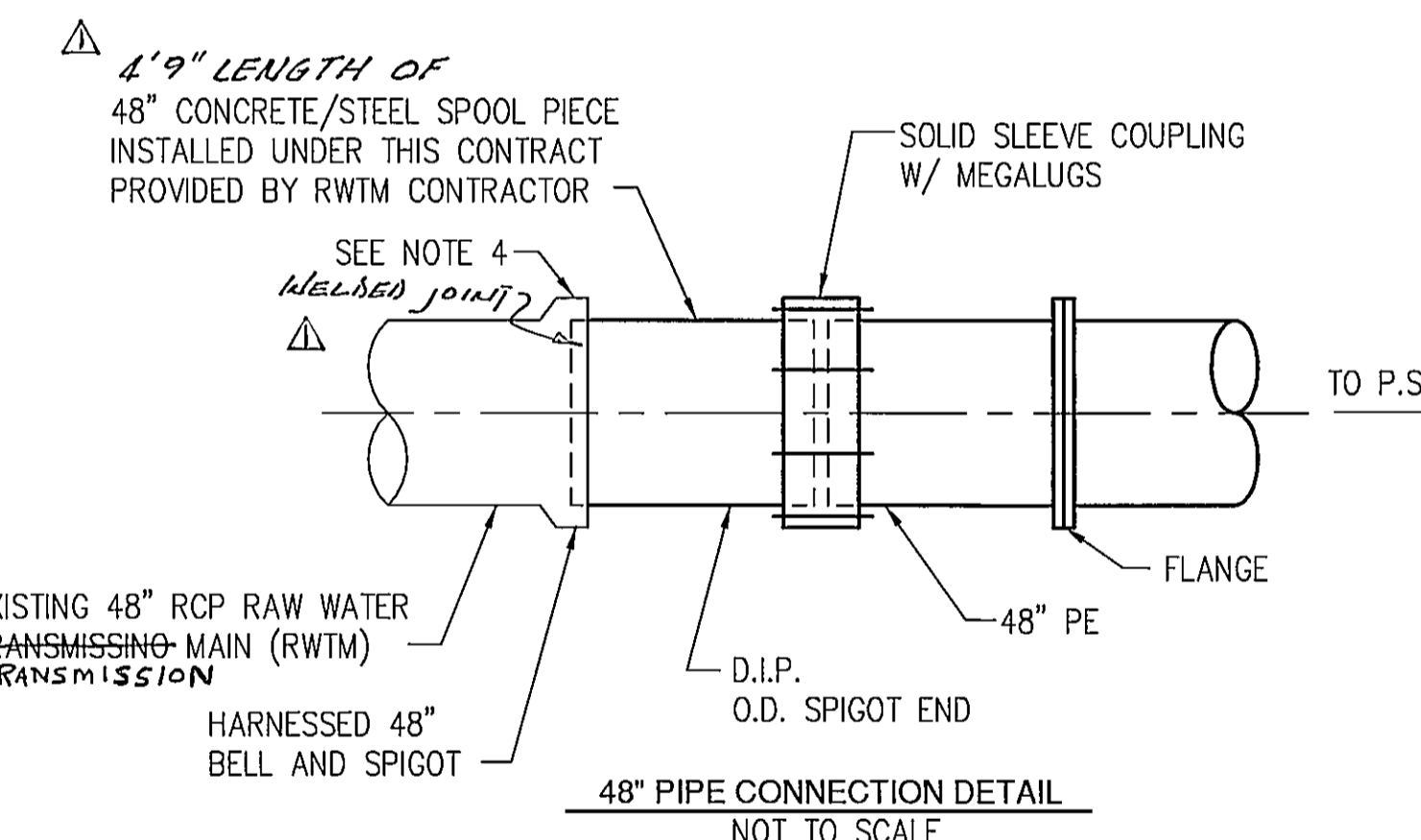
	CATV - CABLE TELEVISION		W - WATER
	G - GAS		FM - FORCE MAIN
	OE - OVERHEAD ELECTRIC		X-X-X - FENCE
	UE - UNDERGROUND ELECTRIC		---?--- - PROPERTY LINE
	S - SANITARY SEWER		--- - RIGHT OF WAY
	SS - STORM SEWER		--- - PERMANENT EASEMENT
	T - TELEPHONE		--- - SECTION LINE
	UT - UNDERGROUND TELEPHONE		--- - FIBER OPTIC

### NOTES:

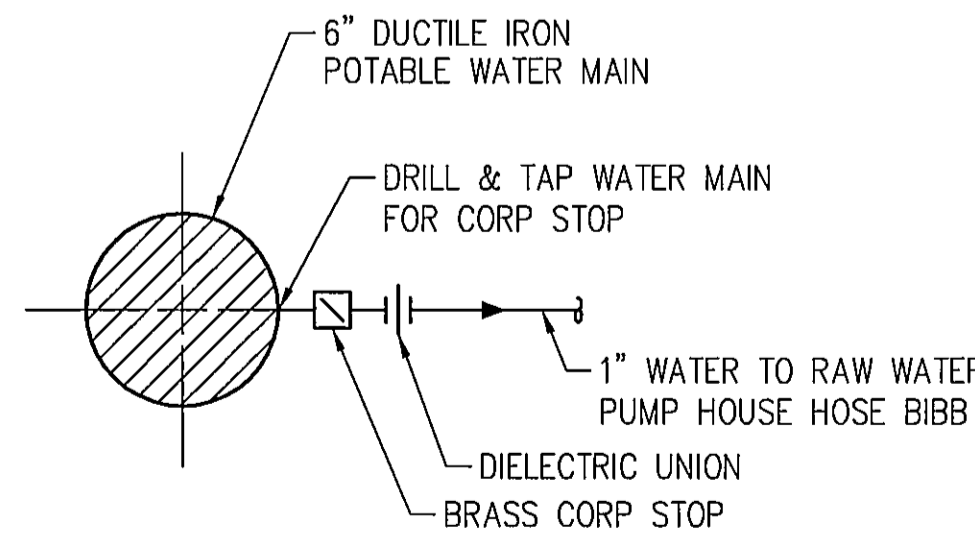
- THIS IS A STANDARD PROCESS LEGEND AND NOT ALL ITEMS OR EQUIPMENT AS DESIGNATED HEREON ARE USED ON THIS PROJECT.



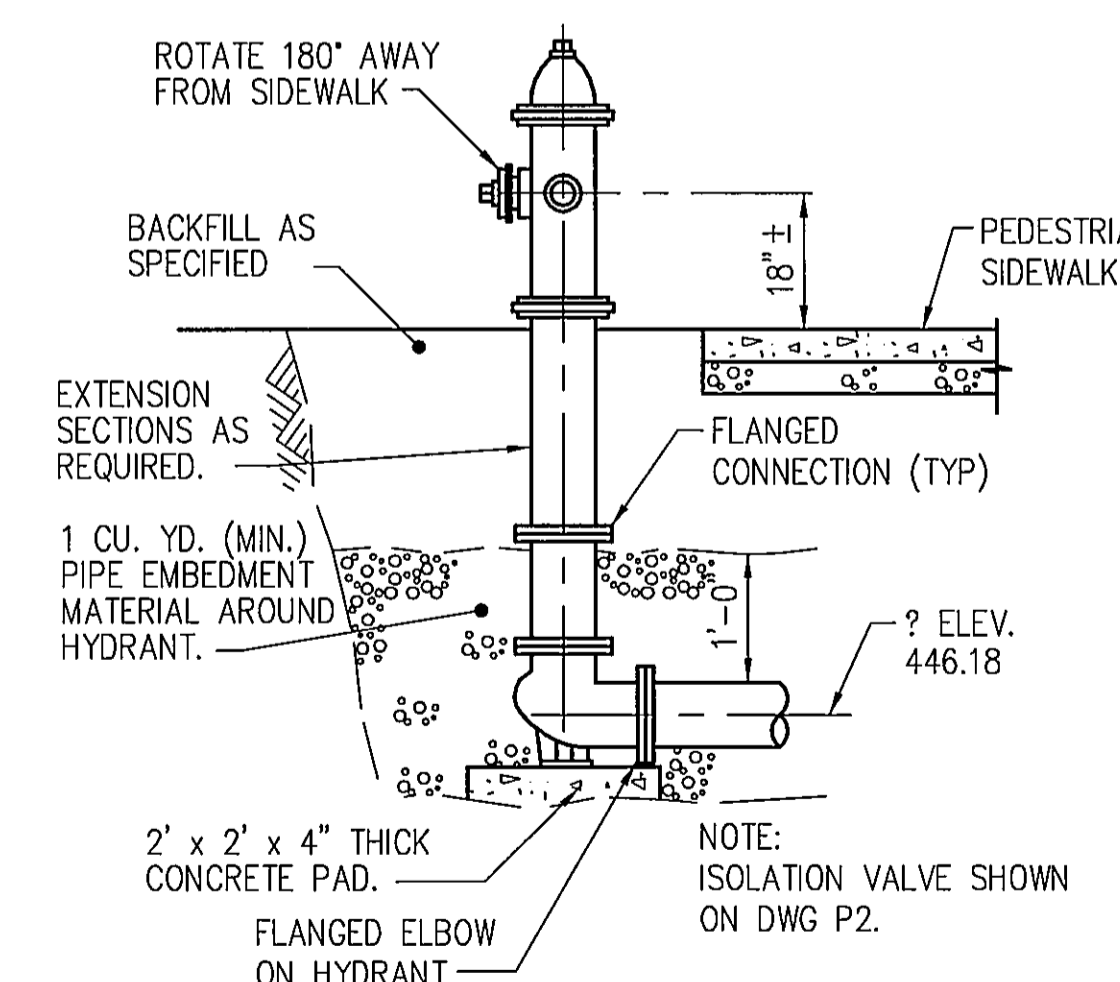
TYPICAL RAW WATER CONSTRUCTION ACCESS LIMITS NOT TO SCALE



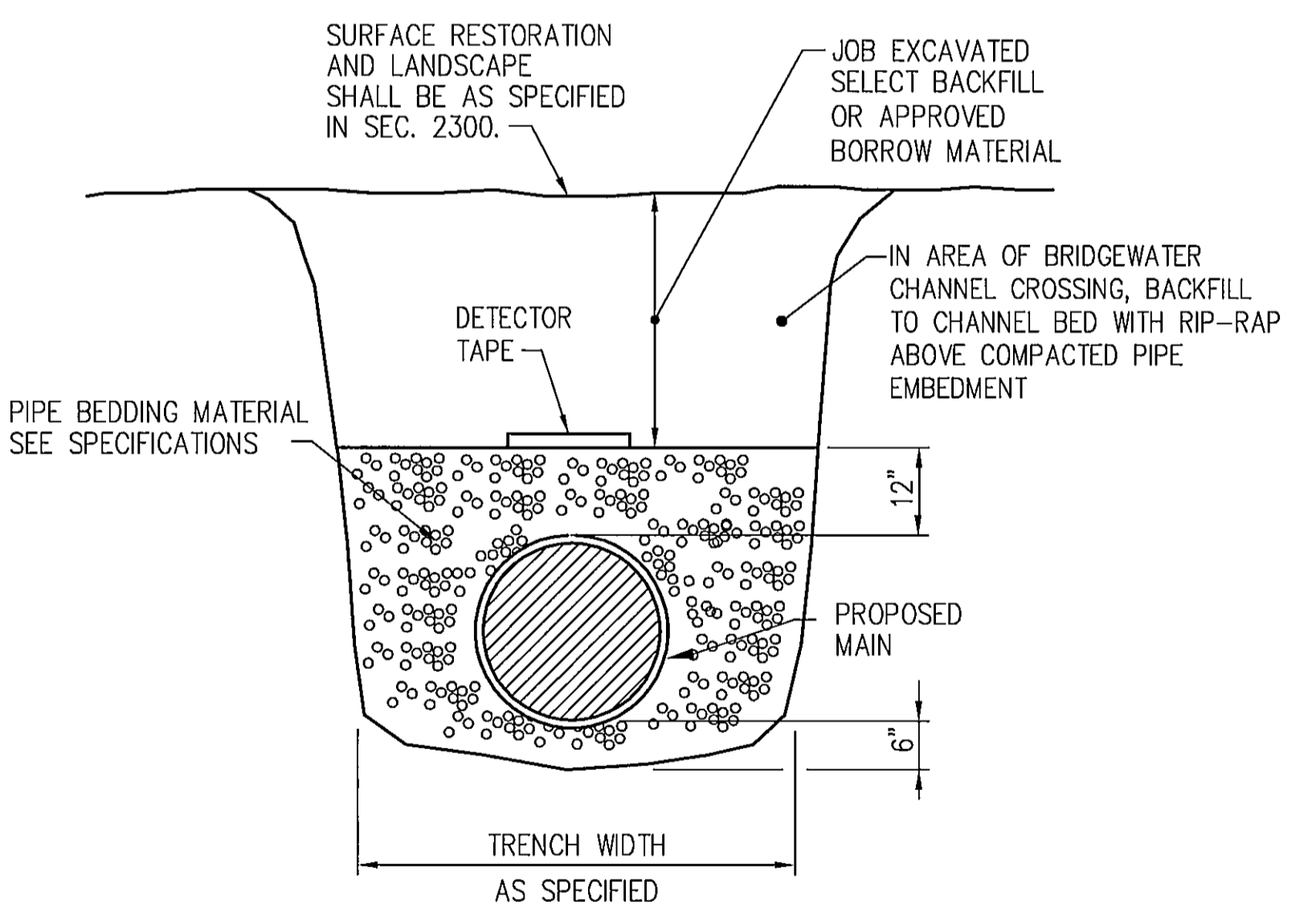
48" PIPE CONNECTION DETAIL NOT TO SCALE



POTABLE WATER CONNECTION DETAIL NOT TO SCALE



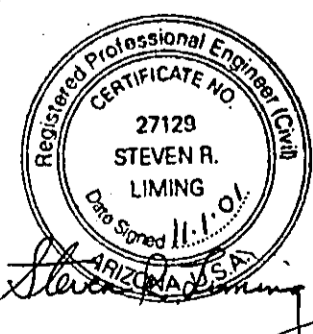
FIRE HYDRANT FH-1 DETAIL NOT TO SCALE



TYPICAL TRENCH DETAIL NOT TO SCALE

"AS-BUILT"

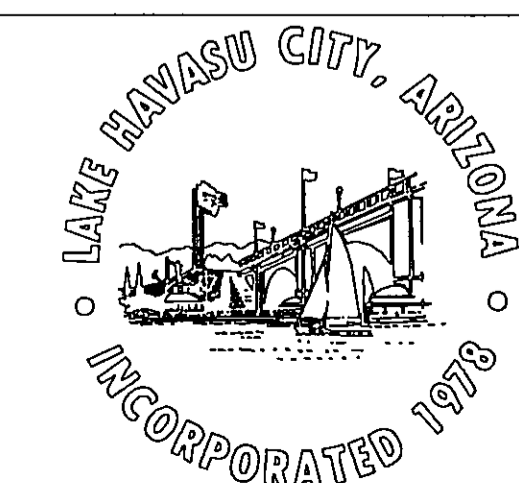
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no.	date	by	revision
1	8-15-01	JDF	MODIFIED 48" PIPE CONNECTION DETAIL.
2	8-15-01	JDF	AS-BUILT



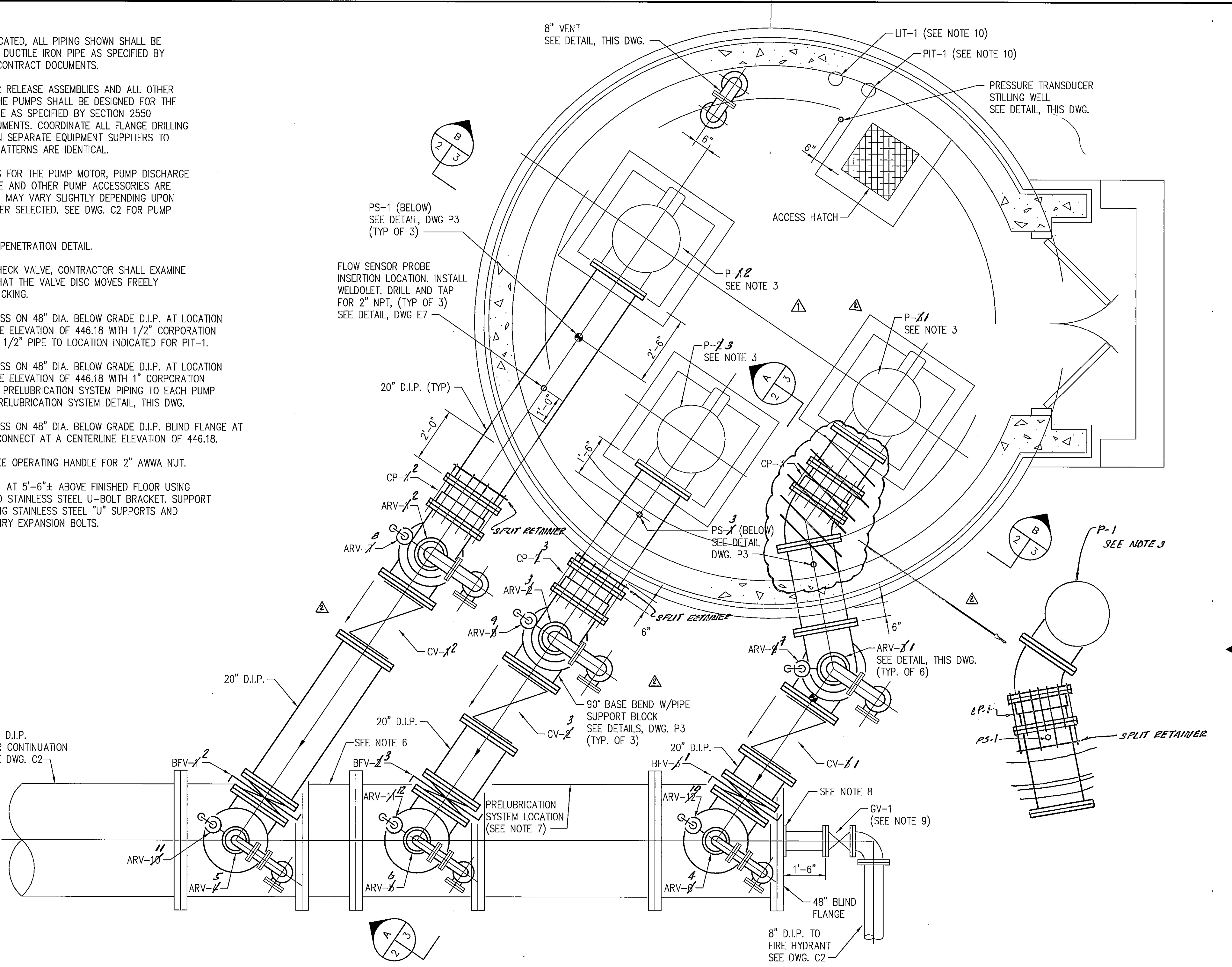
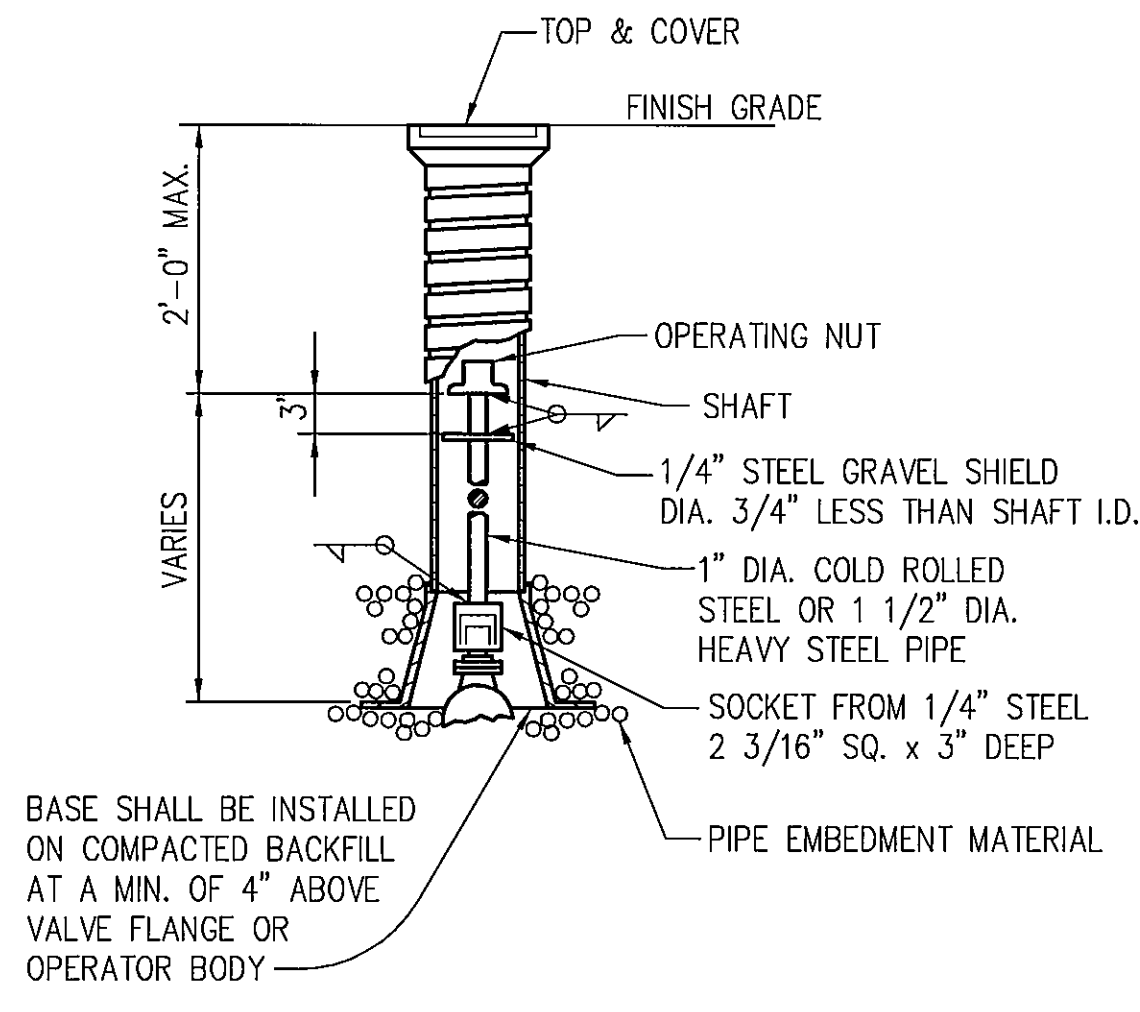
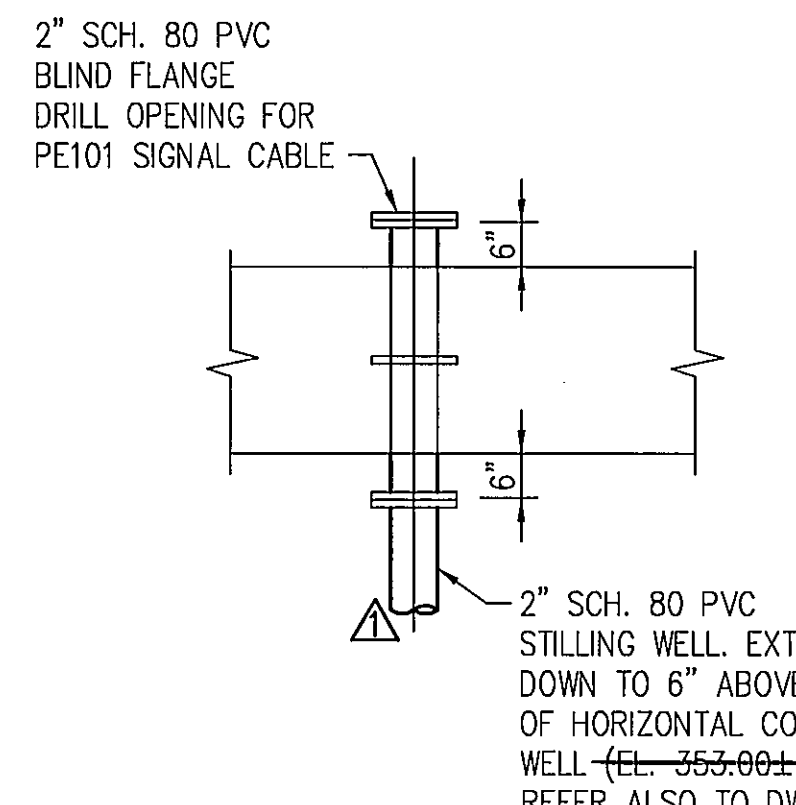
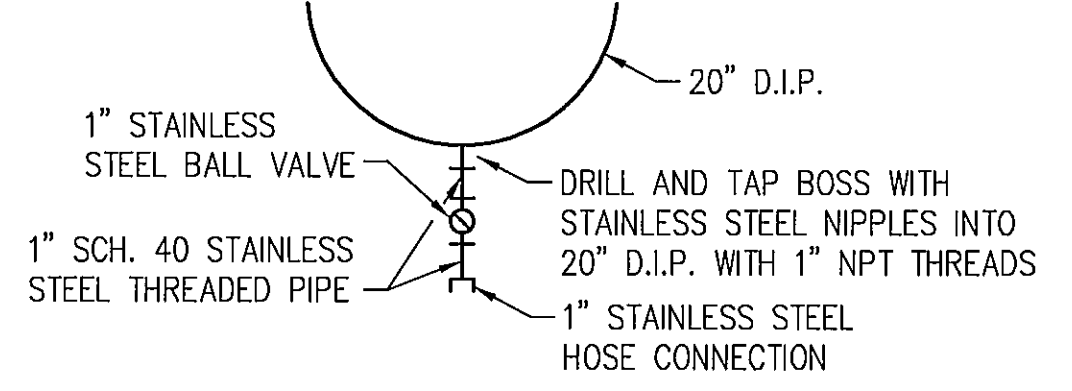
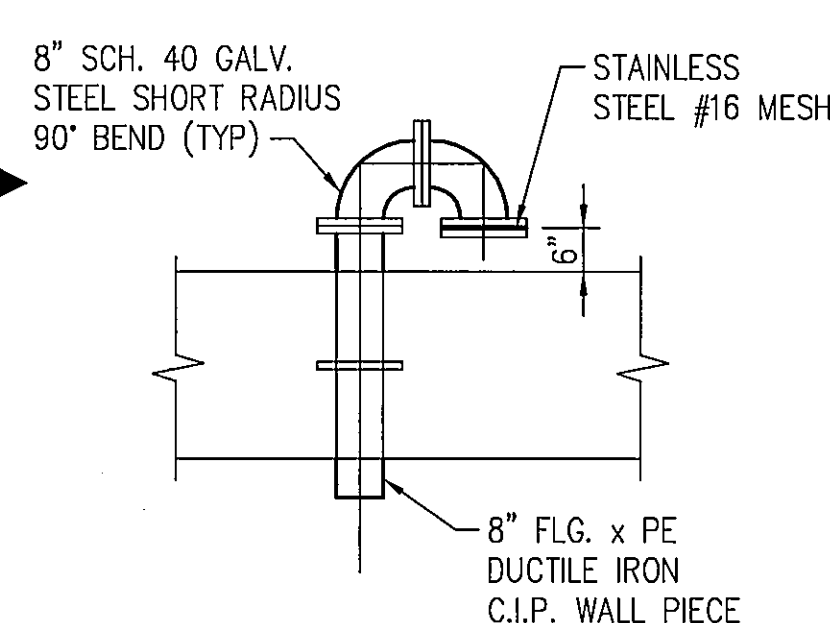
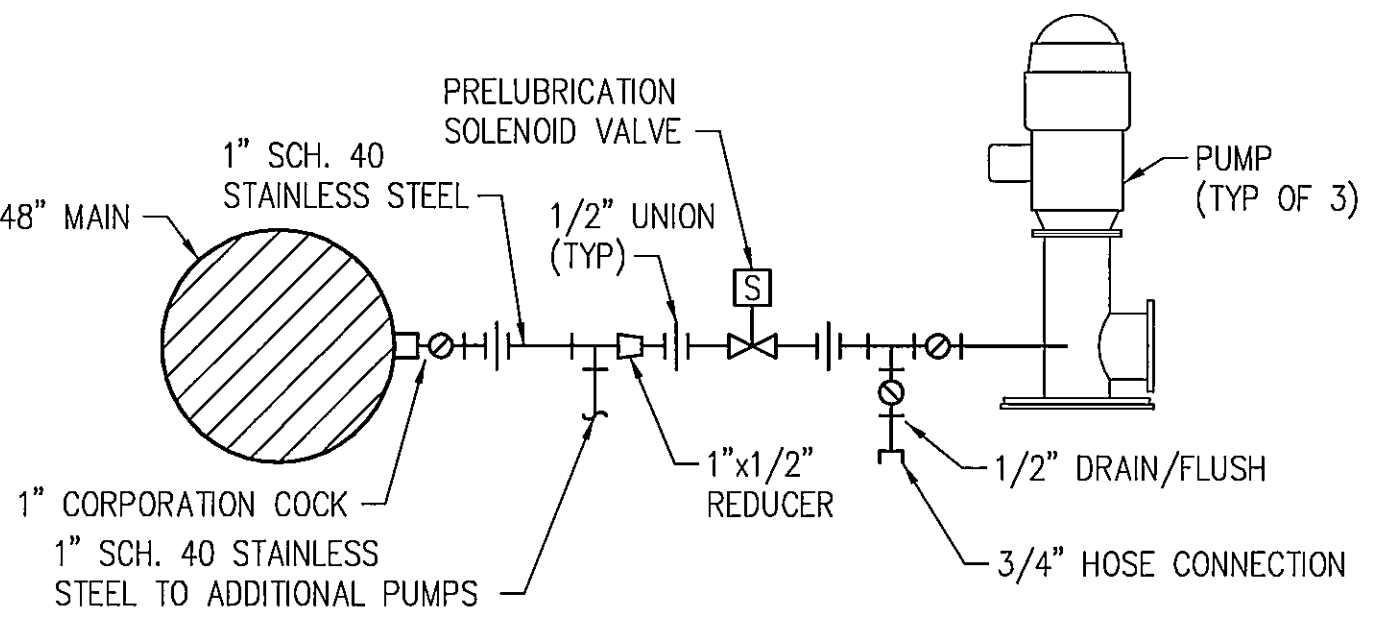
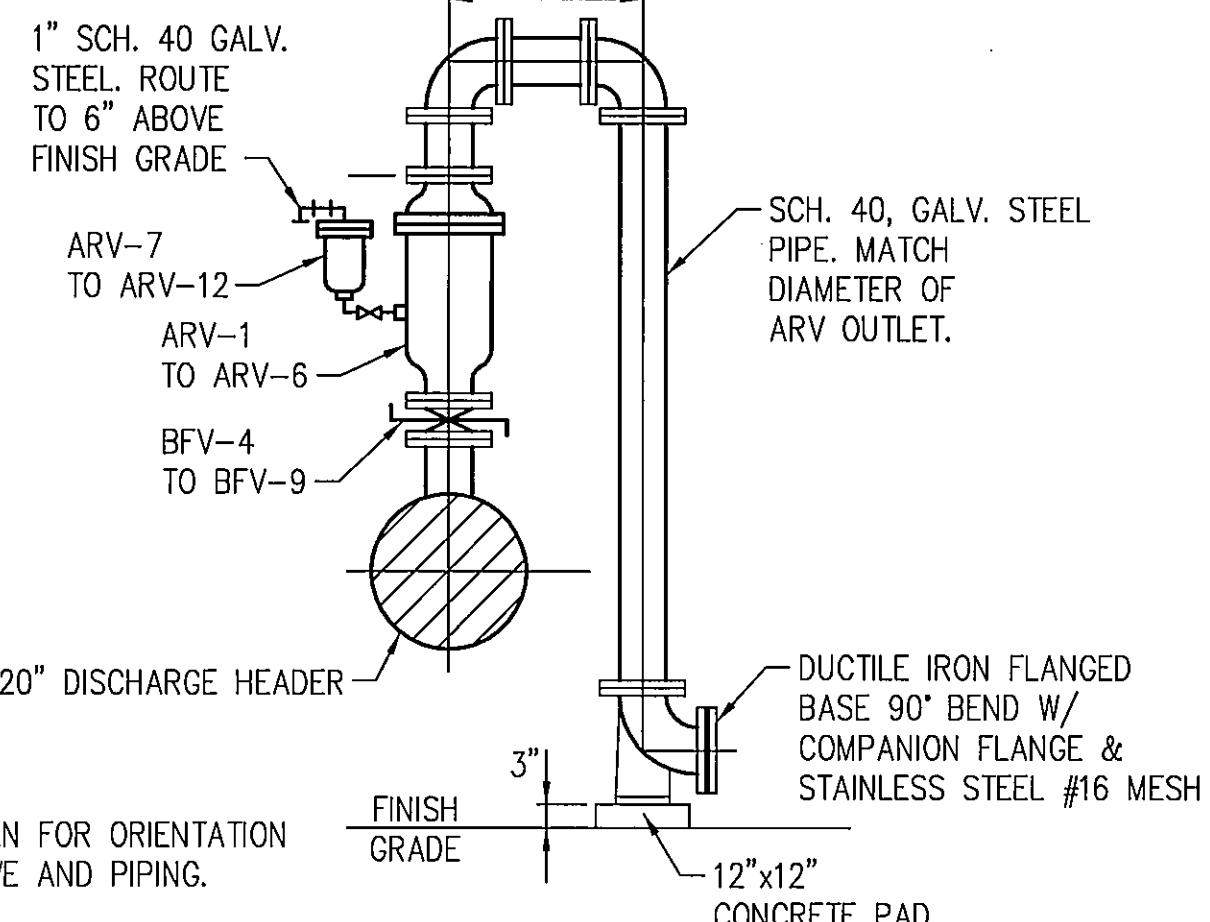
date	DEC. 7, 1999	detailed	G. PORTER
designed	T. CROWLEY	checked	J.L.S.



LONDON BRIDGE BEACH PUMP HOUSE	
PROCESS LEGEND	
project	97-777-1-002
contract	W-183-00
drawing	<b>P1</b>
sheet	g of 21 sheets
file	Lbbphp01.dwg 06-13-2000 15:19 LJM

**NOTES:**

- UNLESS OTHERWISE INDICATED, ALL PIPING SHOWN SHALL BE FLANGED MORTAR LINED DUCTILE IRON PIPE AS SPECIFIED BY SECTION 2550 OF THE CONTRACT DOCUMENTS.
- ALL PIPING, VALVES, AIR RELEASE ASSEMBLIES AND ALL OTHER APPURTENANCES FOR THE PUMPS SHALL BE DESIGNED FOR THE MAXIMUM TEST PRESSURE AS SPECIFIED BY SECTION 2550 OF THE CONTRACT DOCUMENTS. COORDINATE ALL FLANGE DRILLING PATTERN SIZES BETWEEN SEPARATE EQUIPMENT SUPPLIERS TO ENSURE THAT FLANGE PATTERNS ARE IDENTICAL.
- THE SCALED DIMENSIONS FOR THE PUMP MOTOR, PUMP DISCHARGE BASE, PUMP SOLE PLATE AND OTHER PUMP ACCESSORIES ARE APPROXIMATE ONLY AND MAY VARY SLIGHTLY DEPENDING UPON THE PUMP MANUFACTURER SELECTED. SEE DWG. C2 FOR PUMP LOCATION PLAN.
- SEE DWG. S4 FOR PIPE PENETRATION DETAIL.
- PRIOR TO INSTALLING CHECK VALVE, CONTRACTOR SHALL EXAMINE THE DISC TO ENSURE THAT THE VALVE DISC MOVES FREELY WITHOUT BINDING OR STICKING.
- DRILL AND TAP INTO BOSS ON 48" DIA. BELOW GRADE D.I.P. AT LOCATION SHOWN AT A CENTERLINE ELEVATION OF 446.18 WITH 1/2" CORPORATION COCK AND FIELD ROUTE 1/2" PIPE TO LOCATION INDICATED FOR PIT-1.
- DRILL AND TAP INTO BOSS ON 48" DIA. BELOW GRADE D.I.P. AT LOCATION SHOWN AT A CENTERLINE ELEVATION OF 446.18 WITH 1" CORPORATION COCK AND FIELD ROUTE PRELUBRICATION SYSTEM PIPING TO EACH PUMP IN ACCORDANCE WITH PRELUBRICATION SYSTEM DETAIL, THIS DWG.
- DRILL AND TAP INTO BOSS ON 48" DIA. BELOW GRADE D.I.P. BLIND FLANGE AT LOCATION SHOWN AND CONNECT AT A CENTERLINE ELEVATION OF 446.18.
- PROVIDE OWNER WITH TEE OPERATING HANDLE FOR 2" AWWA NUT.
- MOUNT LIT-1 AND PIT-1 AT 5'-6"± ABOVE FINISHED FLOOR USING ALUMINUM CHANNEL AND STAINLESS STEEL U-BOLT BRACKET. SUPPORT OFF BUILDING WALL USING STAINLESS STEEL "U" SUPPORTS AND STAINLESS STEEL MASONRY EXPANSION BOLTS.



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

A B C D E F G H I J

Scale For Micrometers

Scale For Inches

Scale For Feet

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no.	date	by	revision
Δ	7-27-01	JJM	REVISE DRAWING TO ACCOMMODATE COLLECTOR WELL "AS BUILT"
Δ	8-15-01	JDF	DELETED ELEM, MODIFIED P-1, REVISED PUMP NUMBERS & ASSOCIATED EQUIPMENT.
	8-15-01	JDF	As-Built

date NOV. 9, 1999  
designed T. CROWLEY

detailed G. PORTER  
checked J.L.S.

SCALE IN FEET

NORTH

**"AS-BUILT"**

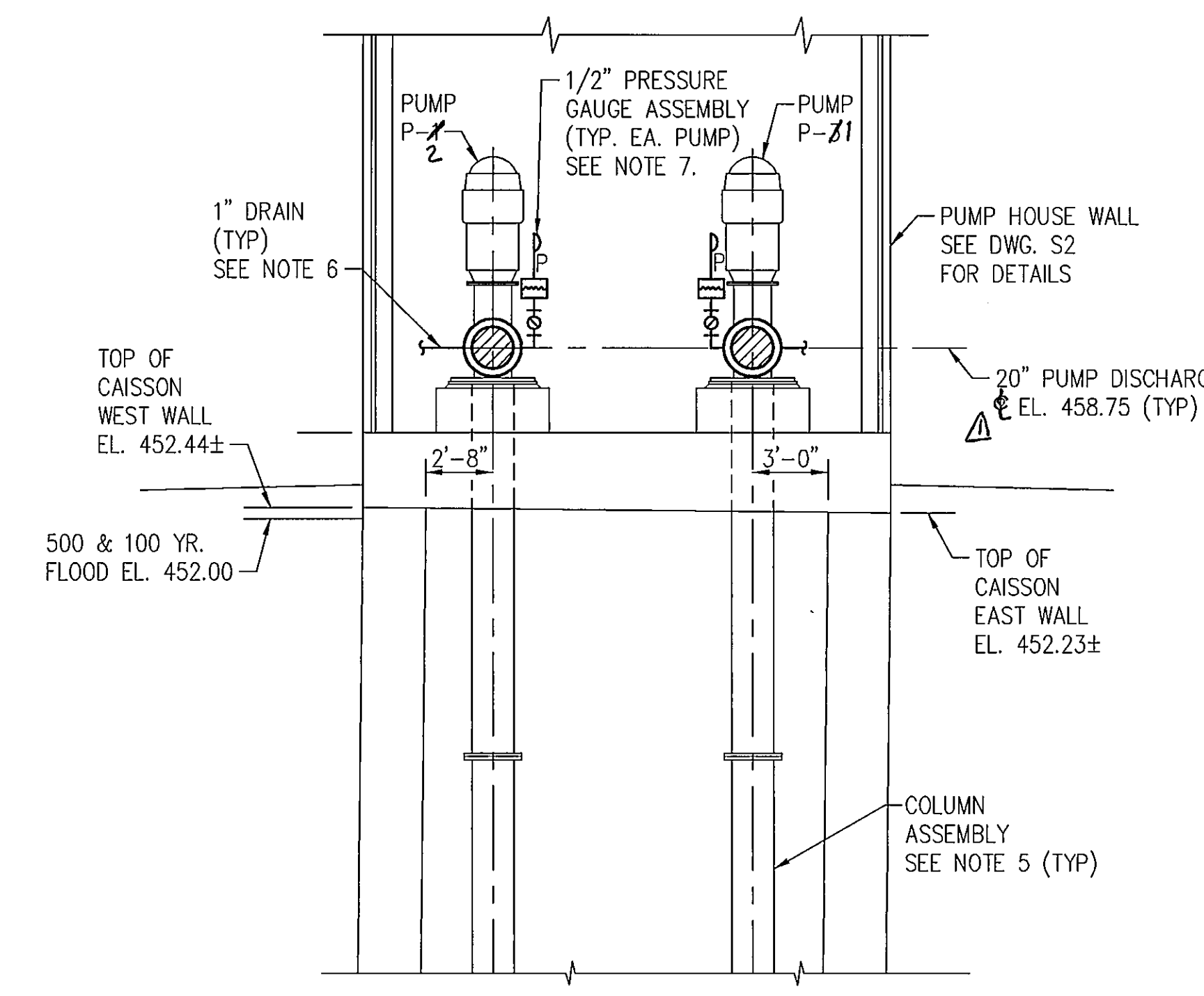
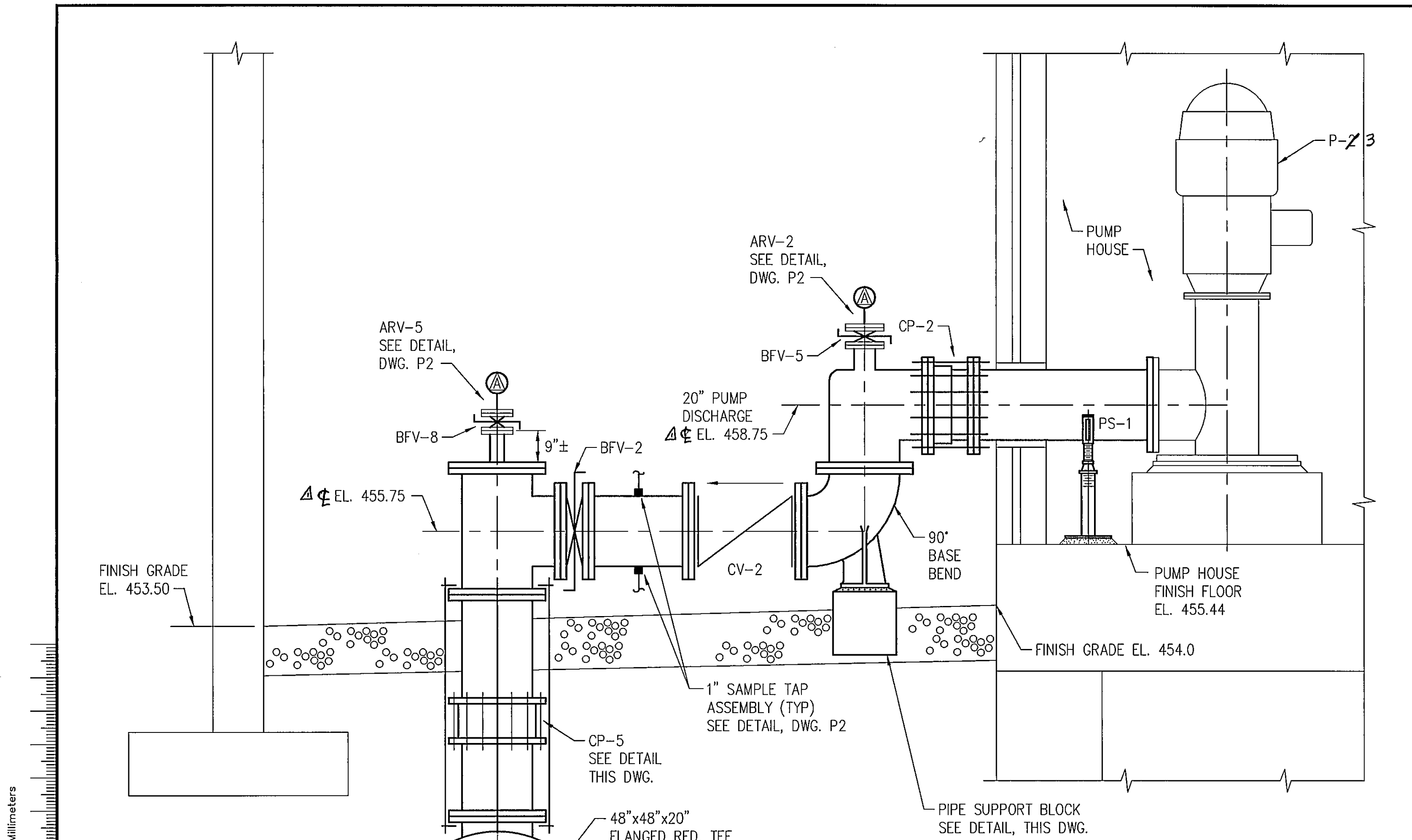
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**LONDON BRIDGE BEACH PUMP HOUSE**

PARTIAL PLAN AND DETAILS

project 97-777-1-002	contract W-183-00
drawing <b>P2</b>	rev. <b>12</b>
sheet 10 of 21 sheets	file Lbbphp02.dwg 03-20-2000 16:02 LJM

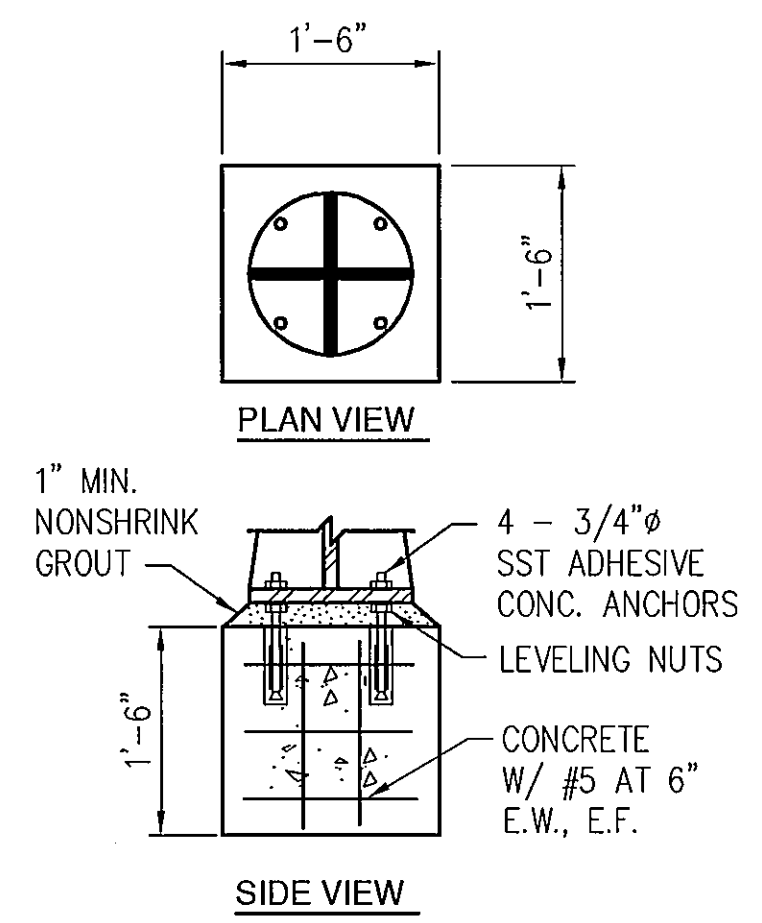
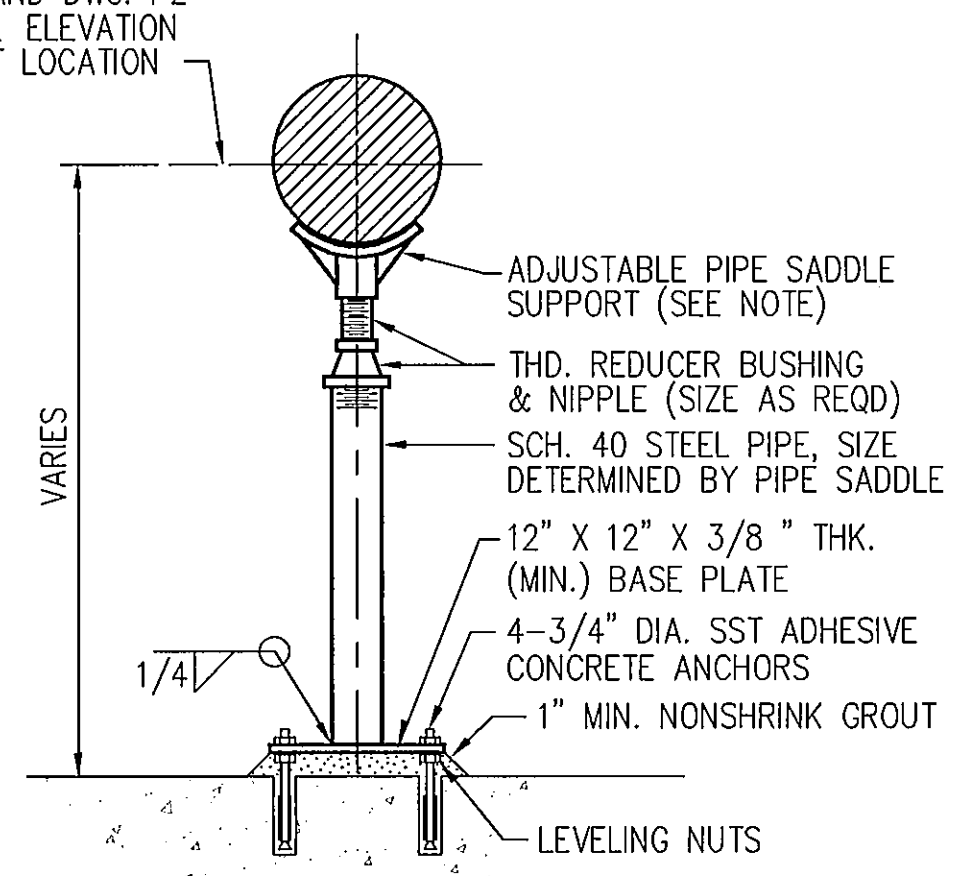
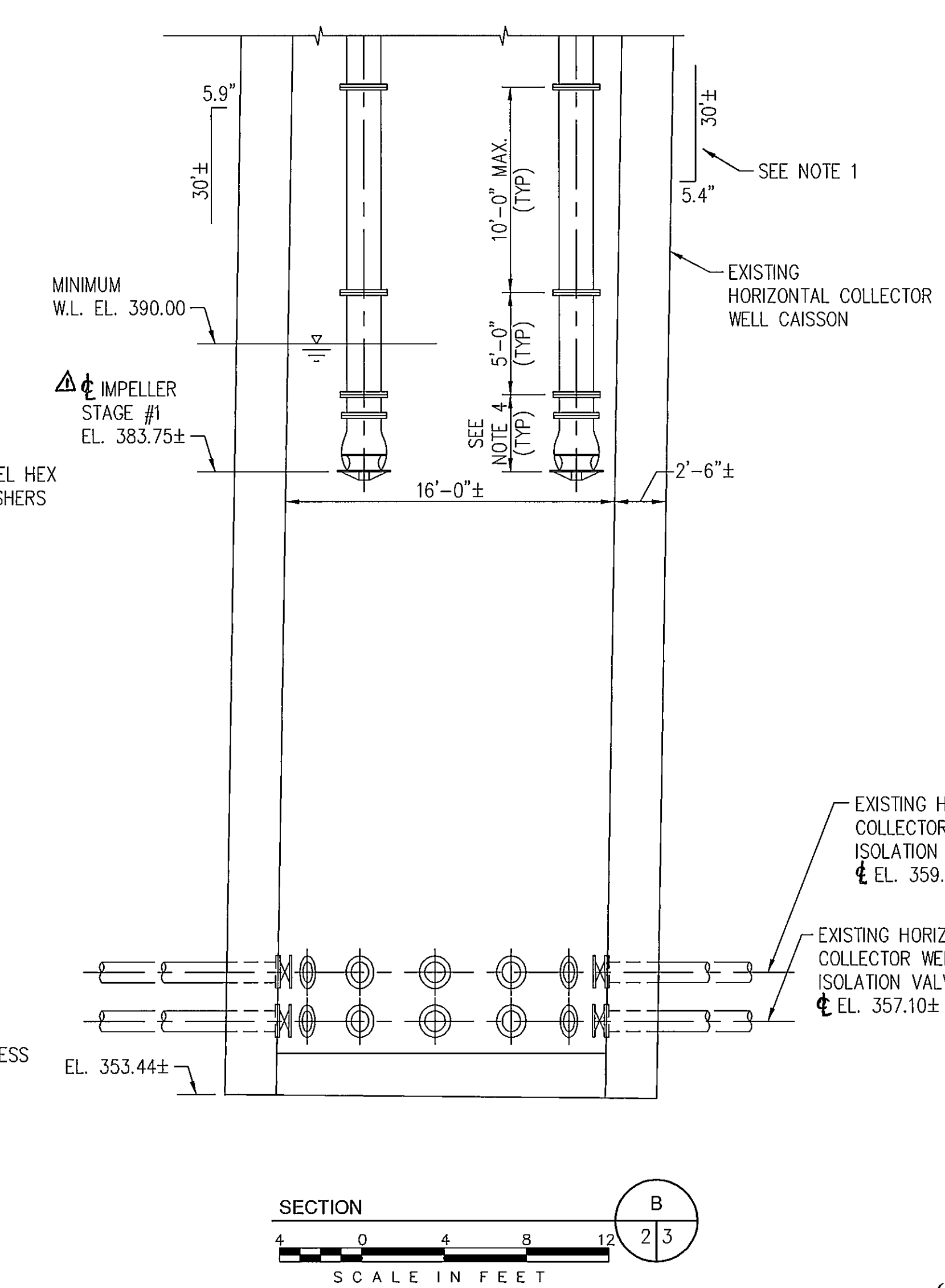
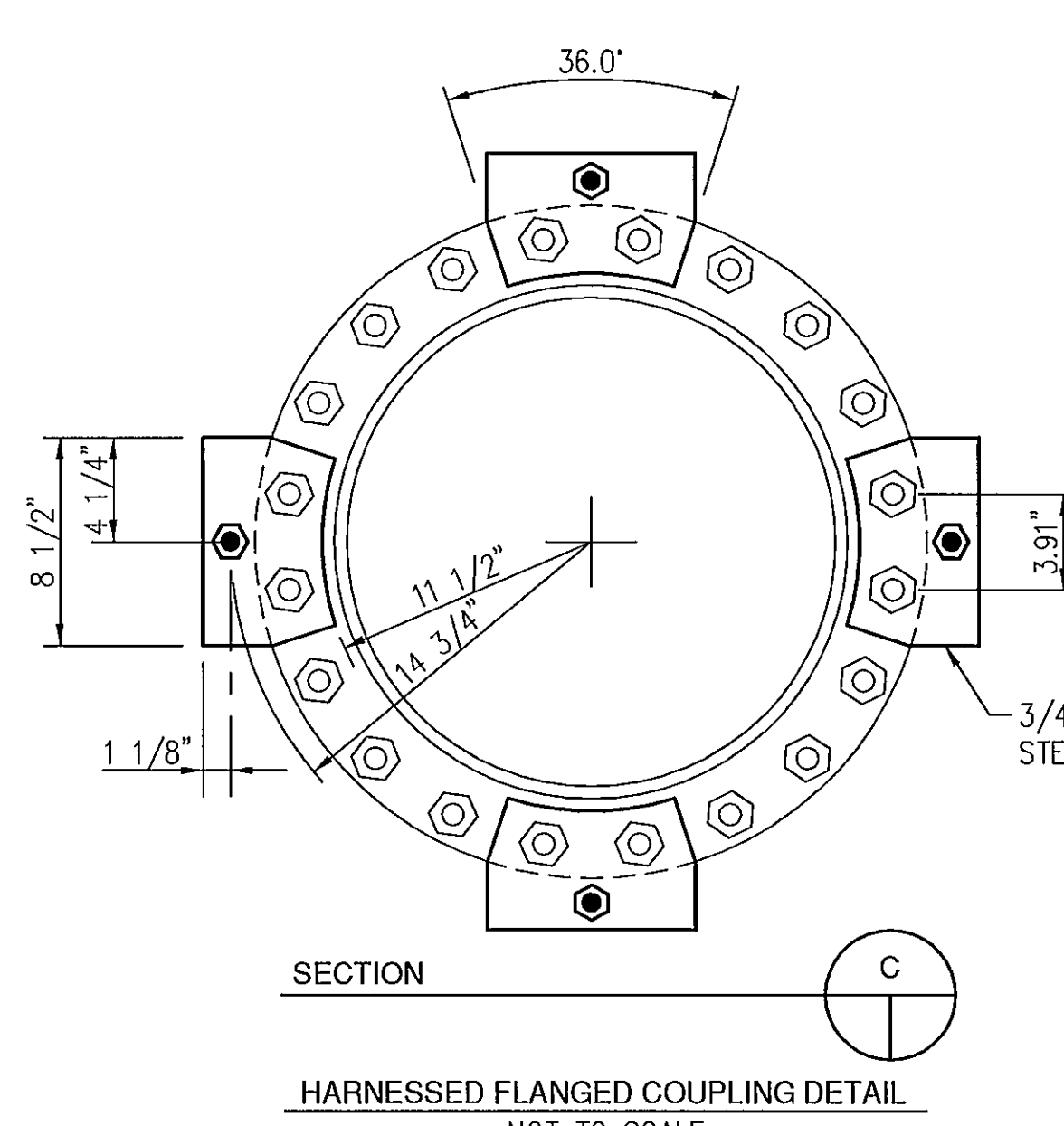
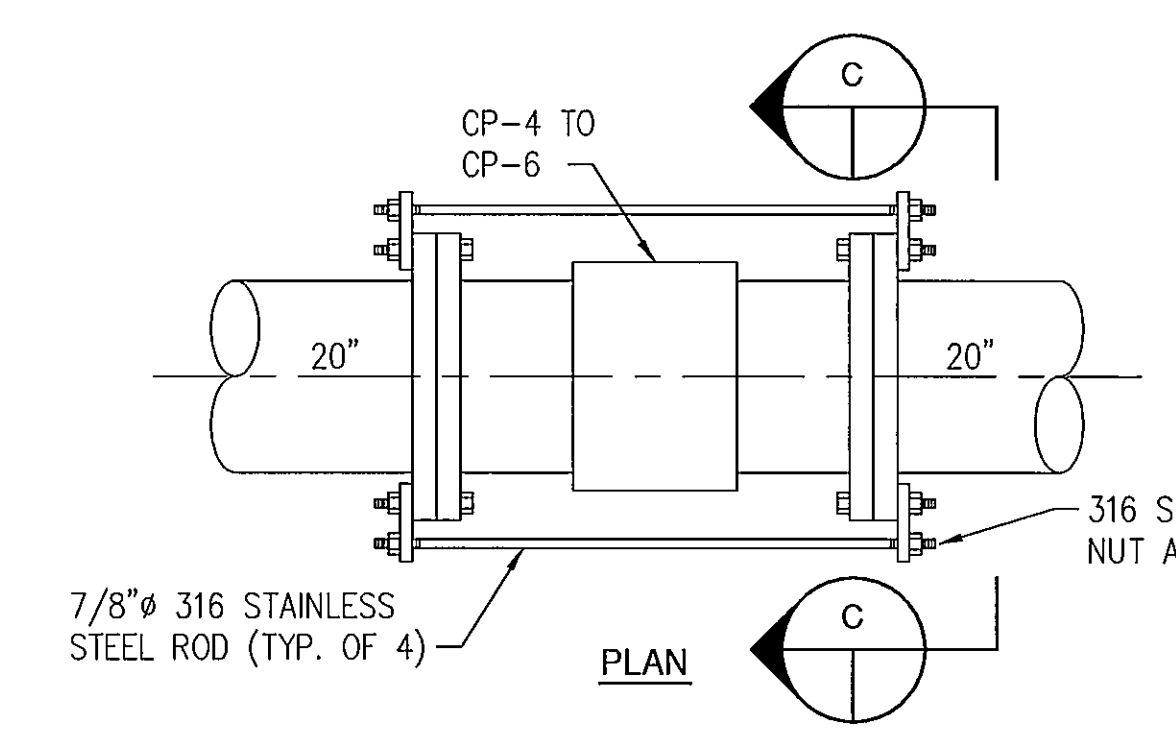
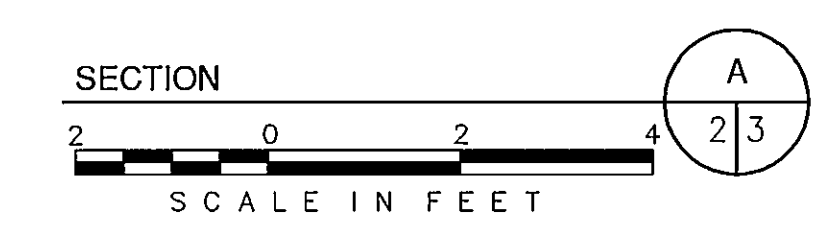


- NOTES:**
- PRIOR TO PROCEEDING WITH WORK, CONTRACTOR SHALL VERIFY SLOPES OF EAST AND WEST CAISSON WORK. ANY DISCREPANCY BETWEEN THE MEASURED VALUES AND THOSE INDICATED SHOULD BE REPORTED TO OWNER'S FIELD REPRESENTATIVE.
  - FOR THE SAKE OF CLARITY NOT ALL PIPING AND EQUIPMENT IS SHOWN.
  - PUMP PAD ELEVATION SHALL BE A MINIMUM OF 6" ABOVE PUMP STATION FINISHED FLOOR. PROVIDE 1"-2" OF GROUT TO ACHIEVE DISCHARGE CENTERLINE ELEVATION AS INDICATED.
  - DIMENSIONS OF BOWL ASSEMBLY AND QUANTITY OF STAGES VARY BETWEEN PUMP MANUFACTURERS.
  - PROVIDE SUFFICIENT FLANGED JOINTS ON INSIDE OF PUMP DISCHARGE COLUMN TO AVOID FIELD WELDING. PUMP MANUFACTURER TO DETERMINE EXACT LOCATION AND LENGTHS OF COLUMN ASSEMBLY SUBJECT TO APPROVAL BY ENGINEER.
  - CONNECT 1" SCH. 40 STAINLESS STEEL PIPE TO SEAL WATER DRAIN CONNECTION, DROP TO PUMP FINISHED FLOOR AND FIELD ROUTE TO NEAREST FLOOR DRAIN. AVOID TRAFFIC AREAS WHERE POSSIBLE AND CLAMP TO FLOOR USING STAINLESS STEEL HARDWARE. SEE DRAWING M2 FOR LOCATION OF FLOOR DRAINS.
  - PRESSURE GAUGE ASSEMBLIES SHALL CONSIST OF PRESSURE GAUGE, GAUGE SEAL, STAINLESS STEEL ISOLATION VALVE AND STAINLESS STEEL TUBING.

Scale For Micrometers

Scale For Micrometers

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**NOTE:**  
WHERE PIPE SUPPORT IS INDICATED TO BE LOCATED UNDER VALVE, PROVIDE ADJUSTABLE PLATE SUPPORT IN LIEU OF SADDLE SUPPORT.

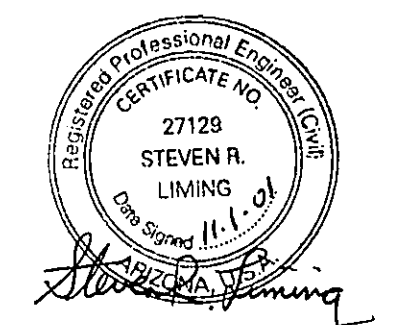
**PS-1**  
**PIPE SUPPORT DETAIL**  
NOT TO SCALE

**PIPE SUPPORT BLOCK DETAIL**  
NOT TO SCALE

**SECTION C**  
**HARNESSES FLANGED COUPLING DETAIL**  
NOT TO SCALE

**"AS-BUILT"**

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(OUTSIDE MARICOPA COUNTY)



no.	date	by	revision
1	8-15-01	JDF	AS-BUILT



date NOV. 9, 1999 detailed G. PORTER  
designed T. CROWLEY checked J.L.S.



LONDON BRIDGE BEACH PUMP HOUSE	
SECTIONS AND DETAILS	
project 97-777-1-002	contract W-183-00
drawing <b>P3</b>	rev. /
sheet 11 of 21 sheets	
file Lbbphp03.dwg	06-13-2000 15:06 LJM

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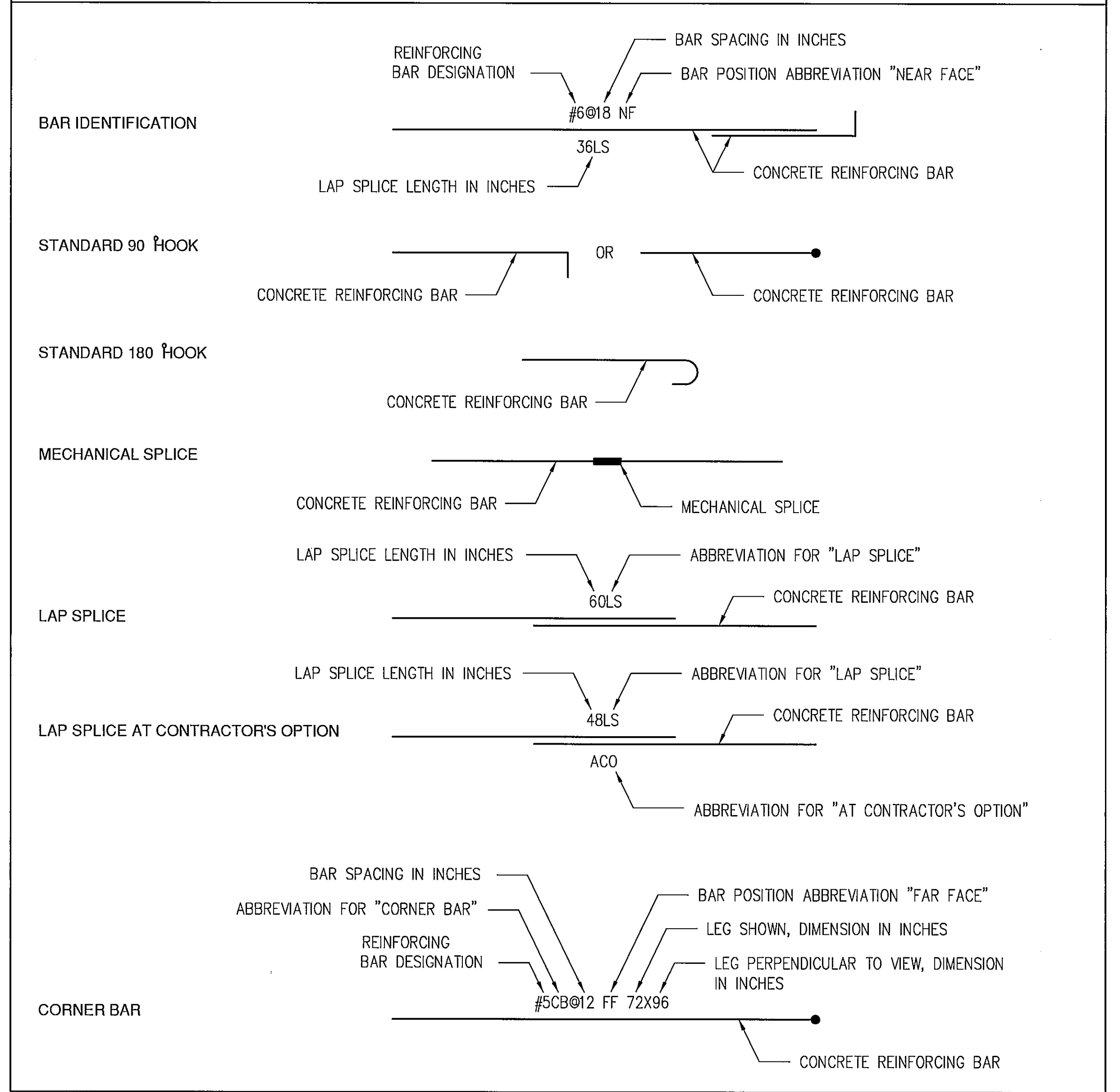
### ABBREVIATIONS

AA	ALUMINUM ASSOCIATION	EQL	EQUAL	OF	OUTER FACE	&	AND
AASHTO	AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS	EQL SP	EQUALLY SPACED	OPNG	OPENING	±	APPROXIMATELY
AB	ANCHOR BOLT	EQPT	EQUIPMENT	OPP	OPPOSITE	@	AT
ABT	ABOUT	EQUIV	EQUIVALENT	OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION	x	BY
ACI	AMERICAN CONCRETE INSTITUTE	EW	EACH WAY	P <sub>a</sub>	PASCAL	⊕	CENTERLINE
ACO	AT CONTRACTOR'S OPTION	EXP	EXPANSION	PCA	PORTLAND CEMENT ASSOCIATION	∅	DIAMETER
ADH	ADHESIVE	EXST	EXISTING	PCF	POUNDS PER CUBIC FOOT	=	EQUAL
AHR	ANCHOR	EXT	EXTERIOR	PCI	PRESTRESSED CONCRETE INSTITUTE	>	GREATER THAN
AHU	AIR HANDLING UNIT	FD	FLOOR DRAIN	PEDESTAL	PEDESTAL	<	LESS THAN
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION	FF	FAR FACE	PJTIN	PROJECTION	#	NUMBER, POUND
AISI	AMERICAN IRON AND STEEL INSTITUTE	FL	FLOOR	PL	PLATE, PROPERTY LINE	%	PERCENT
AL, ALUM	ALUMINUM	FLG	FLANGE	PLCS	PLACES	⊓	PLATE, PROPERTY LINE
ALTN	ALTERNATE	f <sub>c</sub>	ULTIMATE COMPRESSIVE STRENGTH OF CONCRETE	PLF	POUNDS PER LINEAR FOOT		
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE	f <sub>m</sub>	ULTIMATE COMPRESSIVE STRENGTH OF MASONRY	PSF	POUNDS PER SQUARE FOOT		
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS	FNH	FINISH	PSI	POUNDS PER SQUARE INCH		
APPROX	APPROXIMATE	FRP	FIBERGLASS REINFORCED PLASTIC	PRV	PRESSURE RELIEF VALVE		
ARCH	ARCHITECTURAL	fs	PERMISSIBLE STEEL STRESS	PT	POINT		
AWS	AMERICAN WELDING SOCIETY	FS	FAR SIDE	PVC	POLYVINYL CHLORIDE		
BM	BEAM	FT	FEET, FOOT	PWS	PLASTIC WATERSTOP		
BETW	BETWEEN	F <sub>y</sub> , f <sub>y</sub>	YIELD STRESS	R	RISERS		
BO	BOTTOM OF	GA	GAGE, GAUGE	RAD	RADIUS		
BOT	BOTTOM	GAL	GALLON	RD	ROOF DRAIN		
BOS	BOTTOM OF STEEL	GALV	GALVANIZED	REF	REFERENCE		
BRG	BEARING	GRTG	GRATING	REINF	REINFORCEMENT		
CAP	CAPACITY	GS	GRATING SUPPORT	REQD	REQUIRED		
CB	CORNER BAR	H	HIGH	RJ	ROUGHENED JOINT		
CC	CLEAR COVER	HEX	HEXAGON	R	ROOF DRAIN		
CE	CONCRETE EDGE	HK	HOOK	RD	ROOF DRAIN		
CGF	COMPACTED GRANULAR FILL	HNDRL, HR	HANDRAIL	REF	REFERENCE		
CHKR	CHECKERED	HORIZ	HORIZONTAL	REINF	REINFORCEMENT		
CIRC	CIRCULAR	HP	HORSEPOWER	REQD	REQUIRED		
CIS	CENTERED IN SLAB	HPT	HIGH POINT	RJ	ROUGHENED JOINT		
CIW	CENTERED IN WALL	HS	HIGH STRENGTH	R	RISERS		
CJ	CONSTRUCTION JOINT	HVAC	HEATING, VENTILATION, AND AIR CONDITIONING	RD	ROOF DRAIN		
CLJ	CONTROL JOINT	IF	INNER FACE	REF	REFERENCE		
CLR	CLEAR	INVT	INVERT	REINF	REINFORCEMENT		
CM	CENTIMETER	IJ	ISOLATION JOINT	REQD	REQUIRED		
CMU	CONCRETE MASONRY UNIT	JT	JOINT	RJ	ROUGHENED JOINT		
CO	CONCRETE OPENING	K	KIP	R	RISERS		
COL	COLUMN	kg	KILOGRAM	RD	ROOF DRAIN		
CONC	CONCRETE	kN	KILONEWTON	REF	REFERENCE		
CONN	CONNECTION	KSF	KIPS PER SQUARE FOOT	REINF	REINFORCEMENT		
CONSTR	CONSTRUCTION	KSI	KIPS PER SQUARE INCH	REQD	REQUIRED		
CONT	CONTINUOUS	L	ANGLE, LADDER	RJ	ROUGHENED JOINT		
COR	CORNER	LB	POUND	R	RISERS		
CRSI	CONCRETE REINFORCING STEEL INSTITUTE	LG	LENGTH, LONG	REF	REFERENCE		
CTR	CENTER	LLH	LONG LEG HORIZONTAL	REINF	REINFORCEMENT		
CWB	CAPILLARY WATER BARRIER	LLV	LONG LEG VERTICAL	REQD	REQUIRED		
CY	CUBIC YARD	LLO	LONG LEG OUTSTANDING	RJ	ROUGHENED JOINT		
db	BAR DIAMETER	LONG	LONGITUDINAL	R	RISERS		
DGA	DENSE GRADED AGGREGATE	LP	LOW POINT	REF	REFERENCE		
D.I.	DUCTILE IRON	LS	LAP SPLICE	REINF	REINFORCEMENT		
DIA	DIAMETER	M	METER	REQD	REQUIRED		
DIAG	DIAGONAL	MATL	MATERIAL	RJ	ROUGHENED JOINT		
DIM	DIMENSION	MAX	MAXIMUM	R	RISERS		
DT	DOUBLE TEE	MECH	MECHANICAL	REF	REFERENCE		
DWG	DRAWING	MEZZ	MEZZANINE	REINF	REINFORCEMENT		
DWL	DOWEL	MFR	MANUFACTURE(R)	REQD	REQUIRED		
E	EAST	MH	MANHOLE	RJ	ROUGHENED JOINT		
EA	EACH	MIN	MINIMUM	R	RISERS		
ED	EQUIPMENT DRAIN	MJ	MECHANICAL JOINT	REF	REFERENCE		
EF	EACH FACE	MM	MILLIMETER	REINF	REINFORCEMENT		
EJ	EXPANSION JOINT	MPa	MEGAPASCAL	REQD	REQUIRED		
EL	ELEVATION	N	NORTH	RJ	ROUGHENED JOINT		
ELEC	ELECTRICAL	NE	NORTHEAST	R	RISERS		
EMBED	EMBEDMENT	NF	NEAR FACE	REF	REFERENCE		
EP	EQUIPMENT PAD	NO	NUMBER	REINF	REINFORCEMENT		
		NOM	NOMINAL	REQD	REQUIRED		
		NS	NEAR SIDE	RJ	ROUGHENED JOINT		
		NTS	NOT TO SCALE	R	RISERS		
		NW	NORTHWEST	REF	REFERENCE		
		OC	ON CENTER	REINF	REINFORCEMENT		
				REQD	REQUIRED		

### MATERIALS LEGEND

	ALUMINUM
	CHECKERED PLATE
	CONCRETE
	CONCRETE MASONRY UNITS
	EARTH
	GRANULAR FILL
	GRATING
	GROUT
	ROCK
	STEEL (LARGE SCALE)
	WATER
	EXPANSION MATERIAL
	FASTENERS
	REINFORCING BARS
	STRUCTURAL STEEL (SMALL SCALE)

### CONCRETE REINFORCING BAR NOMENCLATURE



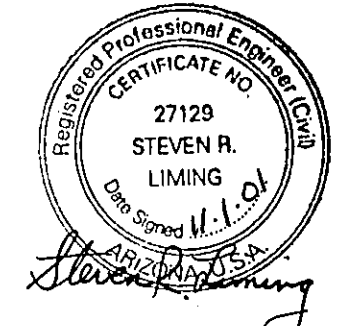
no.	date	by	revision
1	8-15-01	JDF	AS-BUILT



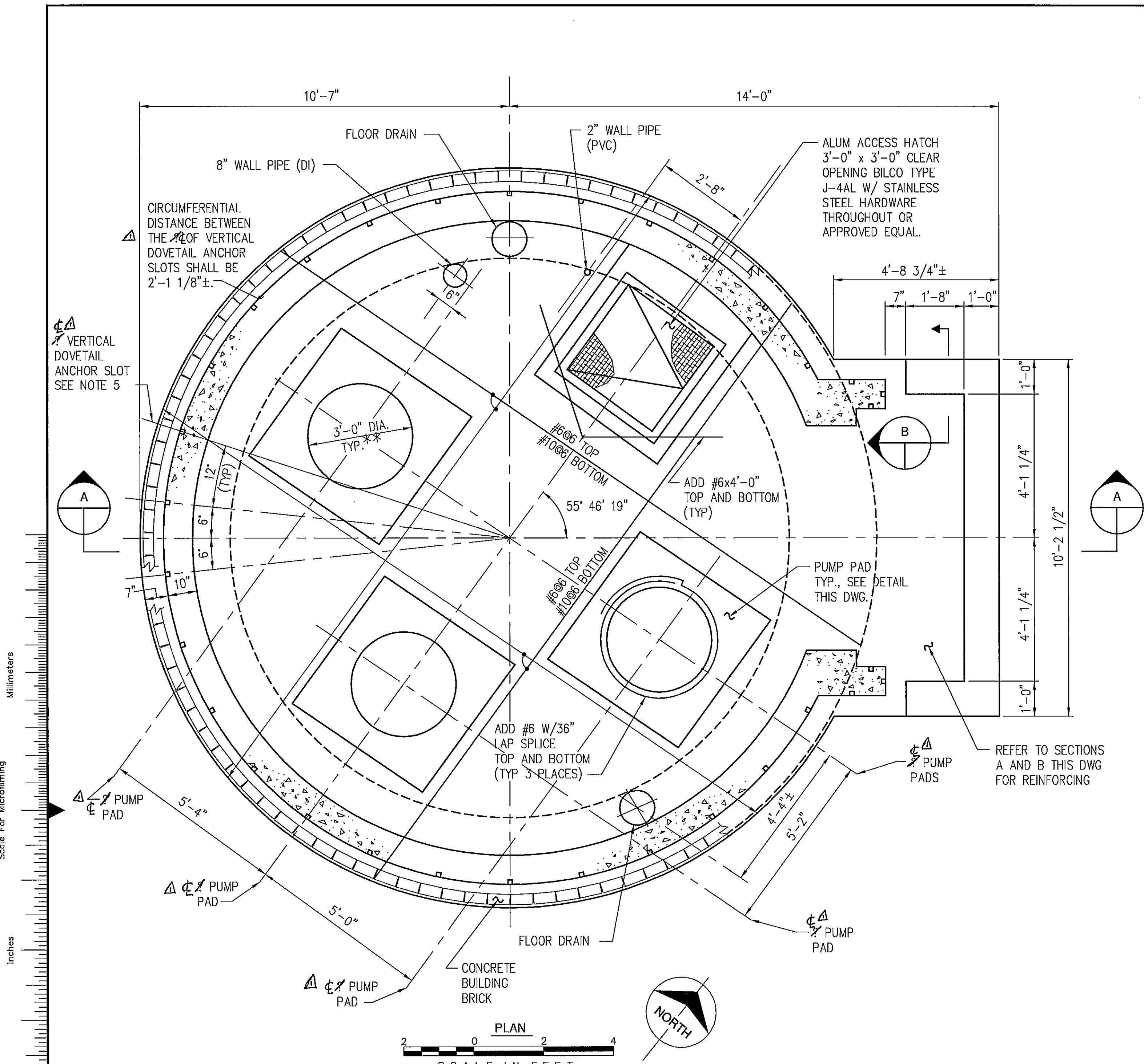
date	NOV. 10, 1999	detailed	J. ROUTON
designed	L. BUCK	checked	B.B.

“AS-BUILT”

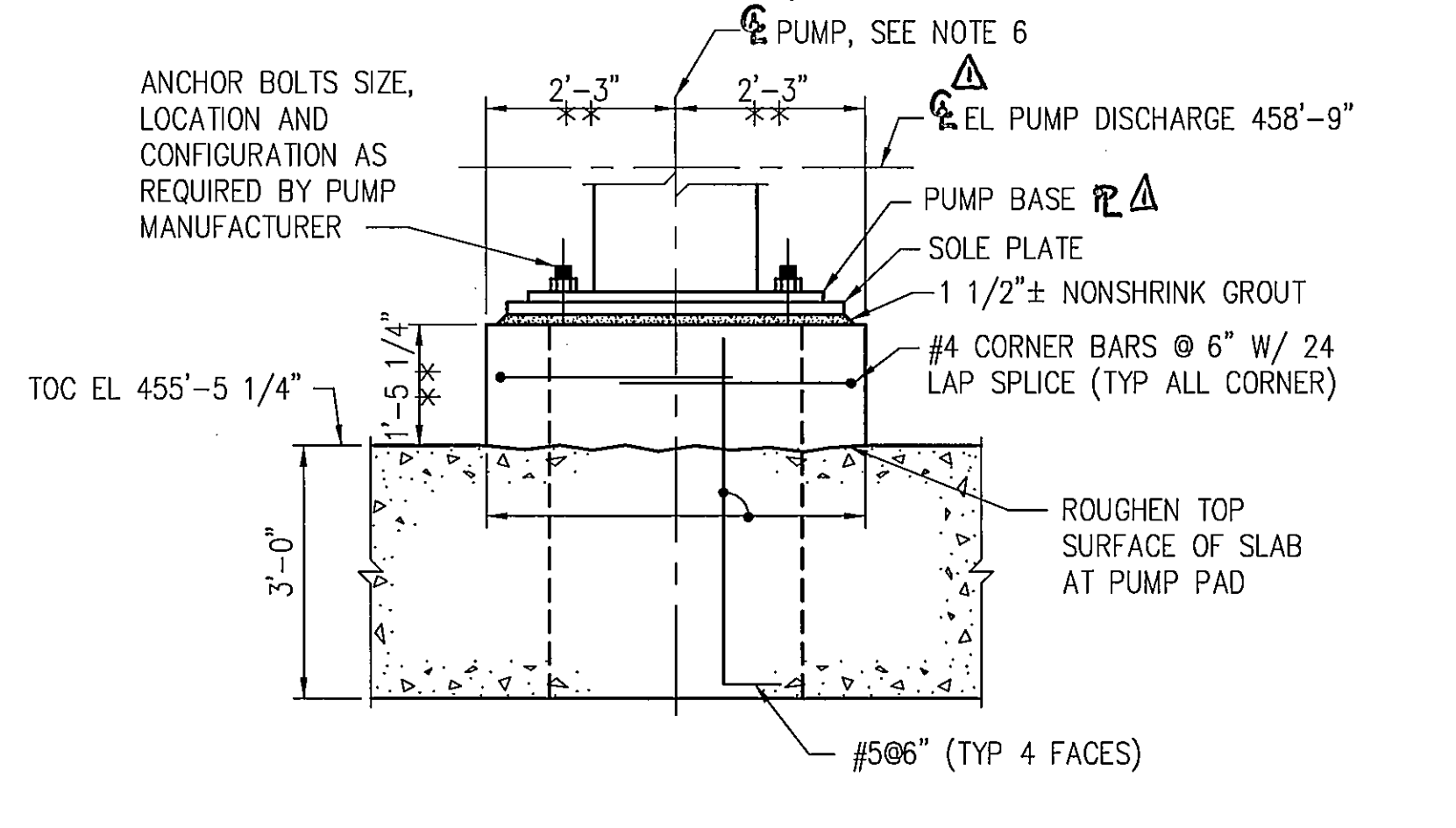
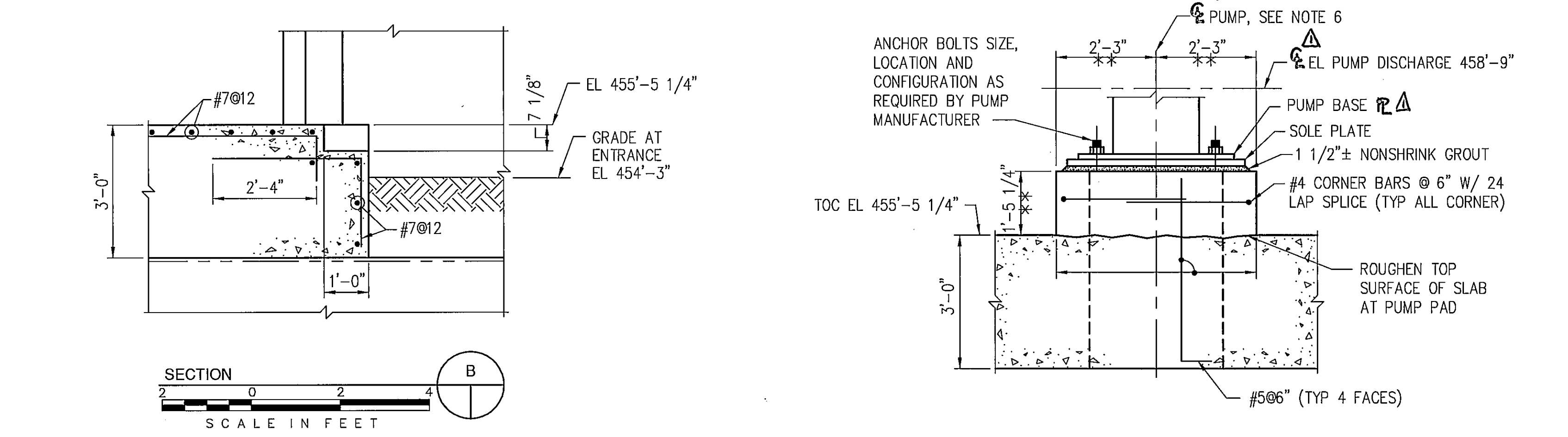
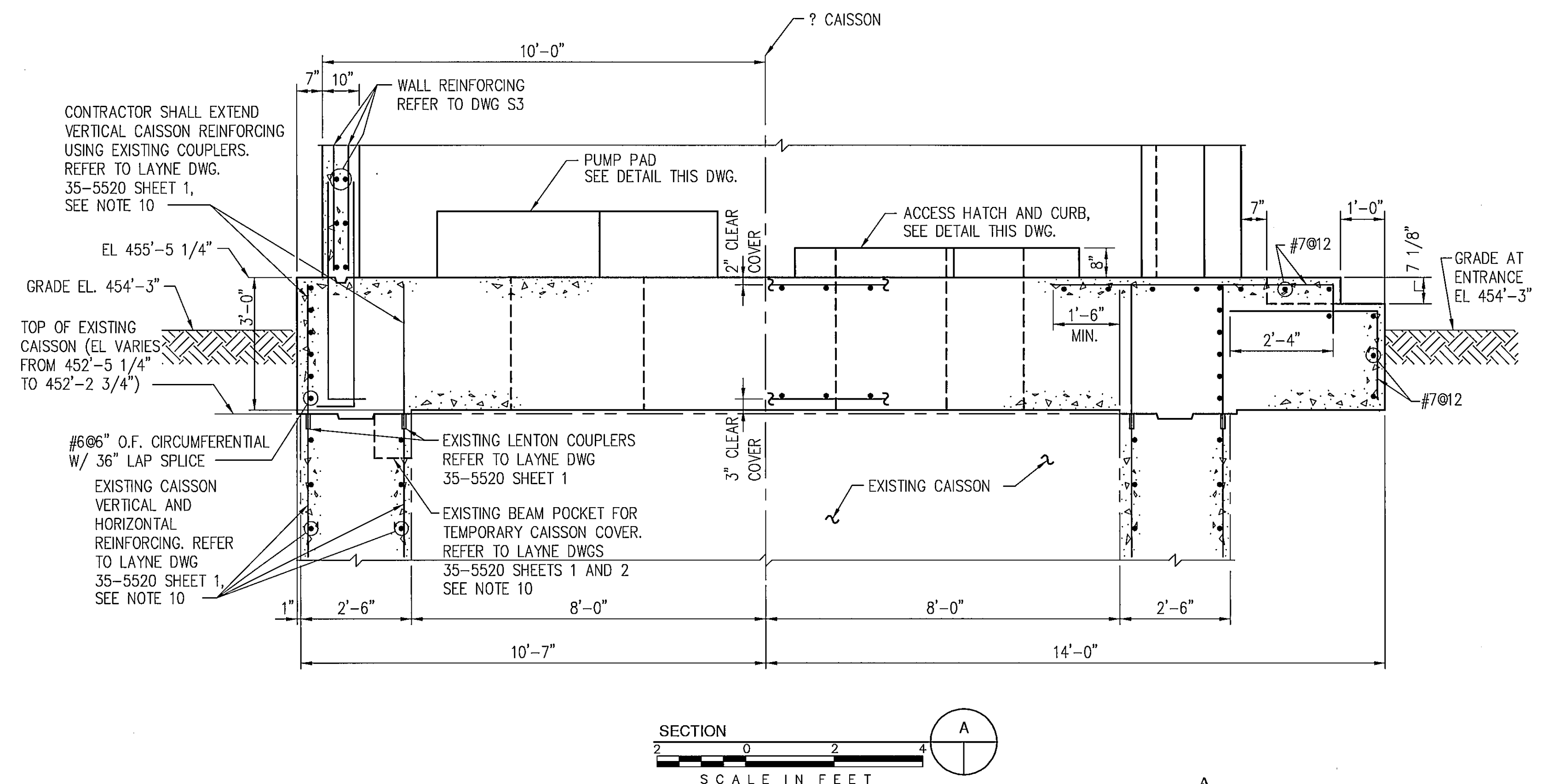
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LONDON BRIDGE BEACH PUMP HOUSE	
STRUCTURAL LEGEND	
project	97-777-1-002
contract	W-183-00
drawing	<b>S1</b>
sheet	5 of 21 sheets
file	Lbbphs01.dwg 03-17-2000 12:36 JLR



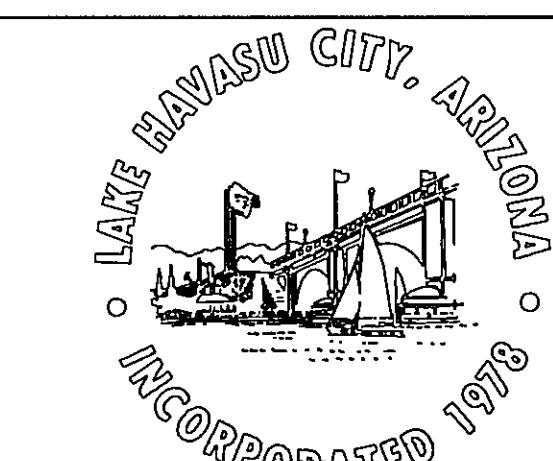
- GENERAL NOTES FOR PUMP HOUSE:**
- CONCRETE COMPRESSIVE STRENGTH,  $f_c = 4000$  psi.
  - CONCRETE REINFORCEMENT, ASTM A615 GRADE 60.
  - STRUCTURAL STEEL:
    - STRUCTURAL TUBING, ASTM A500, GRADE C.
    - STRUCTURAL STEEL ASTM A36.
  - MASONRY:
    - COMPRESSIVE STRENGTH,  $f_m = 1500$  psi.
    - CONCRETE BUILDING BRICK TO BE TINTED SPLIT-FACE IN "TAN" COLOR.
    - PROVIDE EXPANSION JOINTS IN CONCRETE BUILDING BRICK AT 16'-0" CENTERS MAXIMUM SPACING.
    - ALL MASONRY SHALL BE SPECIALLY INSPECTED PER 1997 UBC.
  - DOVETAIL ANCHOR SLOT AND ANCHORS:
    - 24 GAGE, ZINC ALLOY, 1" WIDE x 1" DEEP x 5/8" THROAT
    - DOVETAIL ANCHORS SHALL BE LOCATED AT VERTICAL SPACING PER SPECIFICATIONS.
    - BOTTOM OF DOVETAIL ANCHOR SLOT SHALL BE 1'-2" ABOVE FINISH FLOOR.
  - \* \* \* INDICATES DIMENSIONS OR ELEVATIONS TO BE VERIFIED BY CONTRACTOR. IF DIMENSION OR ELEVATION DIFFERS, CONTRACTOR SHALL NOTIFY ENGINEER IN WRITING.
  - CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING AND PROVIDING ALL OPENINGS AS REQUIRED FOR MECHANICAL, ELECTRICAL AND PROCESS EQUIPMENT.
  - REINFORCE ALL WALL PENETRATIONS PER DETAILS CO-1 AND CO-2 AS WELL AS PROVIDE CLOSURES AT OPENINGS. REFER TO DRAWING S4.
  - CONTRACTOR SHALL REMOVE AND DISPOSE OF TEMPORARY CAISSON COVER, REFER TO LAYNE DRAWINGS 35-5520 SHEETS 1 AND 2. SEE NOTE 10.
  - UPON CONTRACTOR'S REQUEST IN WRITING, THE CITY OF LAKE HAVASU CITY WILL PROVIDE REFERENCE DRAWINGS OF THE EXISTING CAISSON, DESIGNED AND CONSTRUCTED BY RANNEY DIVISION, LAYNE CHRISTENSEN COMPANY.



no.	date	by	revision
1	8-15-01	JDF	AS-BUILT

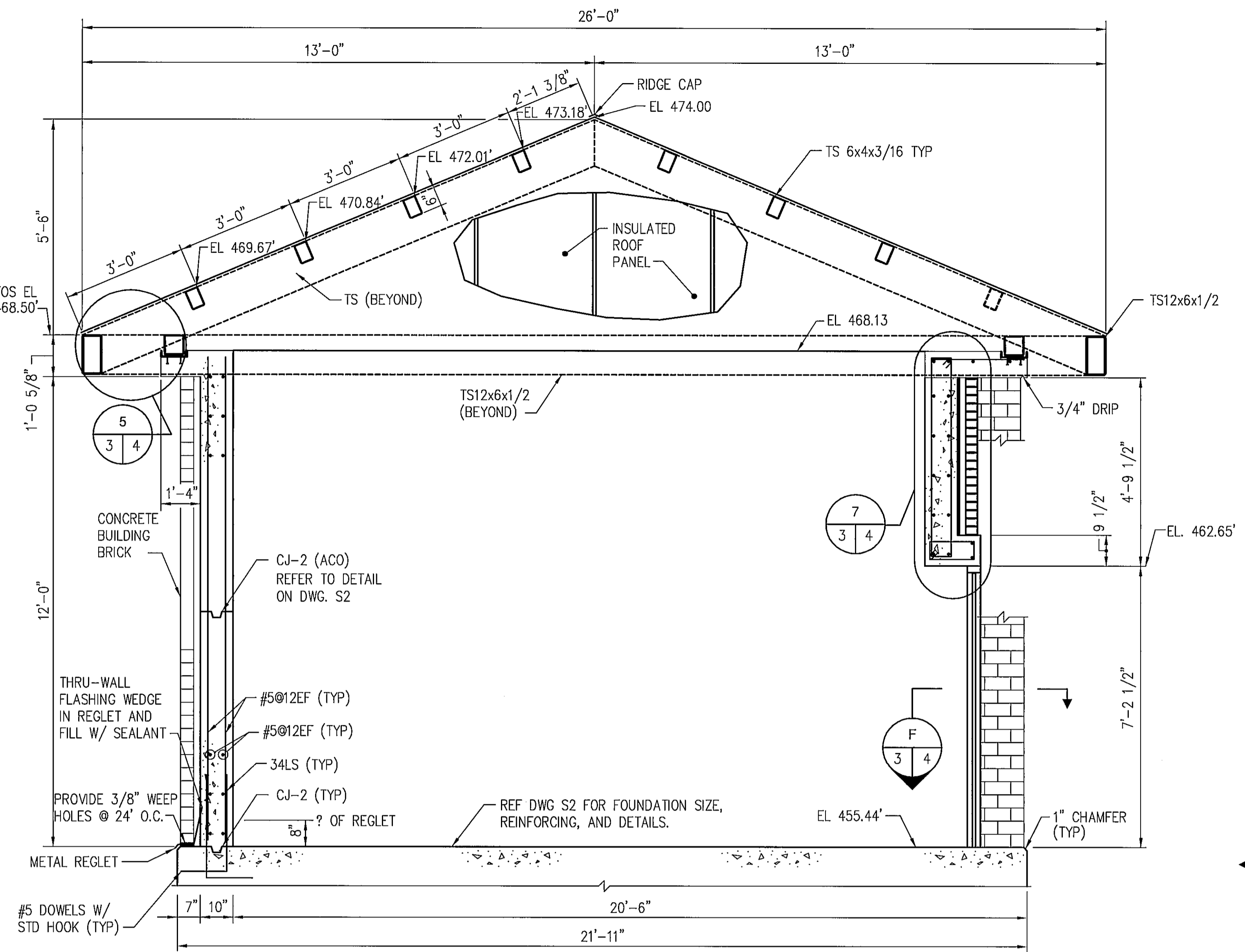
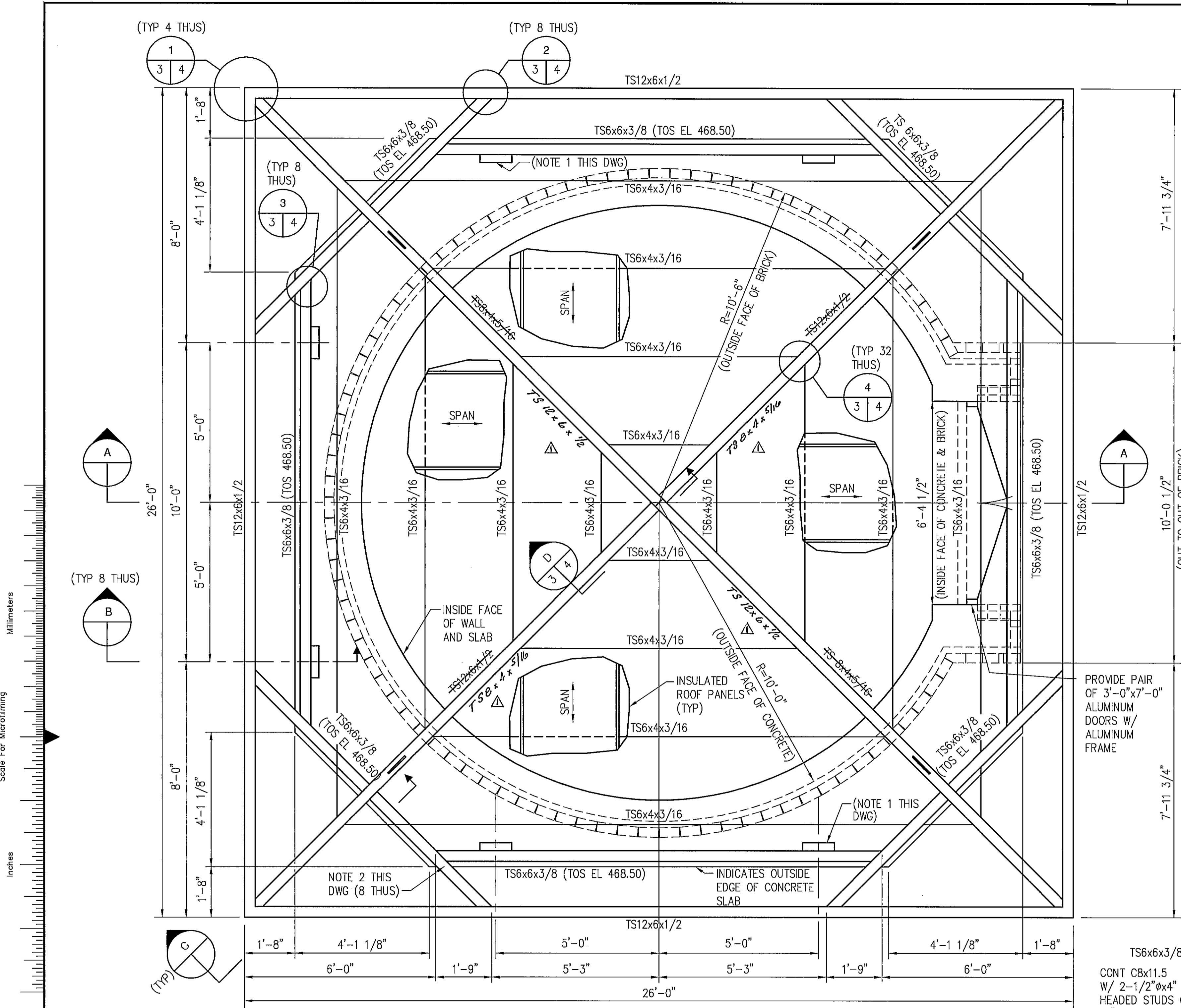


date NOV. 17, 1999  
 designed L. BUCK  
 detailed J. ROUTON  
 checked B.B.

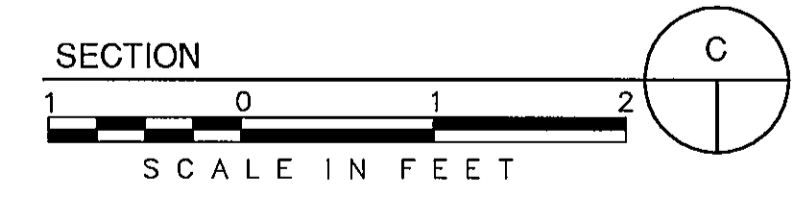
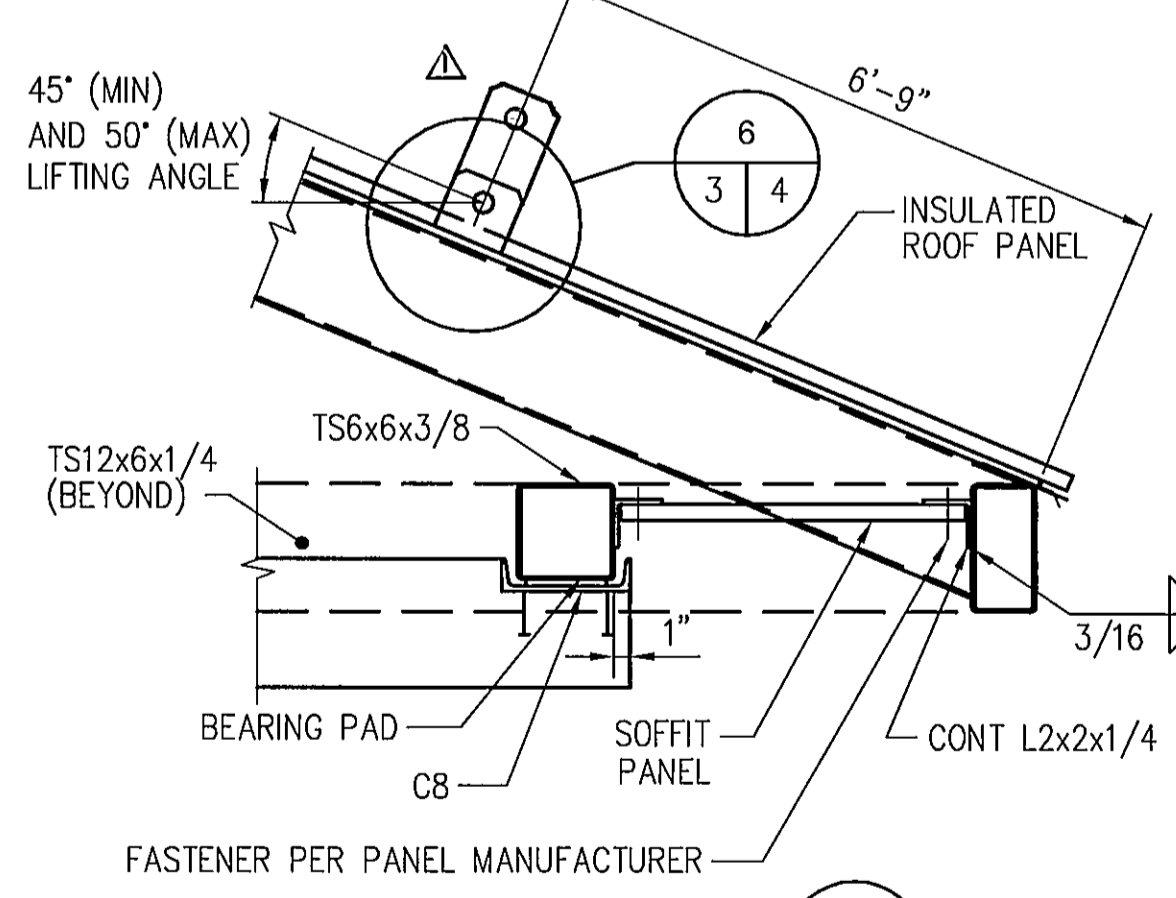
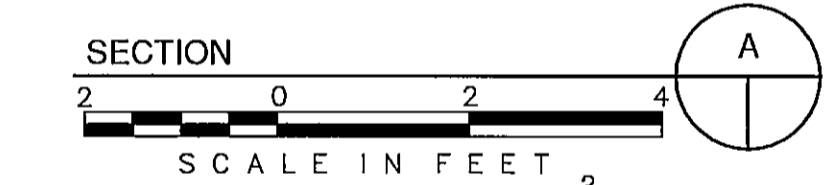
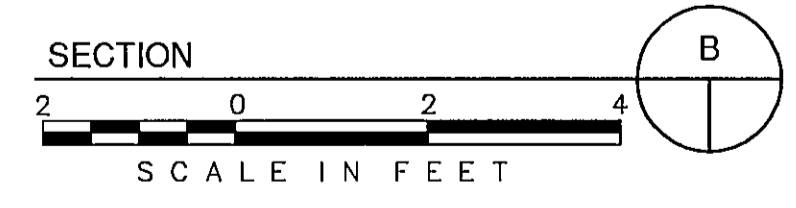
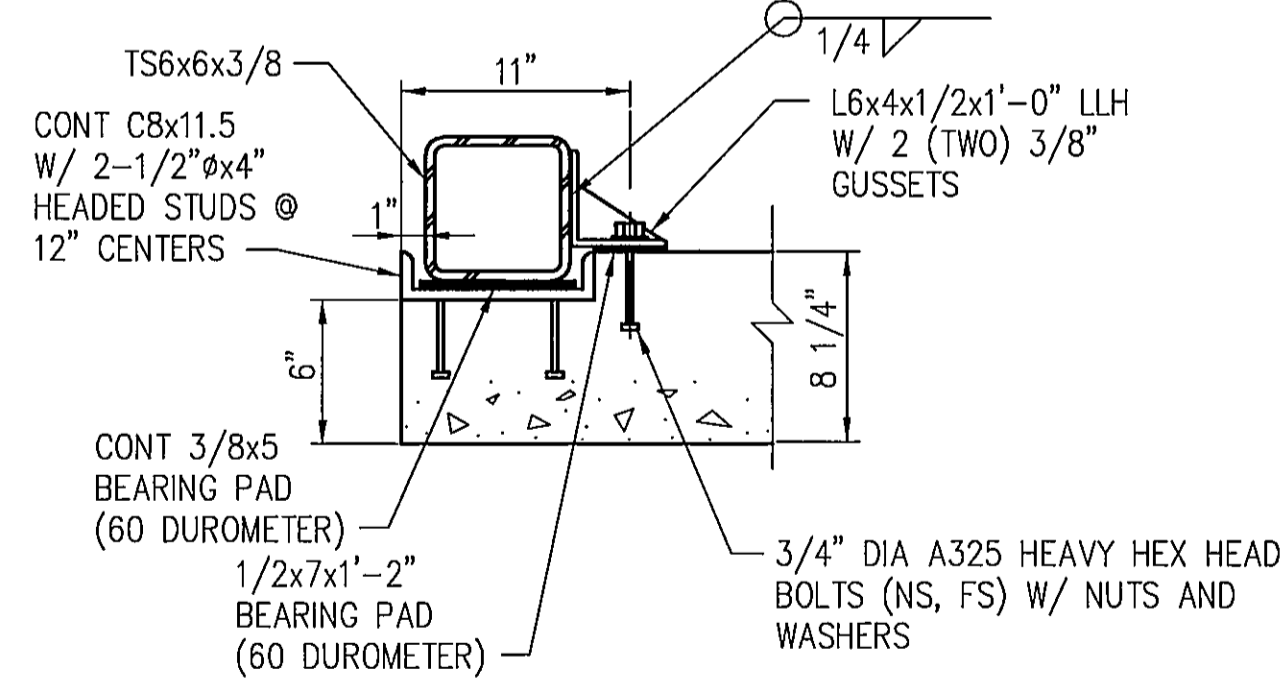
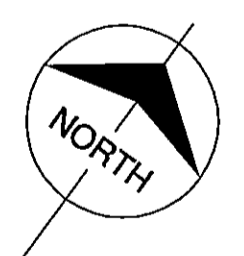
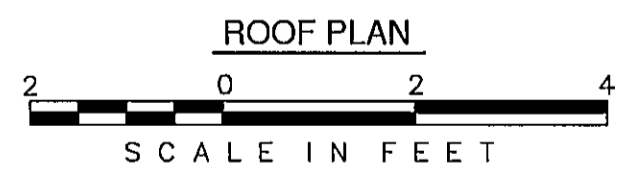


LONDON BRIDGE BEACH PUMP HOUSE  
 FOUNDATION PLAN AND DETAILS  
 project 97-777-1-002 contract W-183-00  
 drawing S2 rev. 1  
 sheet 6 of 21 sheets  
 file

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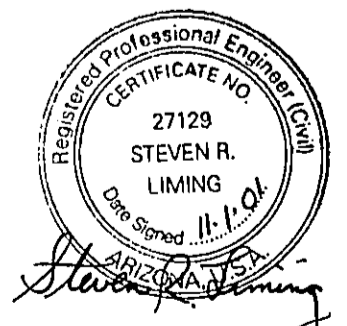


**NOTES:**  
 1. CONTRACTOR SHALL GROUND THESE TWO CONNECTIONS SHOWN ACCORDING TO ELECTRICAL DRAWING E3.  
 2. MITER AND CUT CHANNEL TO ALLOW STRUCTURAL STEEL TUBE TO BEAR UNIFORMLY ON BEARING AT CORNERS.



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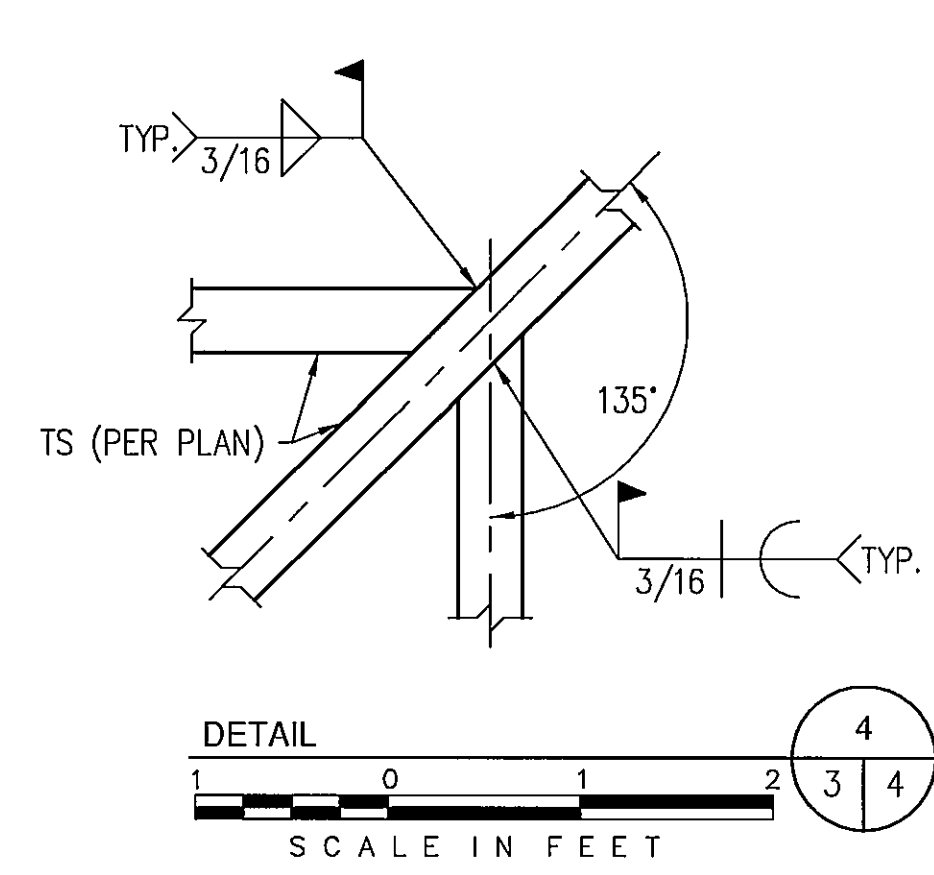
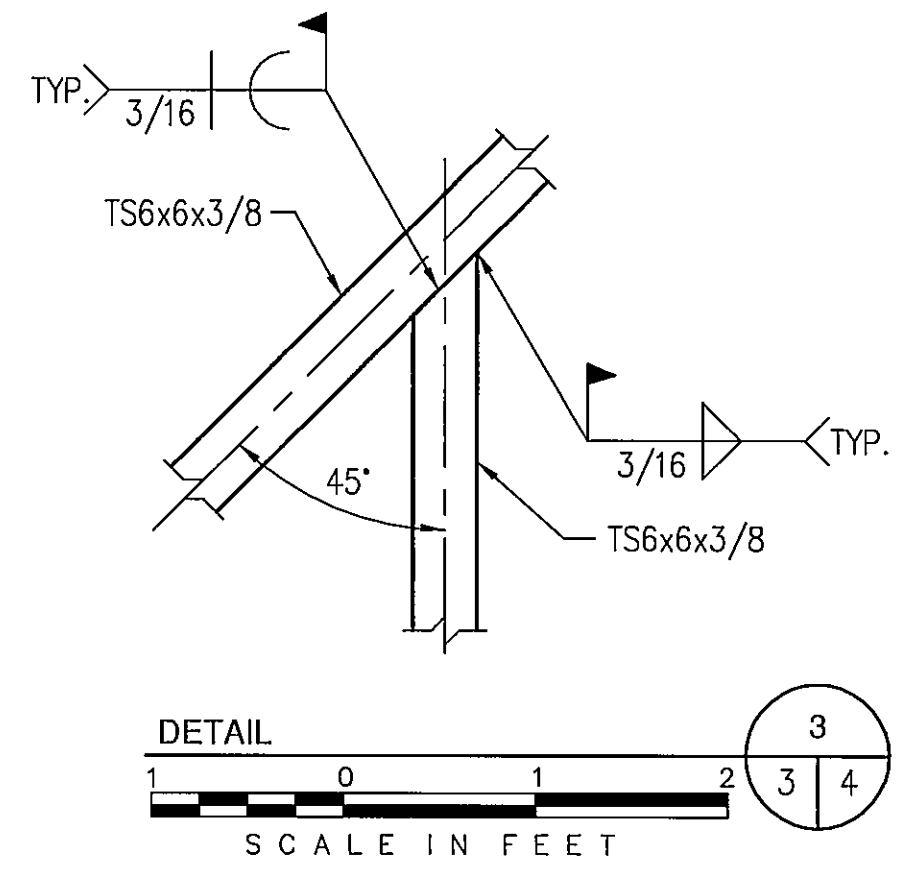
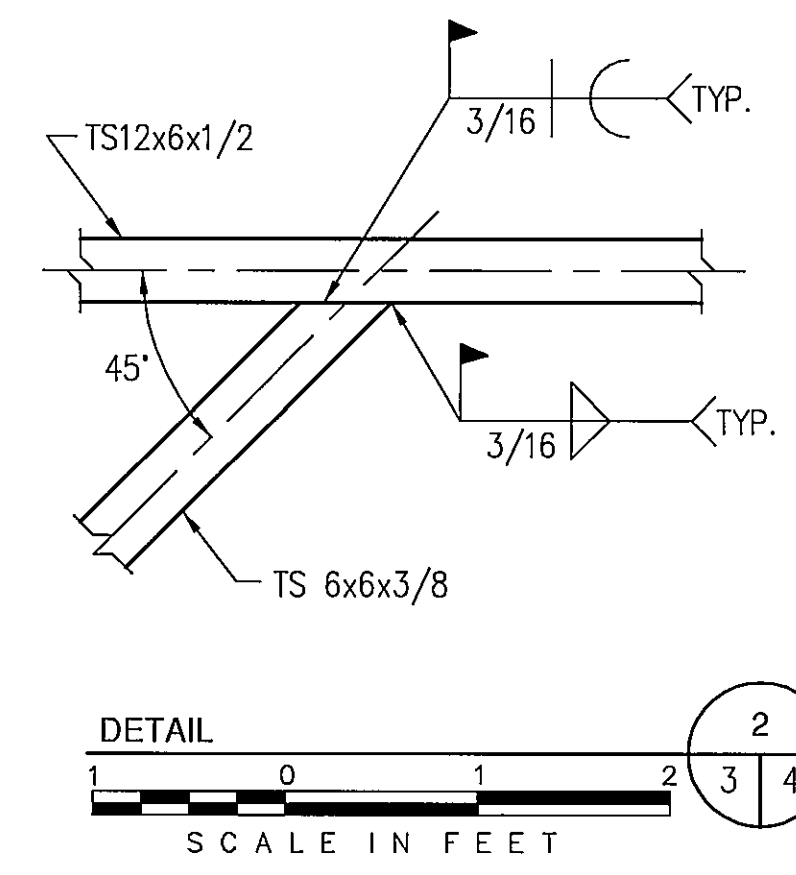
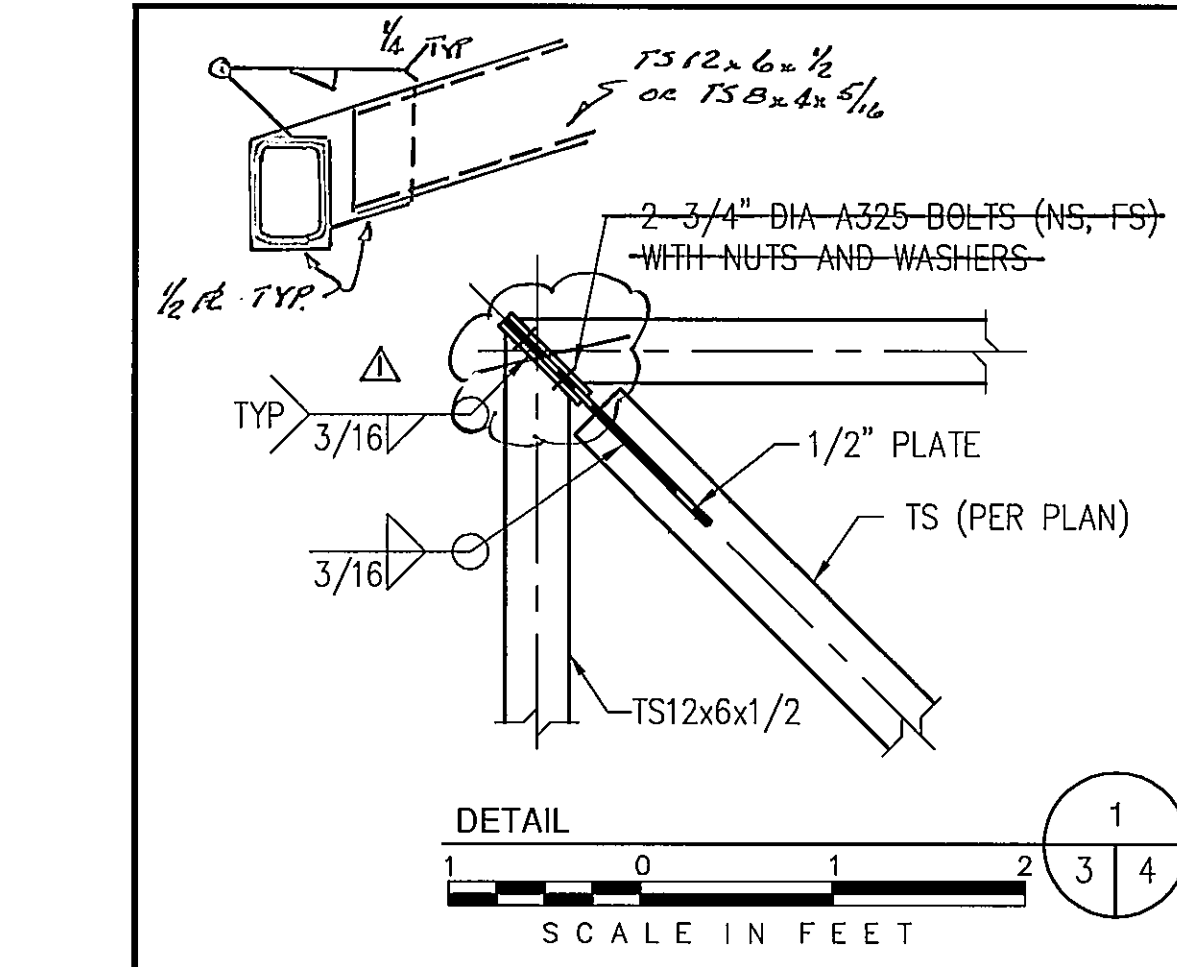
no.	date	by	revision
Δ	8-15-01	JDF	REVISED TS LOCATIONS & MODIFIED LIFTING EYE DETAIL
	8-15-01	JDF	AS-BUILT



date NOV. 10, 1999  
 designed C. LEATON  
 detailed J. ROUTON  
 checked B.B.



LONDON BRIDGE BEACH PUMP HOUSE  
 ROOF PLAN AND DETAILS  
 project 97-777-1-002 contract W-183-00  
 drawing S3 rev. 1  
 sheet 7 of 21 sheets  
 file Lbbphs03.dwg 03-23-2000 14:00 JLR

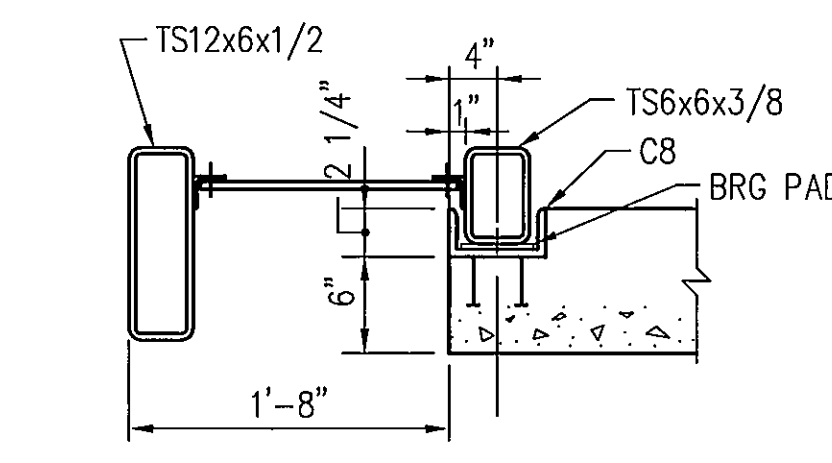
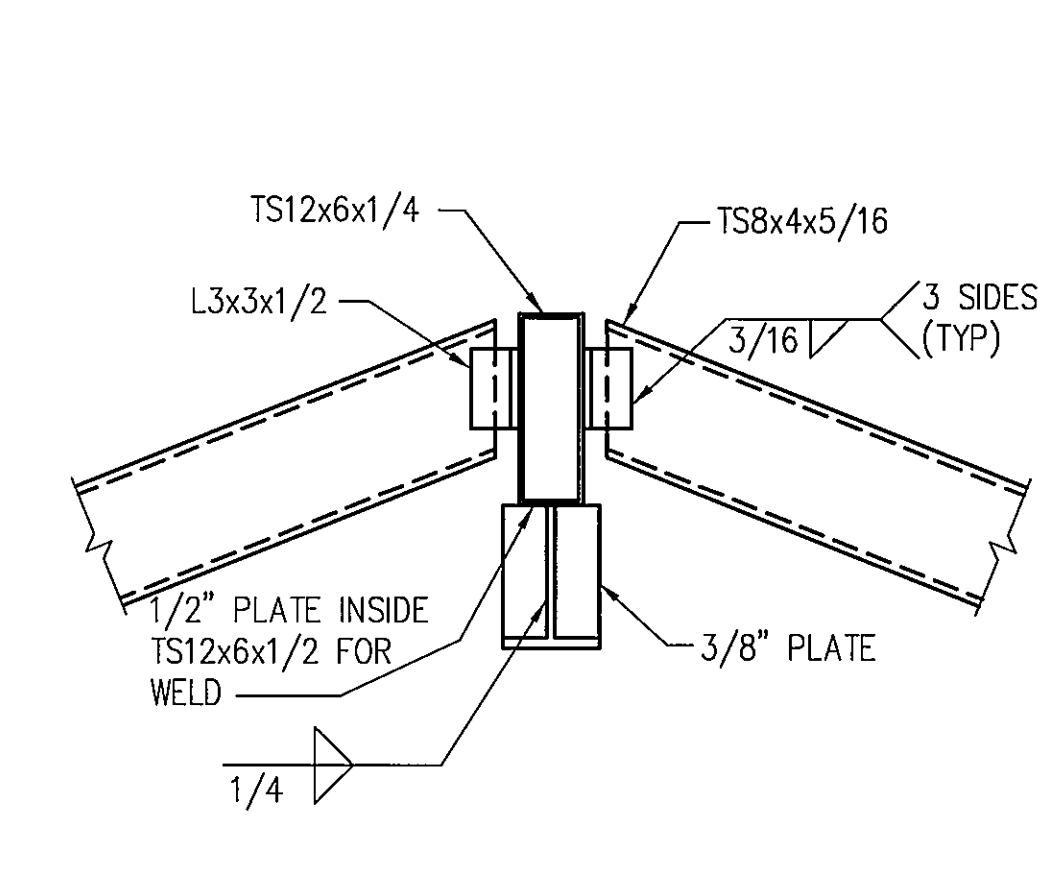
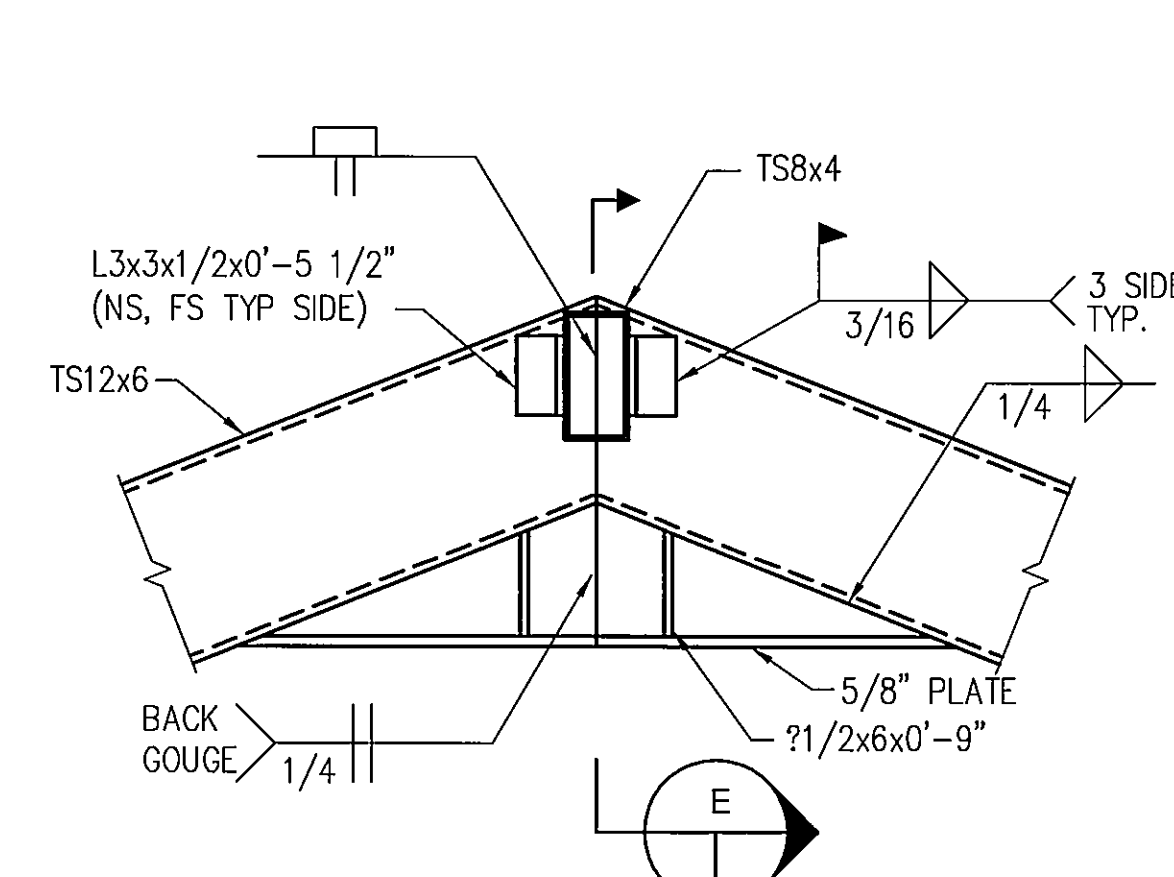
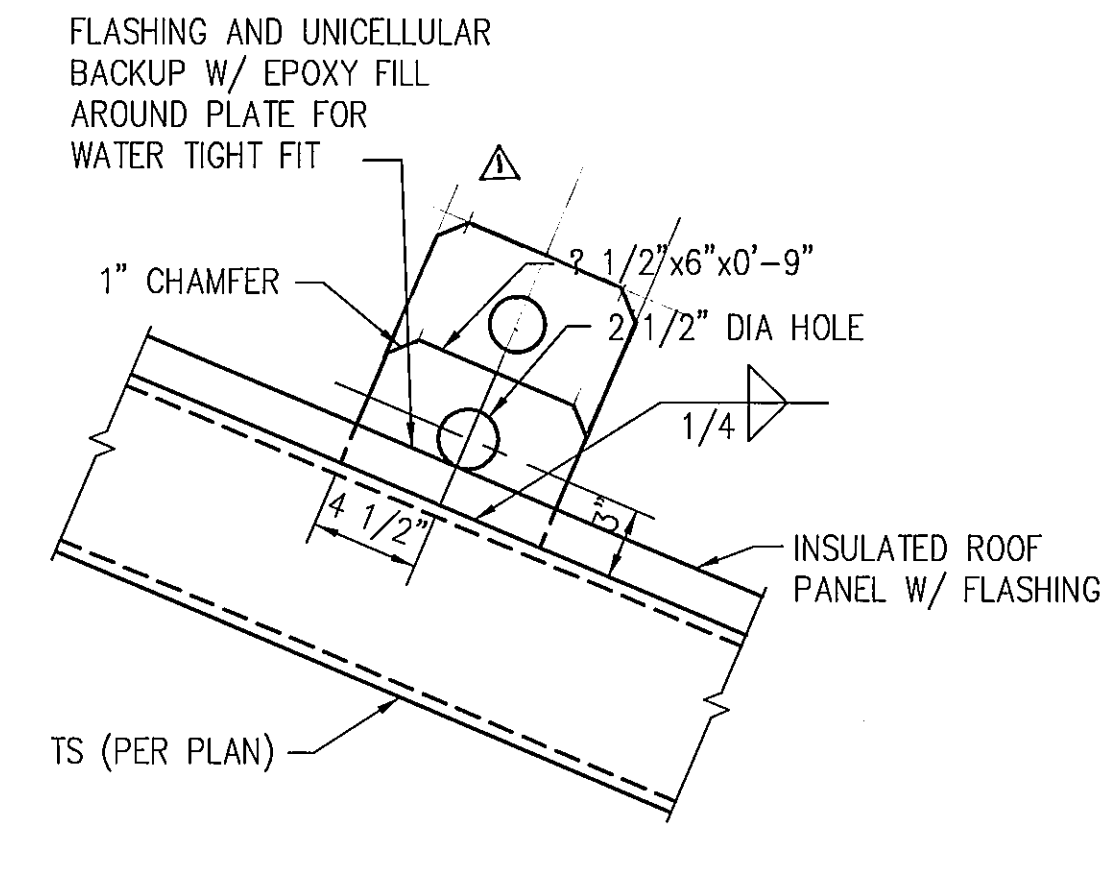


DETAIL 1  
SCALE IN FEET

DETAIL 2  
SCALE IN FEET

DETAIL 3  
SCALE IN FEET

DETAIL 4  
SCALE IN FEET

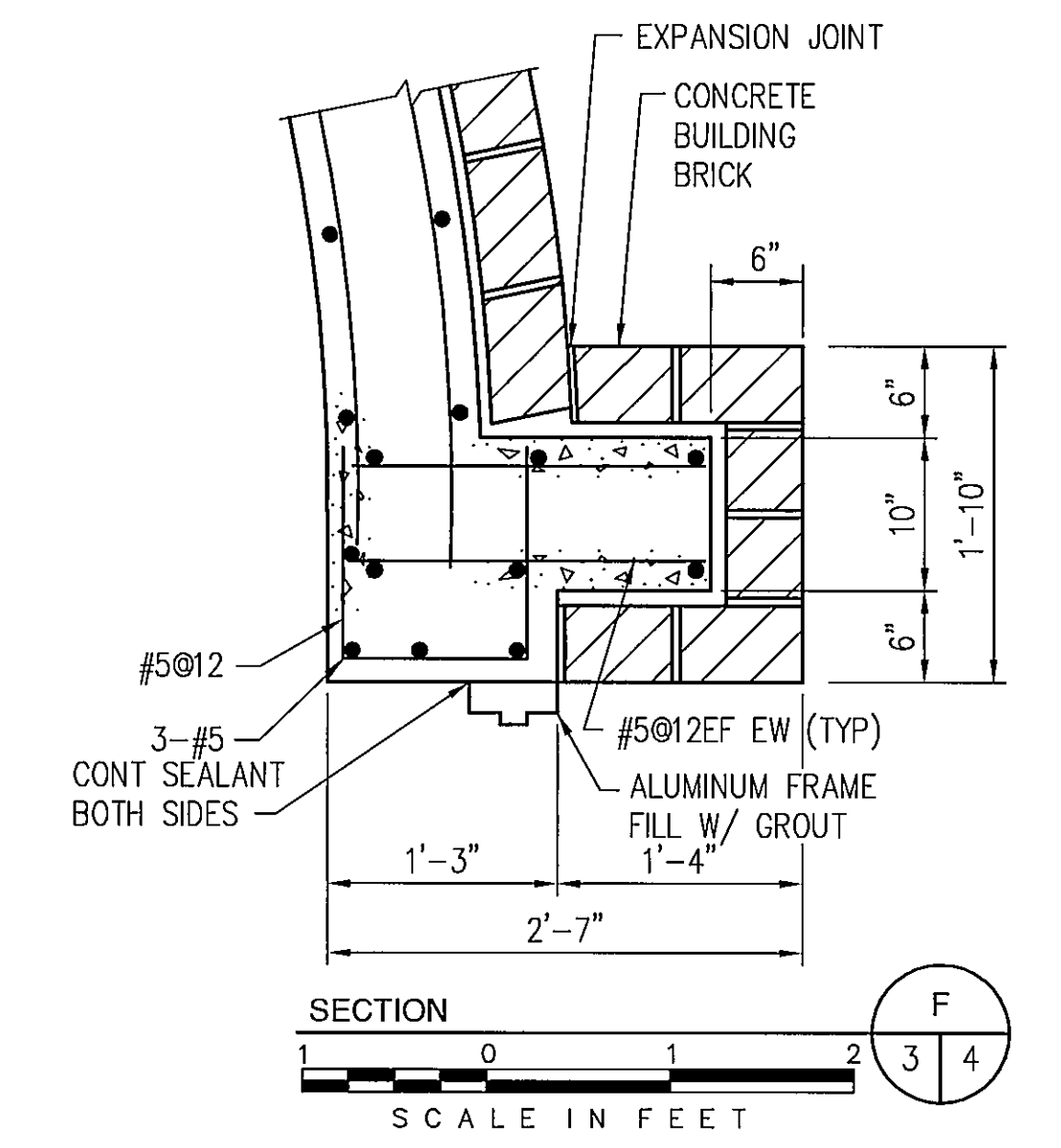


DETAIL 5  
SCALE IN FEET

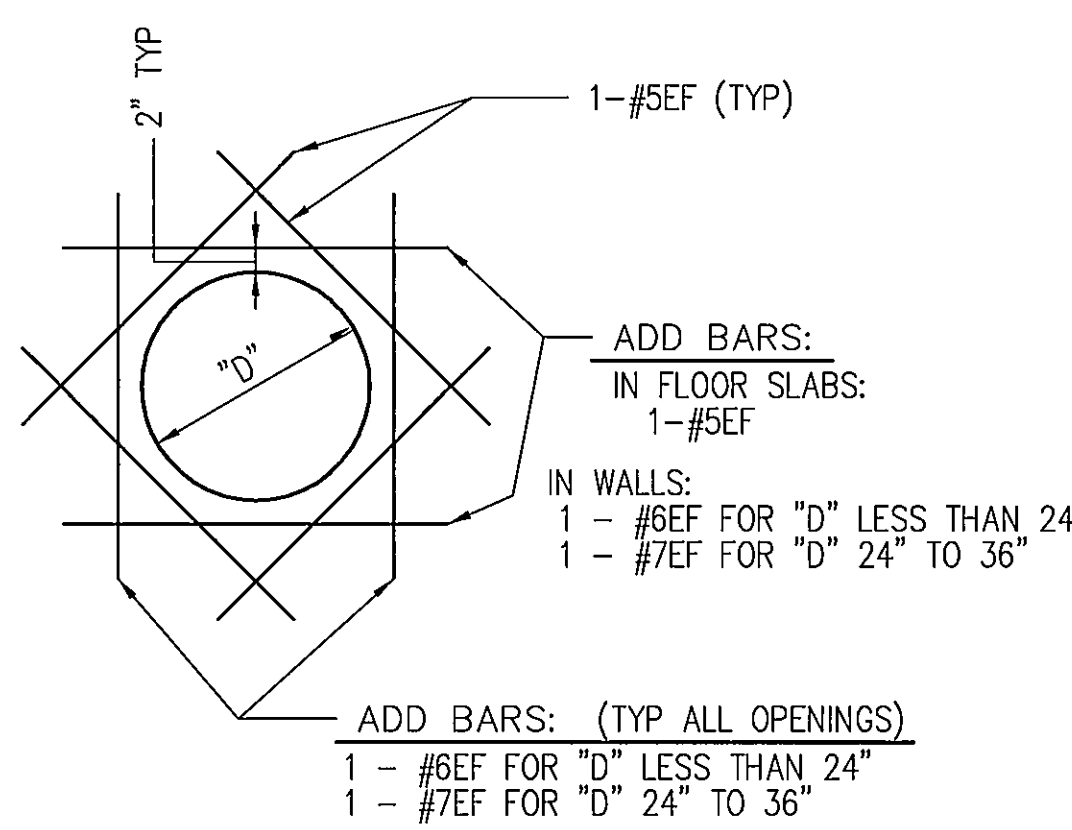
DETAIL 6  
SCALE IN FEET

SECTION D  
SCALE IN FEET

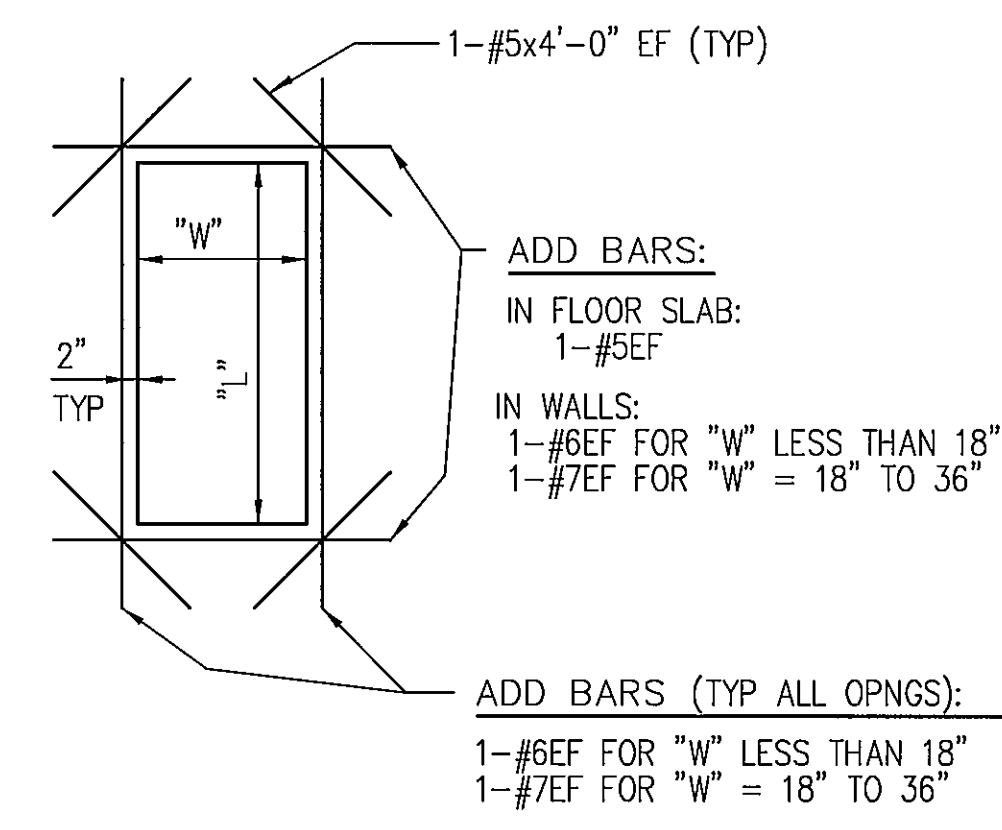
SECTION E  
SCALE IN FEET



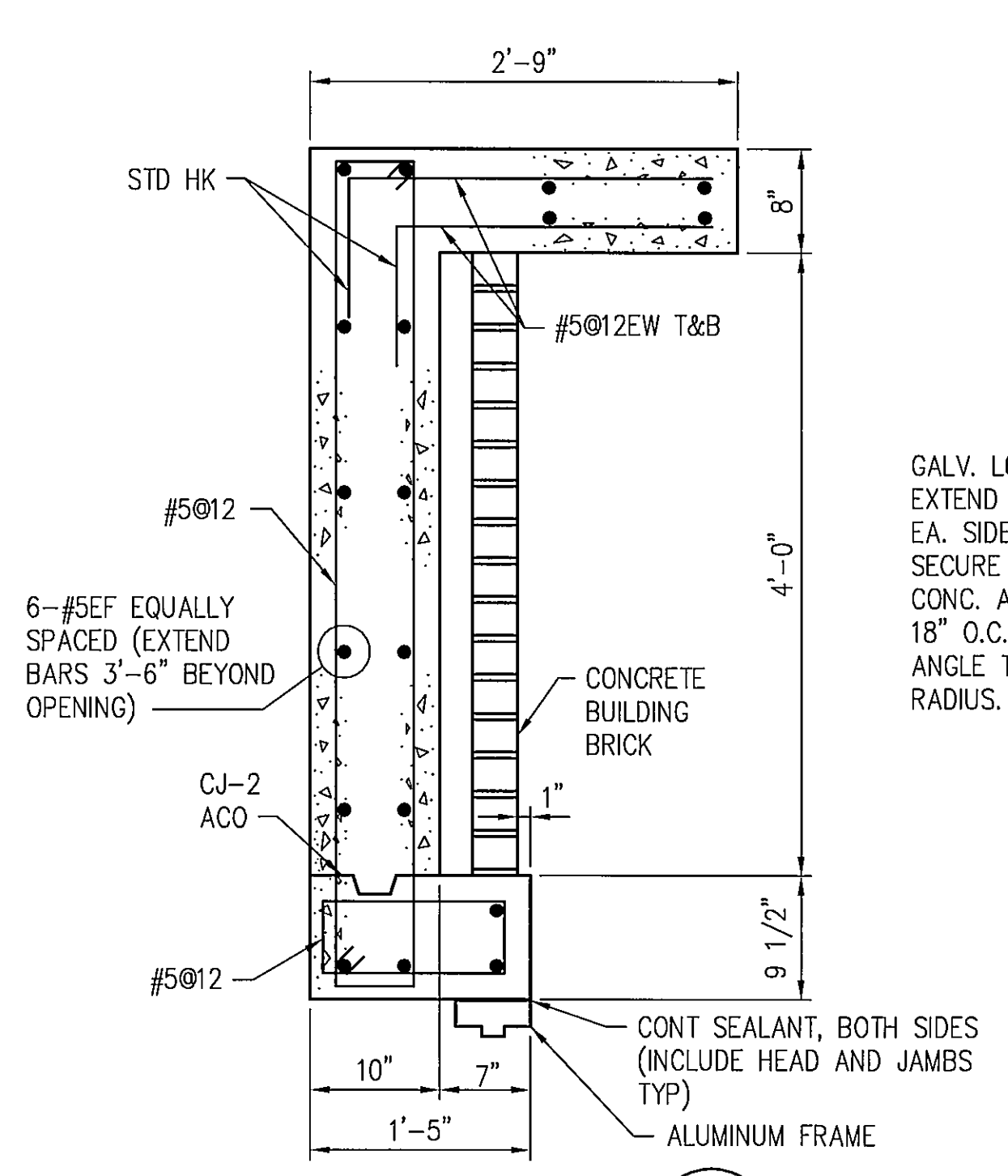
SECTION F  
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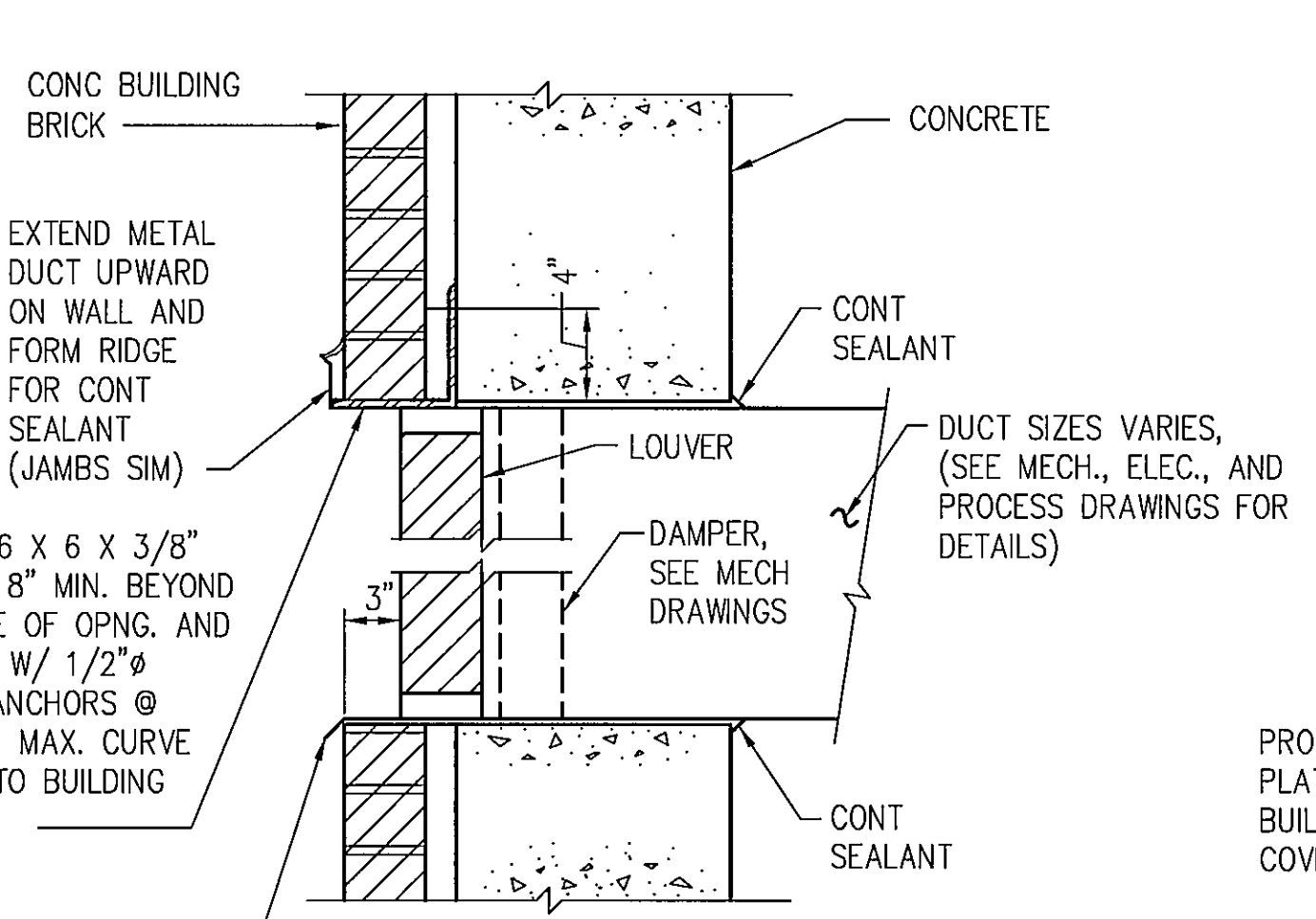
UNSLEEVED OPENING  
CO-1



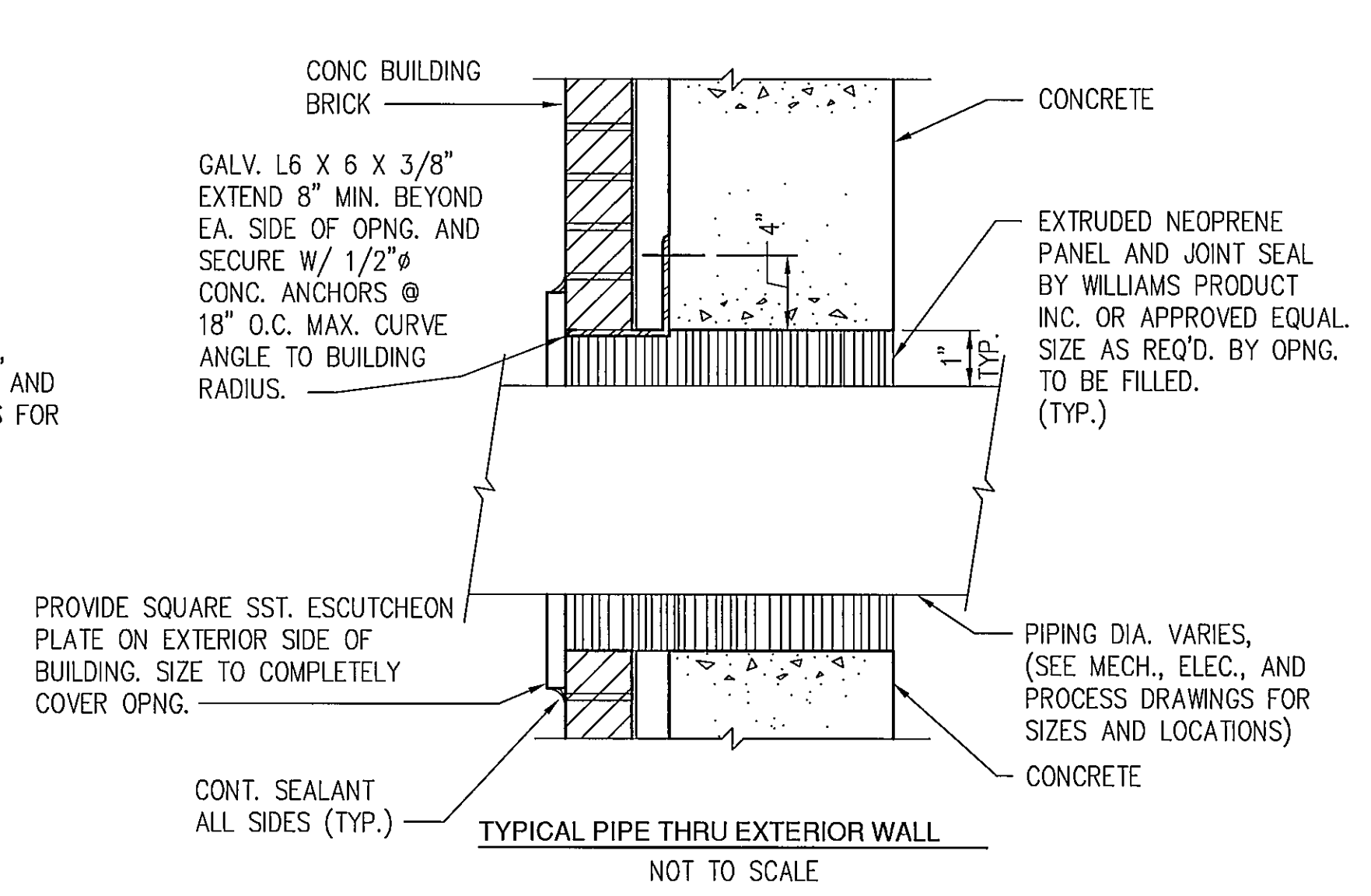
UNSLEEVED OPENING  
CO-2



SECTION 7  
SCALE IN FEET



TYPICAL EXHAUST LOUVER DETAIL  
NOT TO SCALE



TYPICAL PIPE THRU EXTERIOR WALL  
NOT TO SCALE

NOTES:  
1. ALL BAR MINIMUM LENGTHS TO BE ("D" + 3'-6") WITH BARS CENTERED ON OPENING.  
2. FOR OPENINGS LESS THAN 12" IN DIAMETER, THE ADD BARS ARE NOT REQUIRED IF NO REINFORCING IS CUT BY THE OPENING.  
3. SHORT SPAN OF SLAB = LESSER DISTANCE BETWEEN SUPPORT MEMBERS.  
4. REINFORCE OPENINGS WITH "D" LARGER THAN 36" AS INDICATED ON THE DRAWINGS. IF NOT INDICATED, CONTACT THE ENGINEER.

NOTES:  
1. ALL MINIMUM LENGTHS TO BE (L OR W + 3'-6") WITH BARS CENTERED ON OPENING.  
2. FOR OPENINGS (W/L) LESS THAN 12", THE ADD BARS ARE NOT REQUIRED IF NO REINFORCING IS CUT BY THE OPENING.  
3. SHORT SPAN OF SLAB = LESSER DISTANCE BETWEEN SUPPORT MEMBERS.  
4. REINFORCE OPENINGS WITH "L" OR "W" LARGER THAN 36" AS INDICATED ON THE DRAWINGS. IF NOT INDICATED, CONTACT THE ENGINEER.

Scale For Micromin

Inches

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no.	date	by	revision
Δ	8-15-01	JDF	REVISED CORNER DETAIL & LIFTING EYE DETAIL.
	8-15-01	JDF	AS-BUILT



date JAN. 6, 2000  
designed C. LEATON  
detailed J. ROUTON  
checked B.B.

"AS-BUILT"



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(OUTSIDE MARIQUA COUNTY)



LONDON BRIDGE BEACH PUMP HOUSE

DETAILS AND SECTIONS

project 97-777-1-002 contract W-183-00

drawing S4 rev. 1

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