Expires 06/30/2025

LAKE HAVASU CITY, ARIZONA

ADDENDUM NO. 4

Horizontal Collector Well Redevelopment Project
Project B24-PW-108030-500434

DATED: DECEMBER 21, 2023

This Addendum No. 1 forms a part of the contract described above.

The following questions were received from bidders. The answers are provided herein by the OWNER:

1. **Question:** *Is there a pre-bid site meeting scheduled?*
   Answer: A pre-bid meeting is not scheduled for this project.

2. **Question:** *Can the bid date be pushed to the middle of January?*
   Answer: Due to the urgency of completing the work as soon as possible, the bid date cannot be delayed.

3. **Question:** *Can the time of completion day be extended to end of July 2024?*
   Answer: The well must be operational with one pump equivalent to those currently in the well by May 1. Well cleaning and other work may occur after this date but the well may be placed into service as a backup water supply at any time and the Contractor must maintain the well to be in operable condition within 8 hours of receiving written notice by the City.

4. **Question:** *Can you provide detailed information for materials and construction on the pumping units?*

Answer: Materials and construction of the pumping units are to be proposed by the Contractor based on supplier availability. Standard construction using cast iron bowls and bronze impellers would be found acceptable.

5. **Question:** *Is there factory testing on the pumps?*
   Answer: Factory testing is not a specified requirement.

6. **Question:** *What size is the column pipe?*
   Answer: Column pipe size is to be proposed by the Contractor based on supplier availability. Column pipe size for the 4,000 gpm pump of 16-inch would be found acceptable. Column size for the 6,000 gpm pump of 20-inch would be found acceptable. Other sizes that are more readily available would be considered.

7. **Question:** *What size are the discharge heads?*
   Answer: The as-built drawings for the Horizontal Collector Well are attached.

8. **Question:** *Is there a spec. on the new motors?*
   Answer: The motors are to be proposed by the Contractor based on supplier availability. Standard vertical motors sized to the required horsepower of the pump without exceeding the motor nameplate horsepower or using the motor service factor would be acceptable.

9. **Question:** *Can more detailed drawing be provided?*
   Answer: The as-built drawings for the Horizontal Collector Well are attached.

10. **Question:** *Part 2.0 of Section 00700 discusses the timing of the Notice to Proceed in relation to the Notice of Award for this project. In light of the bid date of January 2nd as well as the expedited work schedule, approximately when does the City anticipate the Notice of Award and Notice to Proceed will be issued?*
    Answer: The City anticipates issuing the Notice of Award January 10, 2024. The hope is that the contract can be processed and signed by all in less than a week so the NTP can be issued January 15, 2024.

11. **Question:** *Part 17.3 of Section 00700 specifies that the Contractor shall only work an (8) hour day consisting of Monday through Friday. Due to the expedited schedule and anticipated scope of work, can this work schedule be amended to allow extended work hours as well as weekend work?*
    Answer: The City recognizes that the area work site is in a non-residential area and with the knowledge that this is a high priority project with hard deadlines would allow extended work hours and weekend work as needed.

12. **Question:** *Part 9.0.B of Section 00800 states that all power required for completion of the work shall be provided by the Contractor at his expense, yet Part 3.01.B of Section 33 21 13.7 states that electric power is available at the collector well for the Contractor's use. Please clarify if power is available for use by the Contractor on this project and, if so, please provide the voltage and phase of the available power.*
    Answer: Onsite power is available at the site for Contractor use within the existing Motor Control Center (MCC). The Contractor may utilize this power with a temporary connection to the MCC. Temporary power connections shall be in strict conformance with all applicable electrical codes, City standards, and good electrical practice. The existing MCC powers three 400 hp electric motors with 480 volt, 3-phase power. The as-built drawings for the Collector Well, including power diagrams are attached.

13. **Question:** *Parts 3.10 and 3.14 of Section 33 21 13.7 require the collector well to be pumped for durations of 5 hours and 32 hours during pre and post-maintenance testing at rates of up to 5000 gpm. Is this test water to be pumped into the discharge area shown on Drawing G-1 of the project plans or can this test water be pumped to an alternate location designated by the City and better designed to accept this anticipated volume of water?*
    Answer: As specified, the discharge point is shown on the Drawings. Bidders shall prepare their bids to discharge water as specified. The successful Bidder may propose an alternative point of discharge following Award providing it is acceptable to the City, meets all specified discharge criteria, and complies with all Federal, State, and local regulations, codes, and requirements.

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, P.E.

BURNS & McDONNELL ENGINEERING CO., INC.
(602) 385-4500

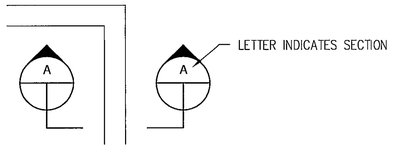
Registered Professional Engineers Corp
CERTIFICATE NO.
27129
STEVEN R. LIMING
Date Signed 11-1-99

"AS-BUILT"

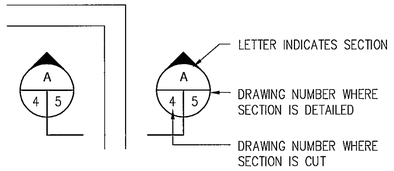
CALL TWO WORKING DAYS BEFORE YOU DIG
1-800-STAKE-IT
1-800-782-5348
(OUTSIDE MARICOPA COUNTY)

Burns & McDonnell
SINCE 1898

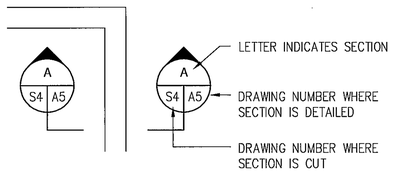
J:\LKHAVASU\977771.002\Drawings\Procvs\Lbbphcov.dwg 12-29-1999 08:44 DBL



SECTION CUT AND DRAWN ON SAME DRAWING.

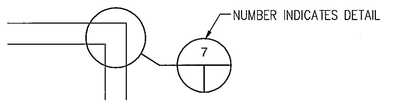


SECTION CUT ON ONE DRAWING AND DRAWN ON ANOTHER DRAWING WITHIN THE SAME DISCIPLINE.



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

SECTION IDENTIFICATION



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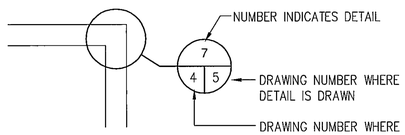

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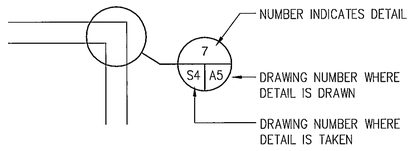


DETAIL TAKEN ON DRAWING OF ONE DISCIPLINE AND DETAILED ON DRAWING OF ANOTHER DISCIPLINE.

DETAIL IDENTIFICATION

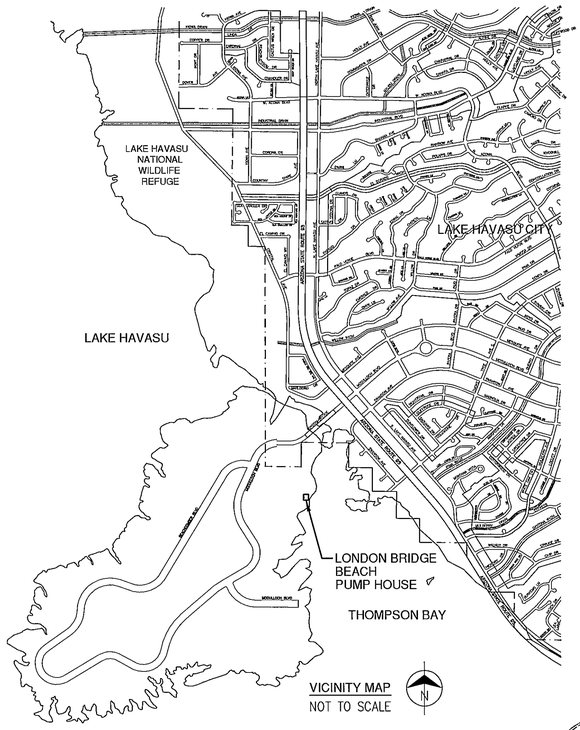
SECTION AND DETAIL IDENTIFICATION SYSTEMS

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, SAMLL 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



VICINITY MAP
NOT TO SCALE

"AS-BUILT"

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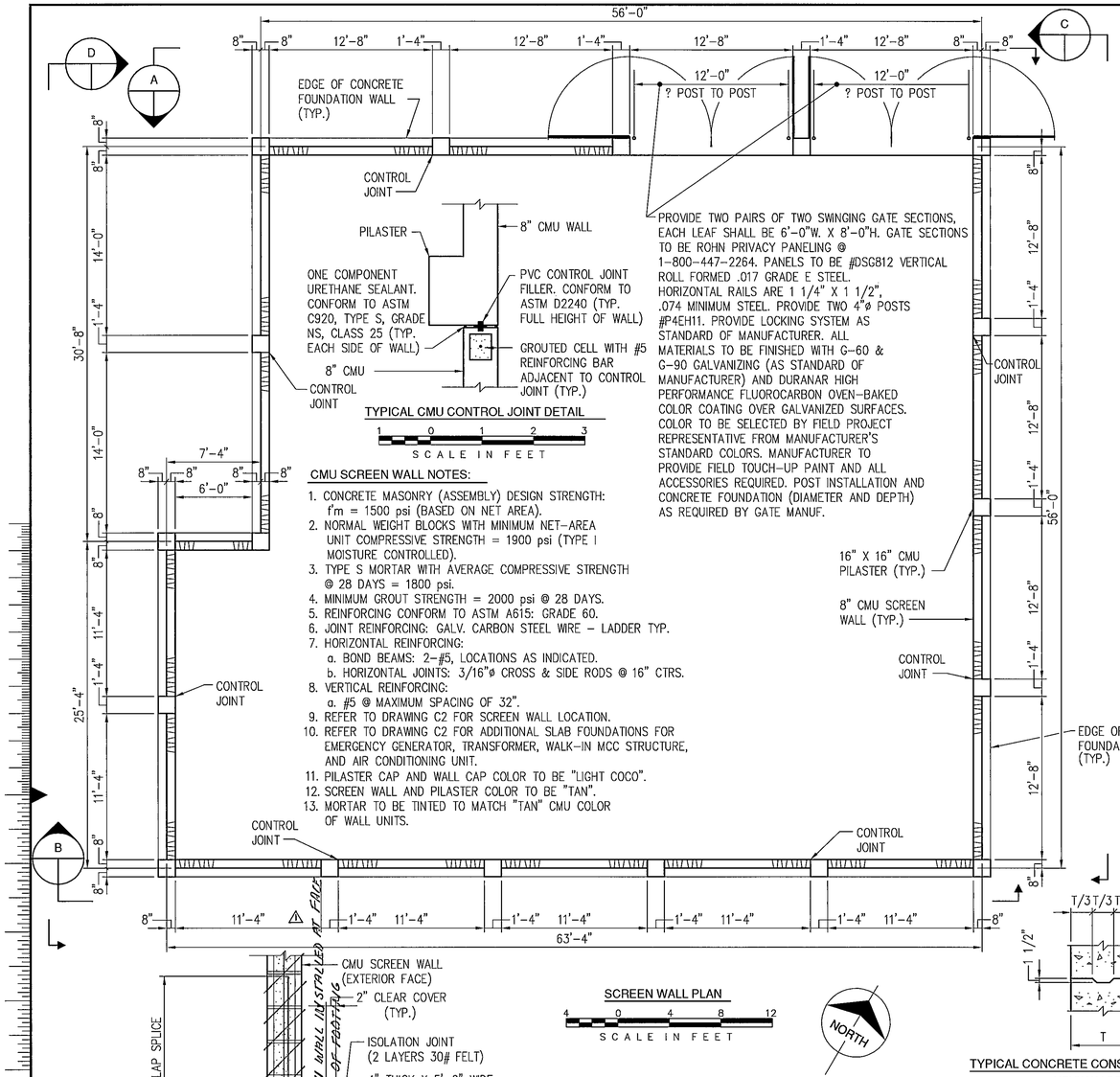
(OUTSIDE MARICOPA COUNTY)

Registered Professional Engineer (Civil)
CERTIFICATE NO.
27129
STEVEN R. LIMING
Date Signed 11-1-01

Burns & McDonnell
SINCE 1898

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

INDEX



PROVIDE TWO PAIRS OF TWO SWINGING GATE SECTIONS, EACH LEAF SHALL BE 6'-0"W. X 8'-0"H. GATE SECTIONS TO BE ROHN PRIVACY PANELING @ 1-800-447-2264. PANELS TO BE #DSG812 VERTICAL ROLL FORMED .017 GRADE E STEEL. HORIZONTAL RAILS ARE 1 1/4" X 1 1/2", .074 MINIMUM STEEL. PROVIDE TWO 4"ø POSTS #P4EH11. PROVIDE LOCKING SYSTEM AS STANDARD OF MANUFACTURER. ALL MATERIALS TO BE FINISHED WITH G-60 & G-90 GALVANIZING (AS STANDARD OF MANUFACTURER) AND DURANAR HIGH PERFORMANCE FLUOROCARBON OVEN-BAKED COLOR COATING OVER GALVANIZED SURFACES. COLOR TO BE SELECTED BY FIELD PROJECT REPRESENTATIVE FROM MANUFACTURER'S STANDARD COLORS. MANUFACTURER TO PROVIDE FIELD TOUCH-UP PAINT AND ALL ACCESSORIES REQUIRED. POST INSTALLATION AND CONCRETE FOUNDATION (DIAMETER AND DEPTH) AS REQUIRED BY GATE MANUF.

TYPICAL CMU CONTROL JOINT DETAIL

1 0 1 2 3
SCALE IN FEET

CMU SCREEN WALL NOTES:

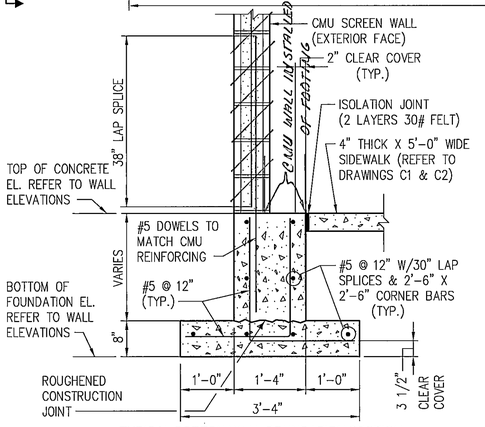
1. CONCRETE MASONRY (ASSEMBLY) DESIGN STRENGTH: f'm = 1500 psi (BASED ON NET AREA).
2. NORMAL WEIGHT BLOCKS WITH MINIMUM NET-AREA UNIT COMPRESSIVE STRENGTH = 1900 psi (TYPE I MOISTURE CONTROLLED).
3. TYPE S MORTAR WITH AVERAGE COMPRESSIVE STRENGTH @ 28 DAYS = 1800 psi.
4. MINIMUM GROUT STRENGTH = 2000 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.

SCREEN WALL PLAN

4 0 4 8 12
SCALE IN FEET

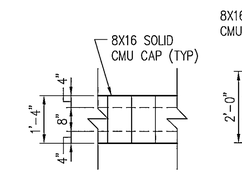
NORTH

TYPICAL CONCRETE CONSTRUCTION JOINT KEYWAY DETAIL
NOT TO SCALE



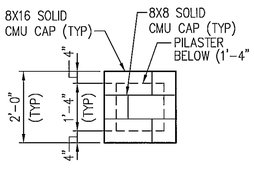
TYPICAL SCREEN WALL FOUNDATION SECTION

1 0 1 2 3
SCALE IN FEET



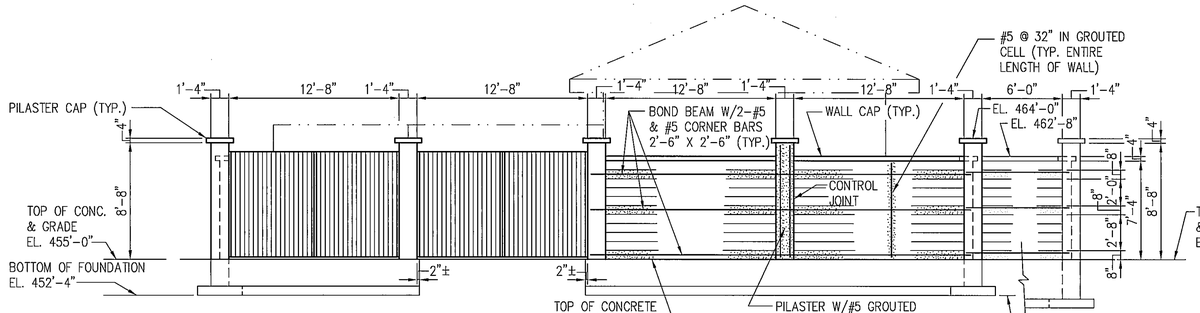
PLAN OF WALL CAP

2 0 2 4
SCALE IN FEET



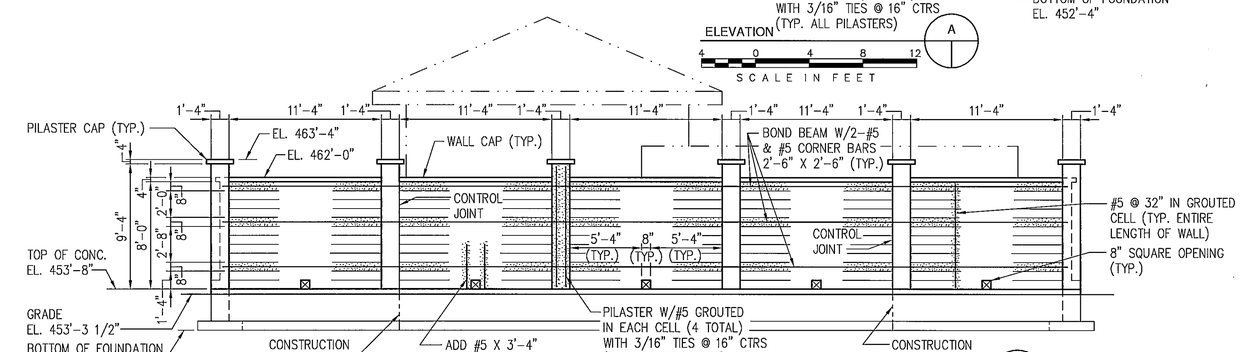
PLAN OF PILASTER CAP

2 0 2 4
SCALE IN FEET



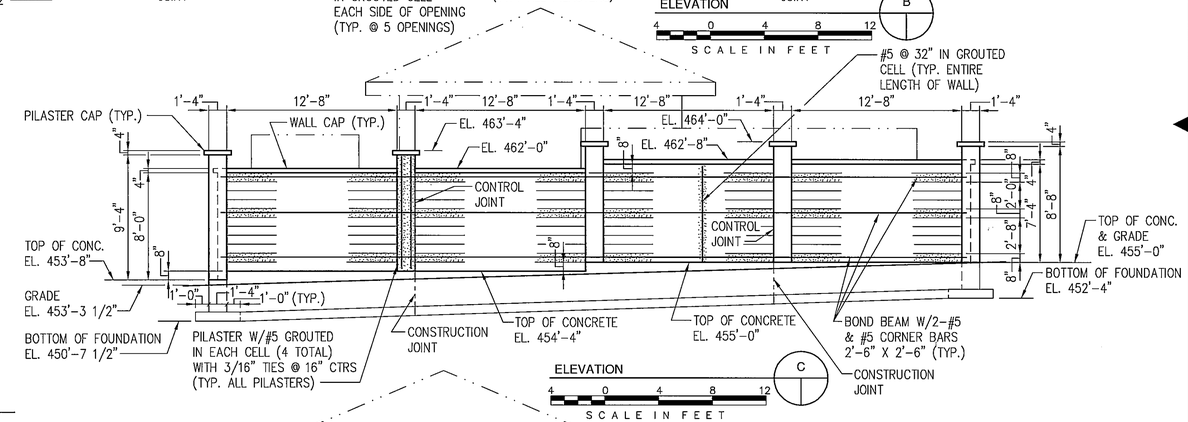
ELEVATION A

4 0 4 8 12
SCALE IN FEET



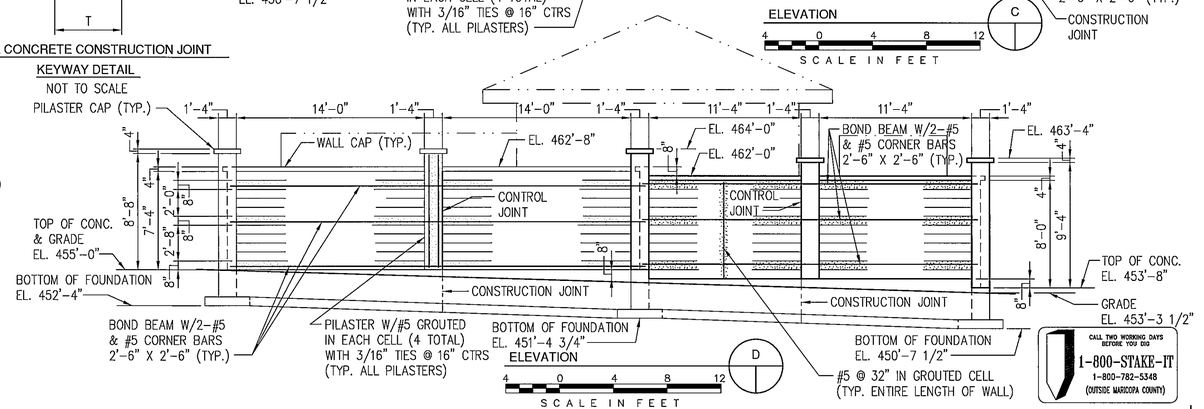
ELEVATION B

4 0 4 8 12
SCALE IN FEET



ELEVATION C

4 0 4 8 12
SCALE IN FEET



ELEVATION D

4 0 4 8 12
SCALE IN FEET

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1-800-782-5348
(OUTSIDE MARICOPA COUNTY)

Registered Professional Engineer (Civil) CERTIFICATE NO. 27129 STEVEN R. LIMING Date Signed 11-1-01

"AS-BUILT"

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

Burns & McDonnell SINCE 1898

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

LAKE HAVASU CITY, ARIZONA INCORPORATED 1978

LONDON BRIDGE BEACH PUMP HOUSE

SCREEN WALL
PLAN, ELEVATIONS AND DETAILS

project 97-777-1-002	contract W-183-00
drawing A1	rev. -
sheet 4 of 21 sheets	
file	

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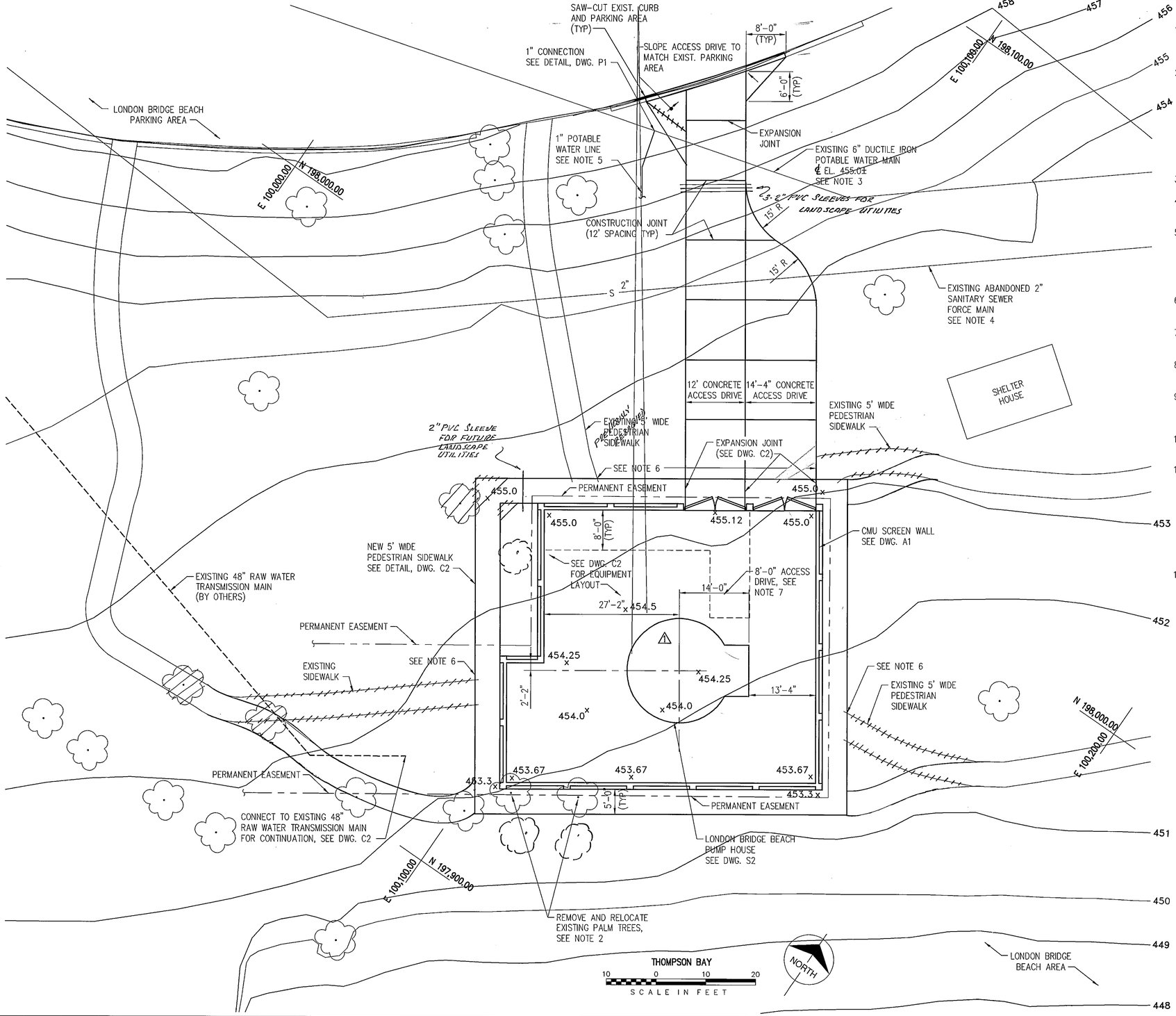
Scale For Microfilming
Millimeters
Inches



GENERAL NOTES:

1. 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.
2. 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. ENCASEMENT 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.
3. ALL ELEVATIONS ARE LAKE HAVASU CITY DATUM.
4. 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.
5. 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.
6. CONTRACTOR SHALL IMPROVE ACCESS AS REQUIRED TO FACILITATE HIS OPERATIONS AT NO ADDITIONAL COST TO THE OWNER.
7. CONTRACTOR SHALL GRADE AND SURFACE AS SPECIFIED ALL AREAS DISTURBED BY CONSTRUCTION UNLESS INDICATED OR SPECIFIED OTHERWISE.
8. CONTRACTOR SHALL PROVIDE CONTINUOUS PROTECTION AGAINST ENTRANCE OF FLOOD WATER INTO THE ENDS OF ALL BORINGS, BORE PITS AND INSTALLED PIPE.
9. REMOVE FENCE, SIDWALKS, 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.
10. CONTRACTOR SHALL TAKE APPROPRIATE STEPS TO PREVENT EROSION OF EARTHWORK AND DEPOSITION OF SEDIMENTS INTO WATER COURSES OR DRAINAGE SWALES.
11. 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.
12. AERIAL PHOTOGRAPHY PERFORMED BY:
    COOPER AERIAL SURVEYING CO.
    1692 W. GRANT ROAD
    TUCSON, AZ 85745

DRAWING C1 NOTES:

1. 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.
2. 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.
3. THIS DRAWING GENERAL NOTE NO. 8.
4. 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.
5. 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.
6. TIE NEW 5'-0" PERIMETER PEDESTRIAN SIDEWALK INTO THE EXISTING SIDEWALK AT NEAREST JOINT OF EXISTING SIDEWALK. SEE DETAIL, DWG C2.
7. MAINTAIN 8'-0" WIDE CLEARANCE FOR ACCESS TO BASE OF CONCRETE PAD FOR MCC WALK-IN STRUCTURE AS SHOWN ON DRAWING C2.
8. FOR SAKE OF CLARITY, PIPING, EQUIPMENT AND HORIZONTAL COLLECTOR WELL LATERALS ARE NOT SHOWN.
9. 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)

Registered Professional Engineer Seal — CERTIFICATE NO. 27129 — STEVEN R. LIMING — Date Signed 11-1-01 — U.S.A.

no.	date	by	revision
1	7-27-01	JJM	(6-G) REVISE DRAWING TO ACCOMMODATE COLLECTOR WELL "AS BUILT"
	8-15-01	JDF	As-Built

Burns & McDonnell SINCE 1898

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

LAKE HAVASU CITY, ARIZONA — INCORPORATED 1978

LONDON BRIDGE BEACH PUMP HOUSE

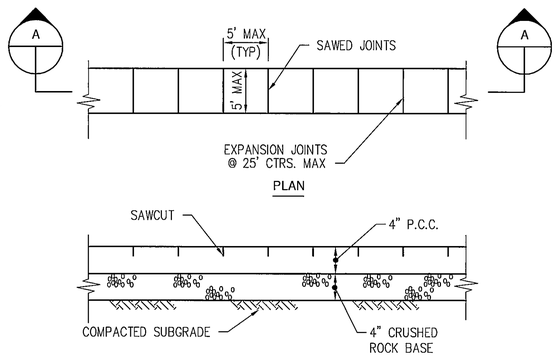
SITE PLAN AND DETAILS

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	

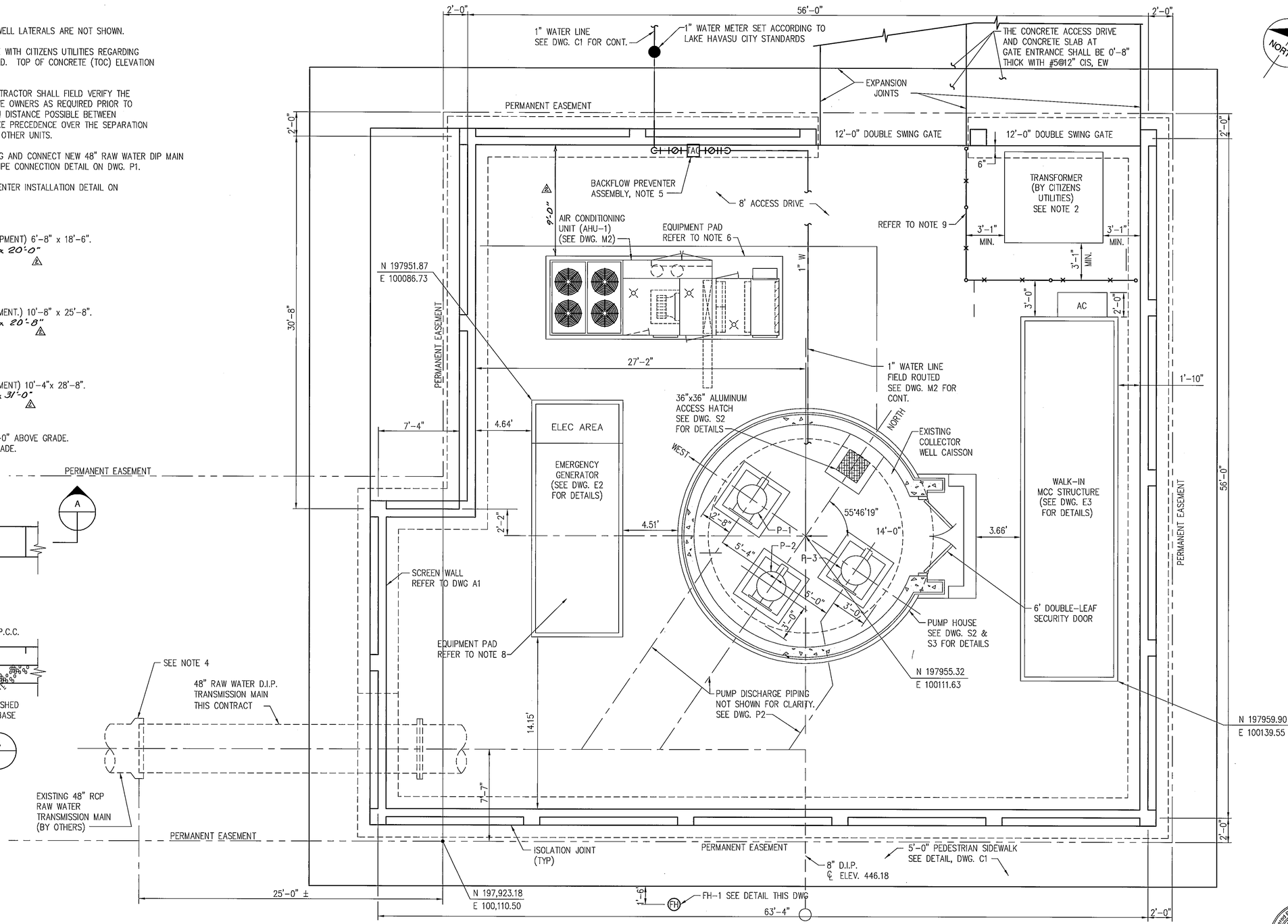
Scale For Microfilming: Millimeters / Inches

NOTES:

1. FOR SAKE OF CLARITY EXISTING HORIZONTAL COLLECTOR WELL LATERALS ARE NOT SHOWN.
2. 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.
3. 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.
4. REMOVE EXISTING 48" HARNESSED 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.
5. SEE WATER SUPPLY AT METER LOCATION BACKFLOW PREVENTER INSTALLATION DETAIL ON DWG. M3.
6. AIR CONDITIONING UNIT FOUNDATION SLAB:
   a. TOP OF CONCRETE ELEVATION 455'-0"
   b. PLAN DIMENSIONS (CONTRACTOR TO VERIFY WITH EQUIPMENT) 6'-8" x 18'-6".
   c. SLAB THICKNESS 1'-0". *DIMENSION- 9'-0" x 20'-0"* (2)
   d. REINFORCING:
      (1) #4@10" EW, TOP W/2" CLEAR COVER.
      (2) #4@10" EW, BOTTOM W/3" CLEAR COVER.
7. EMERGENCY GENERATOR FOUNDATION SLAB:
   a. TOP OF CONCRETE ELEVATION 455'-0".
   b. PLAN DIMENIONS (CONTRACTOR TO VERIFY W/ EQUIPMENT.) 10'-8" x 25'-8".
   c. SLAB THICKNESS 1'-3". *DIMENSION- 8'-0" x 20'-8"* (2)
   d. REINFORCING:
      (1) #5@12" EW, TOP W/ 2" CLEAR COVER.
      (2) #5@12" EW, BOTTOM W/ 3" CLEAR COVER.
8. WALK-IN MCC STRUCTURE FOUNDATION SLAB:
   a. TOP OF CONCRETE ELEVATION ~~454'-0"~~. *454'-4"*
   b. PLAN DIMENSIONS (CONTRACTOR TO VERIFY W/ EQUIPMENT) 10'-4" x 28'-8".
   c. SLAB THICKNESS 1'-0". *DIMENSION- 10'-2" x 31'-0"* (2)
   d. REINFORCING:
      (1) #4@10" EW, TOP W/ 2" CLEAR COVER.
      (2) #4@10" EW, BOTTOM W/3" CLEAR COVER.
9. 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.



TYPICAL SIDEWALK DETAIL
NOT TO SCALE



SITE PLAN
4 2 0 4 8
SCALE IN FEET

"AS-BUILT"

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

Registered Professional Engineer (Civil) CERTIFICATE NO. 27129 STEVEN R. LIMING Date Signed 11-1-01 State of Arizona

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
	8-15-01	JDF	AS-BUILT

Burns & McDonnell SINCE 1898

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

LAKE HAVASU CITY, ARIZONA INCORPORATED 1978

LONDON BRIDGE BEACH PUMP HOUSE

EQUIPMENT LAYOUT

project 97-777-1-002 | contract W-183-00
drawing C2 | rev. ~~1~~ 2
sheet of sheets
file Lbbphc02.dwg 06-14-2000 13:32 LJM

Scale For Microfilming: Millimeters / Inches

STANDARD ELECTRICAL LEGEND

ONE-LINE DIAGRAMS

	POWER CIRCUIT AND EQUIPMENT INSTALLED BY THIS CONTRACT
	EQUIPMENT ENCLOSURE
	CONTROL OR INTERLOCK 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)
(2)	CURRENT TRANSFORMER (2 REQUIRED)
(2)	POTENTIAL TRANSFORMER (2 REQUIRED)
	LIGHTNING OR SURGE ARRESTER
	GROUND CONNECTION
	MOTOR CIRCUIT PROTECTOR WITH AIR CIRCUIT BREAKER AND ADJUSTABLE MAGNETIC ONLY TRIP
	SOLID STATE SINGLE SPEED NON–REVERSING MOTOR STARTER W/CONTROL POWER TRANSFORMER
	COMBINATION AIR CIRCUIT BREAKER AND SINGLE SPEED NON–REVERSING MAGNETIC STARTER W/CONTROL POWER TRANSFORMER
CT	ONE–LINE DIAGRAM SOLID STATE MOTOR CONTROLLER, REDUCED VOLTAGE (SOFT START)

AS	AMMETER SWITCH
VS	VOLTMETER SWITCH
A	AMMETER
V	VOLTMETER
27	UNDERVOLTAGE
46	PHASE REVERSAL
47	PHASE–SEQUENCE VOLTAGE RELAY
49	MOTOR THERMAL RELAY
60	VOLTAGE UNBALANCE
50GS	INSTANTANEOUS GROUND FAULT RELAY
K	KEY OPERATED INTERLOCK
W	GROUND DETECTOR INDICATING LIGHT
GI	GROUND INDICATION LAMP
64	GROUND DETECTION UNDERVOLTAGE RELAY
HP	ELECTRIC MOTOR – APPROXIMATE HORSEPOWER AS INDICATED
(1)	INDICATES NUMBER REQUIRED
15	CAPACITOR (15 KVAR)
	ROTATING MACHINE SURGE PROTECTION
	TERMINAL
	480 VOLT POWER RECEPTACLE
KWH	KILOWATT HOUR METER
RKVAH	REACTIVE KILOVOLT–AMPERE–HOUR METER

PLANS

	NEW CONSTRUCTION
	EXISTING CONSTRUCTION
	EXISTING CONSTRUCTION TO BE REMOVED
	CONDUIT EXPOSED
	CONDUIT CONCEALED IN WALL, CEILING OR HIDDEN FROM VIEW
	CONDUIT CONCEALED IN FLOOR OR UNDERGROUND
	FLEXIBLE CONDUIT
	GROUND CABLE
	GROUND CABLE RISER
	BOLTED GROUND CONNECTION
	WELDED GROUND CONNECTION
	GROUND ROD
	HOME RUN TO PANELS,ARROW HEADS INDICATE NUMBER OF CIRCUITS.
	CONDUIT TURNING UP
	CONDUIT TURNING DOWN
	CONDUIT WITH BUSHING
	CONDUIT TERMINATED OR CAPPED
	POWER PANEL
	LIGHTING PANEL
	DISCONNECT SWITCH
MS	MANUAL MOTOR STARTER
	MAGNETIC MOTOR STARTER

	COMBINATION CIRCUIT BREAKER/MAGNETIC MOTOR STARTER
M	MOTOR
P	PULL BOX
J J	JUNCTION BOX
	EXIT LIGHT
L–1	FLUORESCENT LUMINAIRE WITH LUMINAIRE TYPE (L–1)
L–1 L–1	INCANDESCENT OR H.I.D. LUMINAIRE WITH LUMINAIRE TYPE (L–1)
	EMERGENCY LIGHTING UNIT
	PHOTOCELL LIGHTING CONTROL
	SURFACE MOUNTED DUPLEX RECEPTACLE OUTLET; SEE SPECIFICATIONS "WP" DENOTES WEATHERPROOF; SEE SPECIFICATIONS "GFI" DENOTED GROUND FAULT INTERRUPTER; SEE SPECIFICATIONS
	480V POWER RECEPTACLE
	CONTROL DEVICE AS INDICATED
	TORQUE SWITCH
C	POWER FACTOR CORRECTION CAPACITOR
T	THERMOSTAT
S	SINGLE POLE SWITCH
S_3	THREE–WAY SWITCH
S_4	FOUR–WAY SWITCH
	POWER POLE

SCHEMATIC DIAGRAM DEVICE DESIGNATIONS

	DESIGNATION DESCRIBING DEVICE OPERATION OR FUNCTION
A AUTO	AUTOMATIC
CL	CLOSE
HI	HIGH
H	HAND
LCL	LOCAL
L	LOW
HR	HAND RESET
HS	HIGH SPEED
LS	LOW SPEED
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
RMT	REMOTE
OP	OPEN
O	OFF
INST	INSTANTANEOUS
FWD	FORWARD
REV	REVERSE
ACK	ACKNOWLEDGE
	DEVICE DESIGNATIONS
AL	ALARM RELAY OR ALARM TIMER
ANN	ANNUNCIATOR
CB	CIRCUIT BREAKER
CNTOR	CONTACTOR
CR	CONTROL RELAY
CS	CONTROL SWITCH
CT	CYCLE TIMER
ES	ELECTRONIC SWITCH
F/I	FREQUENCY TO CURRENT TRANSDUCER
F/MV	FREQUENCY TO MILLIVOLT TRANSDUCER
FSR	FREQUENCY TO SHIFT TONE TRANSDUCER
FST	FREQUENCY SHIFT TONE TRANSDUCER
FLS	FLOW SWITCH
FS	FLOAT SWITCH
FU	FUSE
IL	INDICATING LIGHT
IPB	ILLUMINATED PUSHBUTTON
ISS	ILLUMINATED SELECTOR SWITCH
I/P	CURRENT TO PRESSURE TRANSDUCER

I/I	CURRENT TO CURRENT TRANSDUCER
LS	LIMIT SWITCH
LLS	LIQUID LEVEL SWITCH
M	MOTOR STARTER COIL OR CONTACT
MT	MOTOR TEMPERATURE
MV/I	MILLIVOLT TO CURRENT TRANSDUCER
MX	MOTOR STARTER AUXILIARY RELAY
OL	OVERLOAD RELAY
PB	PUSHBUTTON
PS	PRESSURE SWITCH
SOL	SOLENOID (OTHER THAN VALVE)
SV	SOLENOID VALVE
SR	SOLID STATE SCANNER RECEIVER
SS	SELECTOR SWITCH
ST	SOLID STATE SCANNER TRANSMITTER
SPB	SELECTOR PUSHBUTTON
XFMR	TRANSFORMER
T	THERMOSTAT
TR	TIME DELAY RELAY
TS	TORQUE SWITCH
VS	VACUUM SWITCH
TMR	TIMER
ETM	ELASPED TIME METER
EP	ELECTRIC–PNEUMATIC
FD	FLUID DETECTOR

1 B — CIRCLED NUMBER IS THE SAME NUMBER AS APPEARS AFTER THE HYPEN IN THE "CIRCUIT NUMBER"; WIRE COLOR DESIGNATION: B=BLACK; R=RED; ETC

DEVICE CALLOUT
3–CR2 — DEVICE IDENTIFICATION; DEVICE DESIGNATION; DIAGRAM NUMBER

CONTACT CALLOUT
CR1 — DEVICE INDENTIFICATION; DEVICE DESIGNATION

NOTE: NO DIAGRAM NUMBER INDICATES SAME AS SCHEMATIC DIAGRAM NUMBER

INSTRUMENTATION

	MEASURING INSTRUMENT
	DUAL FUNCTION INSTRUMENT OR INSTRUMENTS
	ULTRASONIC TRANSDUCER
	PRESSURE TRANSDUCER
	DIFFERENTIAL PRODUCING FLOW TUBE
	ULTRASONIC FLOW METER
	FIELD MOUNTED INSTRUMENT
	INSTRUMENT MOUNTED BEHIND PANEL FACE
	INSTRUMENT MOUNTED ON PANEL FACE
XX (XX–X)	FLOW METER
AI	ANALOG INPUT TO PLC
AO	ANALOG OUTPUT FROM PLC
DI	DIGITAL INPUT TO PLC
DO	DIGITAL OUTPUT FROM PLC

PROCESS VARIABLE LETTER CODE

Σ	SUMMING
+–	BIAS
Σ/n	AVERAGING
F(X)	CALCULATING
√	SQUARE ROOT EXTRACTING
∫	INTEGRATE
I/P	CURRENT TO PRESSURE
P/I	PRESSURE TO CURRENT
I/I	CURRENT TO CURRENT
I/PD	CURRENT TO PULSE DURATION
I/F	CURRENT TO FREQUENCY
F/I	FREQUENCY TO CURRENT
E/I	VOLTAGE TO CURRENT
R/I	RESISTANCE TO CURRENT
CL	CHLORINE
F	FLOW
pH	pH
ORP	OXIDATION REDUCTION POTENTIAL
T	TEMPERATURE
TB	TURBIDITY

FT 3 — F FT 3 = FLOW INDICATING
1 2 3 TRANSMITTER NO.3
1 PROCESS VARIABLE
2 FUNCTION
3 NUMBER

	FIRST LETTER	SUCCEEDING LETTERS
A	ANALYSIS	ALARM
C	CONDUCTIVITY	CONTROL
D	DENSITY	DIFFERENTIAL
E	VOLTAGE	PRIMARY ELEMENT
F	FLOW	RATIO (FRACTION)
H	HAND	HIGH
I	CURRENT	INDICATOR
K	TIME	
L	LEVEL	LOW
M	MOISTURE	
P	PRESSURE	
Q	QUANTITY	TOTALIZE OR INTEGRATE
R	RADIOACTIVITY	RECORD
S	SPEED	SWITCH
T	TEMPERATURE	TRANSMITTER
V	VISCOSITY	VALVE
W	WEIGHT	
Y		RELAY OR COMPUTE
Z	POSITION	

SCHEMATIC DRAWINGS

A + B	(A) CONDUCTOR CONNECTION (B) NO CONNECTION
	CONTACT–NORMALLY OPEN
	CONTACT–NORMALLY CLOSED
	SWITCH AS DESIGNATED ON DIAGRAM
	SELECTOR SWITCH
	PUSHBUTTON–NORMALLY OPEN MOMENTARY
	PUSHBUTTON NORMALLY CLOSED MOMENTARY
	PUSHBUTTONS–MAINTAINED CONTACT
	PRESSURE OR VACUUM SWITCH–CLOSES WITH INCREASING PRESSURE OR DECREASING VACUUM
	PRESSURE OR VACUUM SWITCH–OPENS WITH INCREASING PRESSURE OR DECREASING VACUUM
	FLOW SWITCH–CLOSES WITH INCREASING FLOW
	FLOW SWITCH OPENS WITH INCREASING FLOW
	FLOAT OR OTHER LIQUID LEVEL SWITCH–CLOSES WITH RISING LEVEL
	FLOAT OR OTHER LIQUID LEVEL SWITCH–OPENS WITH RISING LEVEL
	TEMPERATURE SWITCH–CLOSES WITH RISING TEMPERATURE
	TEMPERATURE SWITCH– OPENS WITH RISING TEMPERATURE
H O A	HAND–OFF–AUTO SELECTOR SWITCH

A B	(A) LIMIT SWITCH–NORMALLY OPEN (B) LIMIT SWITCH–NORMALLY OPEN–HELD CLOSED
A B	(A) LIMIT SWITCH–NORMALLY CLOSED (B) LIMIT SWITCH–NORMALLY CLOSED–HELD OPEN
M	COIL OR TIMING MODULE
GFI	DUPLEX RECEPTACLE OUTLET "GFI" DENOTES GROUND FAULT INTERRUPTER
	FUSE
RES	RESISTANCE OR HEATING ELEMENT
O.L.(3)	THERMAL OVERLOAD RELAY
R	INDICATING LIGHT–PILOT TYPE WITH COLOR INDICATED R–RED,A–AMBER,G–GREEN,W–WHITE, BL–BLUE,I–IVORY,AND Y–YELLOW.
	NORMALLY OPEN TIME DELAY CONTACT. CONTACT CLOSES ON TIME DELAY AFTER ENERGIZATION OF RELAY COIL
	NORMALLY CLOSED TIME DELAY CONTACT. CONTACT OPENS ON TIME DELAY AFTER ENERGIZATION OF RELAY COIL
	NORMALLY OPEN TIME DELAY CONTACT. CONTACT CLOSES UPON ENERGIZATION OF RELAY COIL CONTACT OPENS ON TIME DELAY AFTER DE–ENERGIZATION OF RELAY COIL
	NORMALLY CLOSED TIME DELAY CONTACT. CONTACT OPENS UPON ENERGIZATION OF RELAY COIL. CONTACT CLOSES ON TIME DELAY AFTER DE–ENERGIZATION OF RELAY COIL
	TORQUE SWITCH
H	ALARM HORN

	TERMINAL
	SOLENOID VALVE
	EQUIPMENT ENCLOSURE
	TRANSFORMER
	GROUND
	LOCAL WIRING
	REMOTE WIRING

"AS-BUILT"

ABBREVIATIONS

AFG	ABOVE FINISHED GRADE
A.F.F.	ABOVE FINISHED FLOOR
ATS	AUTOMATIC TRANSFER SWITCH
C	CONDUIT
WP	WEATHERPROOF
EXP	EXPLOSION–PROOF (CLASS 1, DIV 1, GROUP D)
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
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.

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

Registered Professional Engineer Civil
CERTIFICATE NO.
27129
STEVEN R. LIMING
Date Signed 11-1-01
STATE OF ARIZONA

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

Burns & McDonnell SINCE 1898

date NOV. 12, 1999	detailed M. J. NEWTON
designed T. MOLL	checked E.L.T.

LAKE HAVASU CITY, ARIZONA INCORPORATED 1978

LONDON BRIDGE BEACH PUMP HOUSE

ELECTRICAL LEGEND

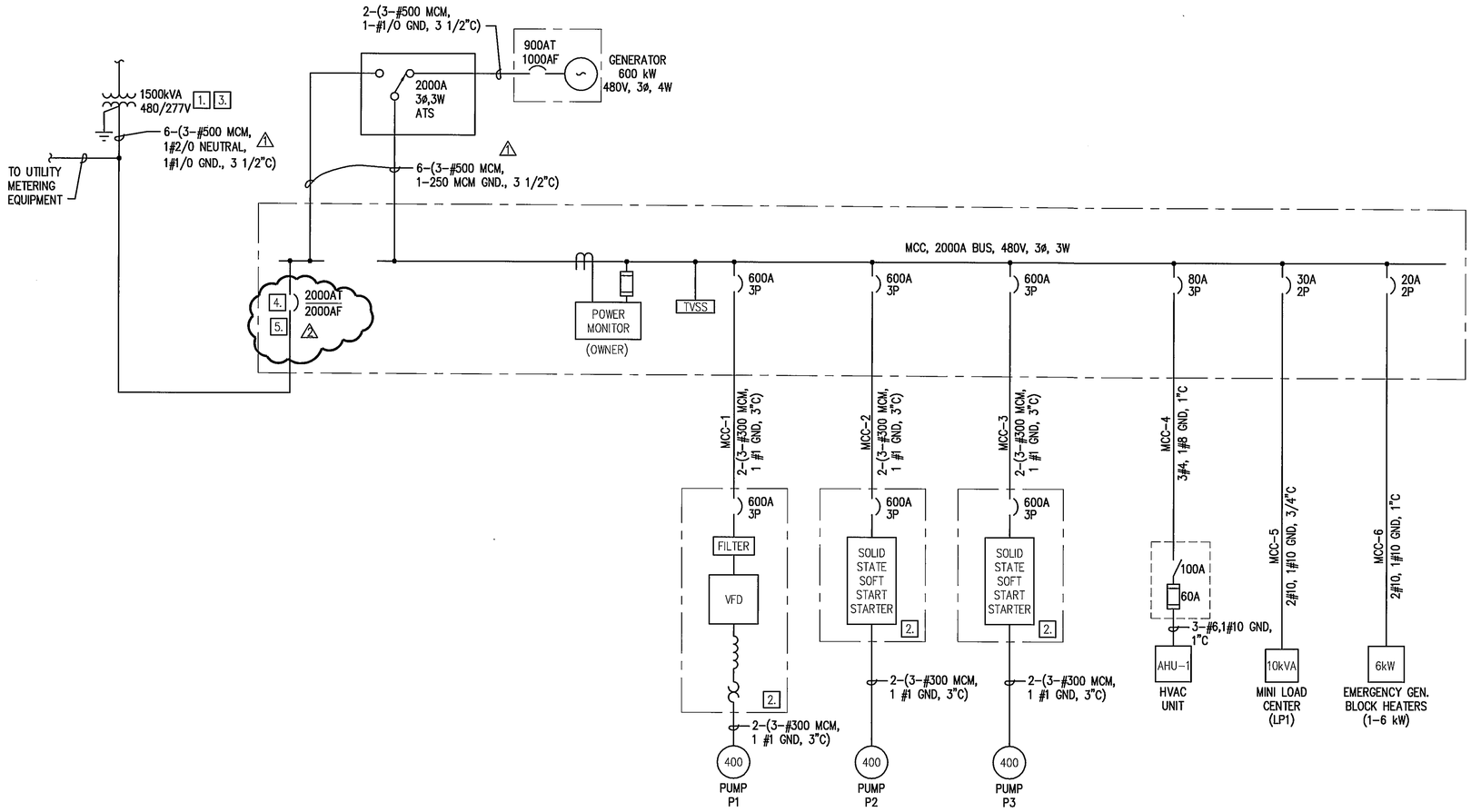
project 97-777-1-002	contract W-183-00
drawing E1	rev. –
sheet 15 of 21 sheets	
file Lbbphe01.dwg 03-20-2000 15:40 JRR	

Scale For Microfilming: Millimeters / Inches

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. (2)

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 ø A	LOAD - VA ø B	POLE NO.	CIRCUIT NO.	TRIP AMPS	WIRE SIZE	LOAD SERVED
1	LP1-1	20	12	RECEPTACLES	1080		2	LP1-2	20	12	BLDG LIGHTING
3	LP1-3	20	12	FAN EF-1 AND LOUVER	900	800	4	LP1-4	20	12	AREA LIGHTING
5	LP1-5	20	12	INSTRUMENTATION	500	1600	6	LP1-6	20	12	LIT-1
7	LP1-7	20	12	SCADA SYSTEM	50	500	8	LP1-8	20	12	EMERG. GENERATOR BATT. CHARGER
9		–		SPARE		250	10		–		SPARE
				TOTAL CONNECTED LOAD: 23.5 AMPERES 5.6 KVA	2530	3150					

"AS-BUILT"

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

Registered Professional Engineer (Civil) CERTIFICATE NO. 27129 STEVEN R. LIMING Date Signed 11-10-01

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

Burns & McDonnell SINCE 1898

date NOV. 11, 1999 | detailed M. J. NEWTON

designed T. MOLL | checked E.L.T.

LAKE HAVASU CITY, ARIZONA INCORPORATED 1978

LONDON BRIDGE BEACH PUMP HOUSE

ELECTRICAL ONE-LINE DIAGRAM

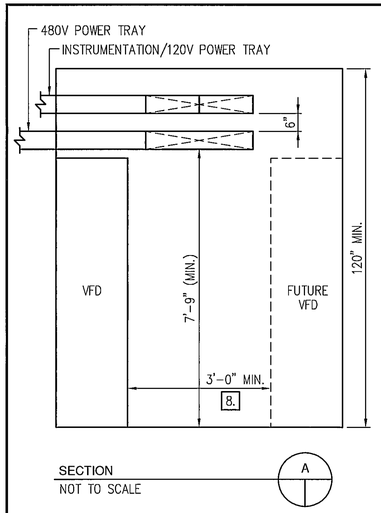
project 97-777-1-002 | contract W-183-00

drawing E2 | rev. – 2

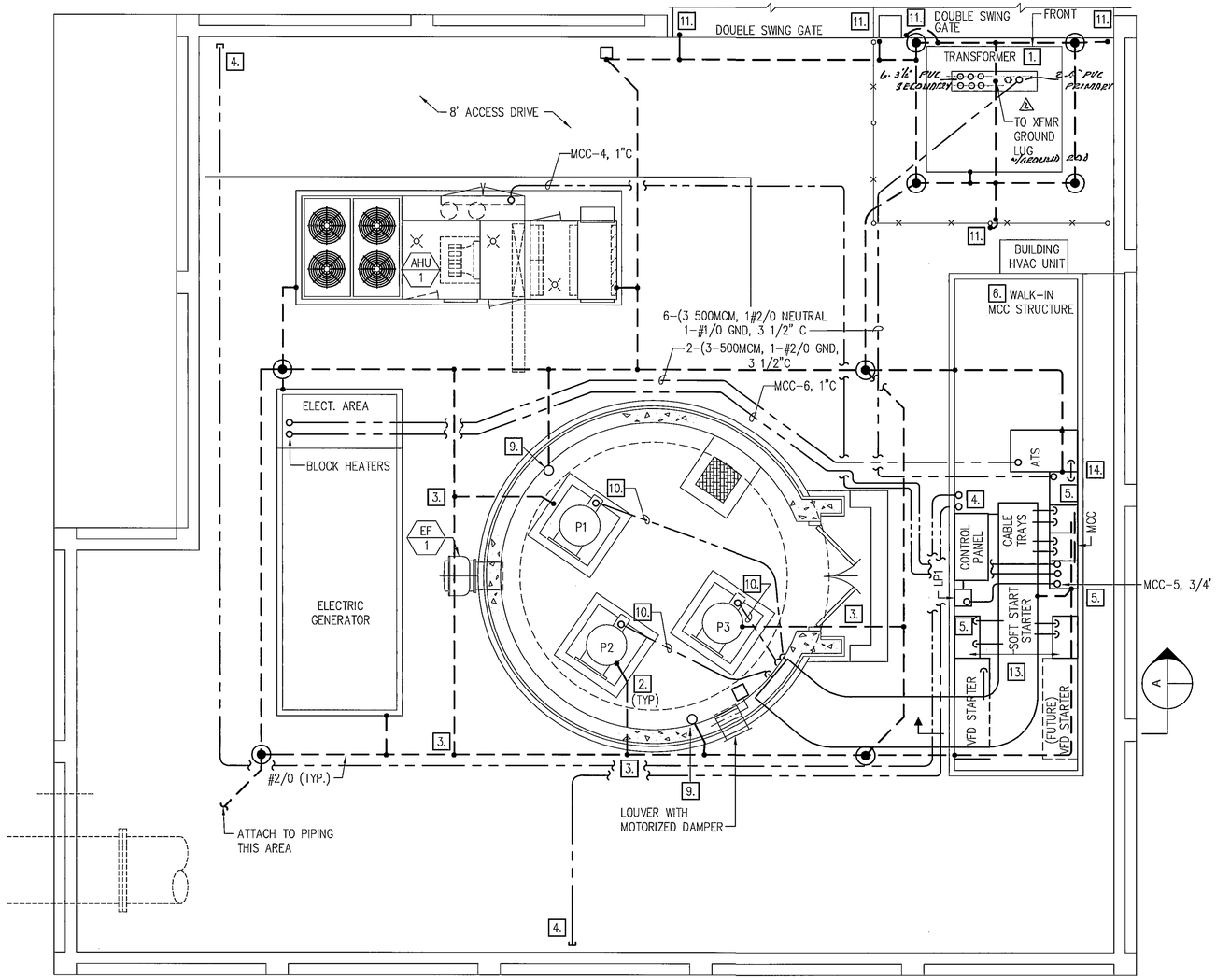
sheet 16 of 21 sheets

file lbbphe02.dwg 01-03-2001 15:00 DHD

Scale For Microfilming: Millimeters / Inches



SECTION A
NOT TO SCALE



POWER PLAN
4 2 0 4 8
SCALE IN FEET

NORTH

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.

"AS-BUILT"

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

Registered Professional Engineer (Civil)
CERTIFICATE NO.
27129
STEVEN R. LIMING
Date Signed 11/1/01
ARIZONA U.S.A.

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
	8-15-01	JDF	AS-BUILT

Burns & McDonnell SINCE 1898

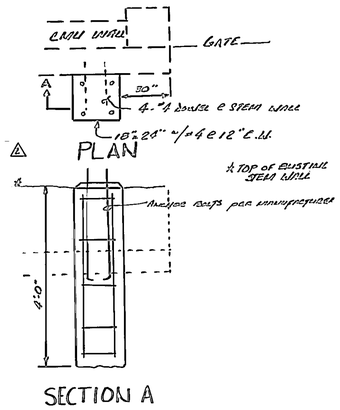
date DECEMBER, 26, 2000 | detailed D.DOMBROSKI
designed T. MOLL | checked E.L.T.

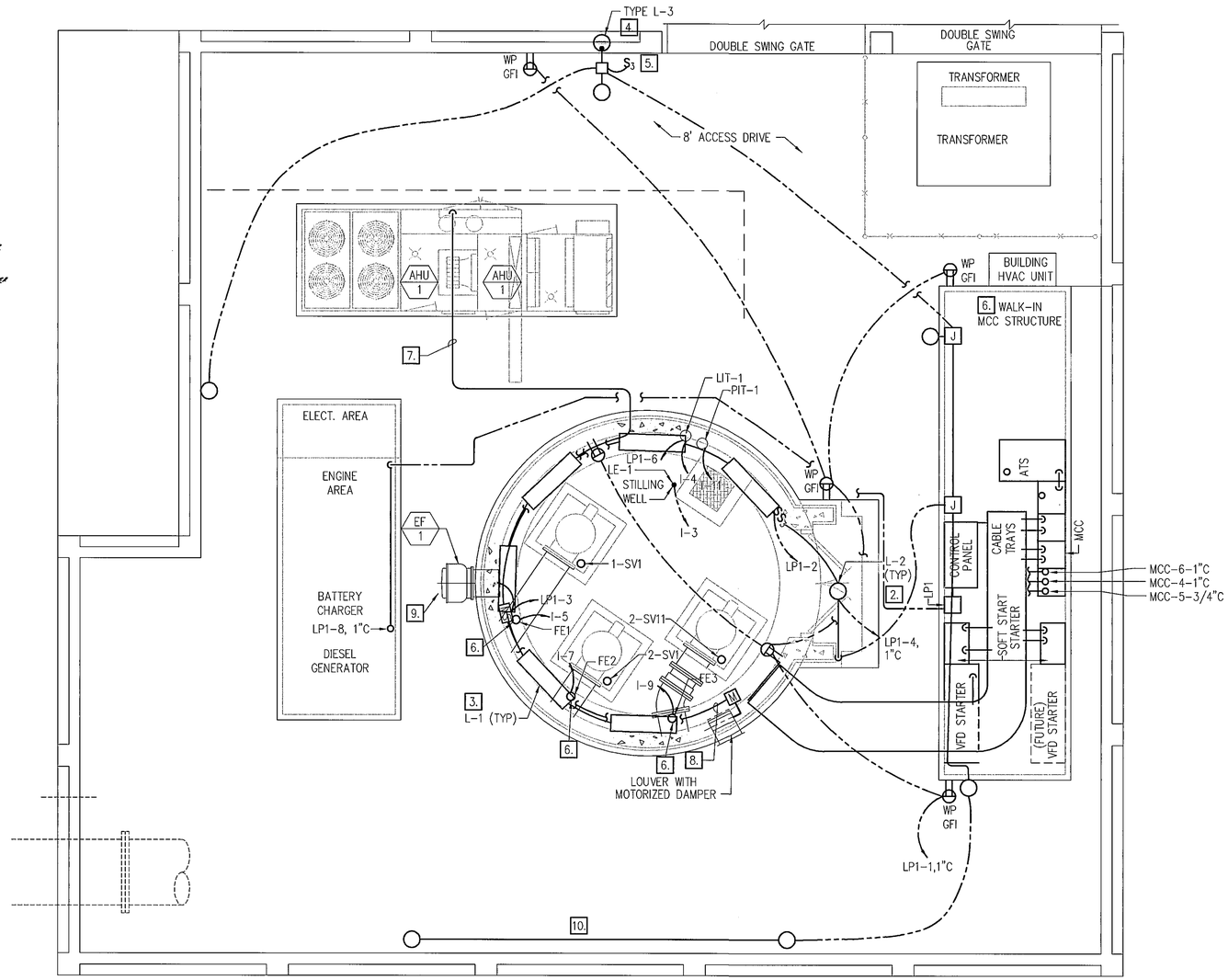
LAKE HAVASU CITY, ARIZONA INCORPORATED 1978

LONDON BRIDGE BEACH PUMP HOUSE
ELECTRICAL POWER PLAN

project 97-777-1-002 | contract W-183-00
drawing E3 | rev. – ~~1~~ 2
sheet 17 of 21 sheets
file Lbbphe3A.dwg 01-02-2001 11:14 DHD

Scale For Microfilming
Millimeters
Inches





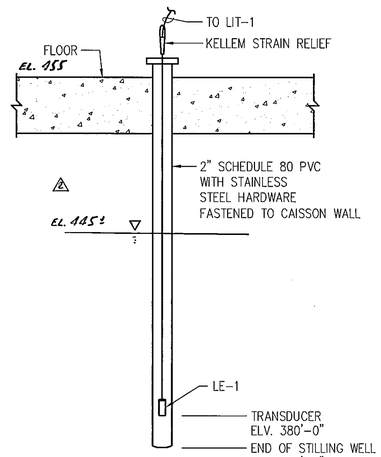
LIGHTING, SMALL POWER AND CONTROL PLAN

4 2 0 4 8

SCALE IN FEET

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.



STILLING WELL DETAIL

"AS-BUILT"

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

Registered Professional Engineer Certificate No. 27129 STEVEN R. LIMING On Signed 11-1-01

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.
	8-15-01	JDF	AS-BUILT

Burns & McDonnell SINCE 1898

date DECEMBER 27, 2000 | detailed D.DOMBROSKI

designed T. MOLL | checked E.L.T.

LAKE HAVASU CITY, ARIZONA INCORPORATED 1978

LONDON BRIDGE BEACH PUMP HOUSE

ELECTRICAL LIGHTING, SMALL POWER AND CONTROL PAN

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

drawing E4 | rev. -

sheet 18 of 21 sheets

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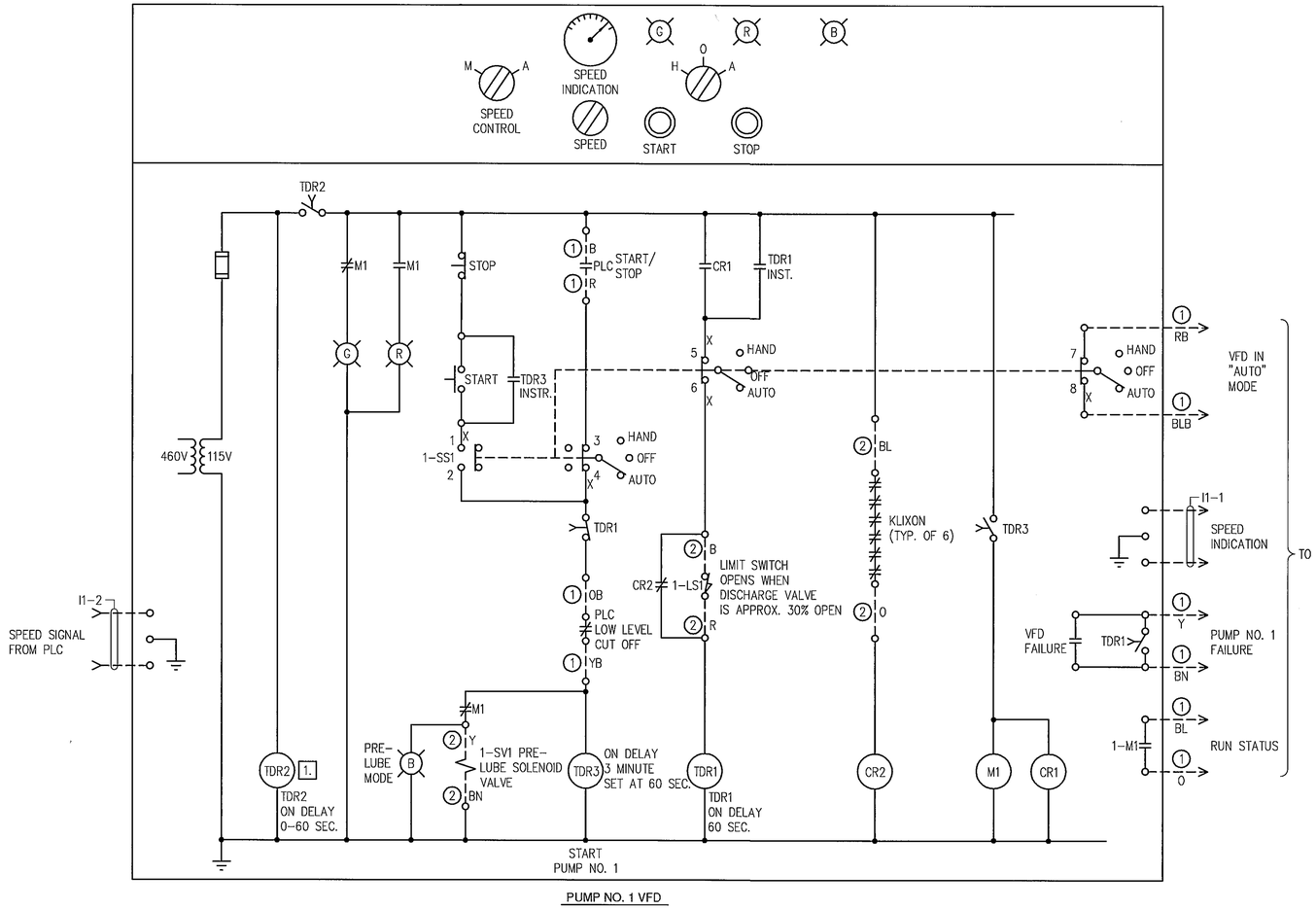
Scale For Microfilming: Millimeters / Inches



PUMP NO. 1 VFD

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.

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 FROM	CONNECTIONS TO	FUNCTION
C1-1		PUMP NO. 1 VFD	PUMP STATION PLC	
	B			CONTROL
	R			
	BL			RUN STATUS
	O			
	Y			FAILURE
	BN			ALARM
	RB			INDICATION
	BLB			
	OB			CONTROL
	YB			
	BNB			SPARE
	BR			
C1-2		PUMP NO. 1 VFD	MOTOR NO. 1	
	B			CONTROL
	R			
	BL			CONTROL
	O			
	Y			PRE-LUBE
	BN			
	RB			SPARE
I1-1		PUMP NO. 1 VFD	PUMP STATION PLC	
	ONE			SPEED
	PAIR			INDICATION
I1-2		PLC	PUMP NO. 1 VFD	
	ONE			SPEED
	PAIR			CONTROL

"AS-BUILT"

1

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

Registered Professional Engineer (Civil)
CERTIFICATE NO. 27129
STEVEN R. LIMING
Date Signed 11-1-01
Arizona U.S.A.

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

Burns & McDonnell SINCE 1898

date NOV. 23, 1999 | detailed J. RECKART

designed T. MOLL | checked E.L.T.

LAKE HAVASU CITY, ARIZONA INCORPORATED 1978

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

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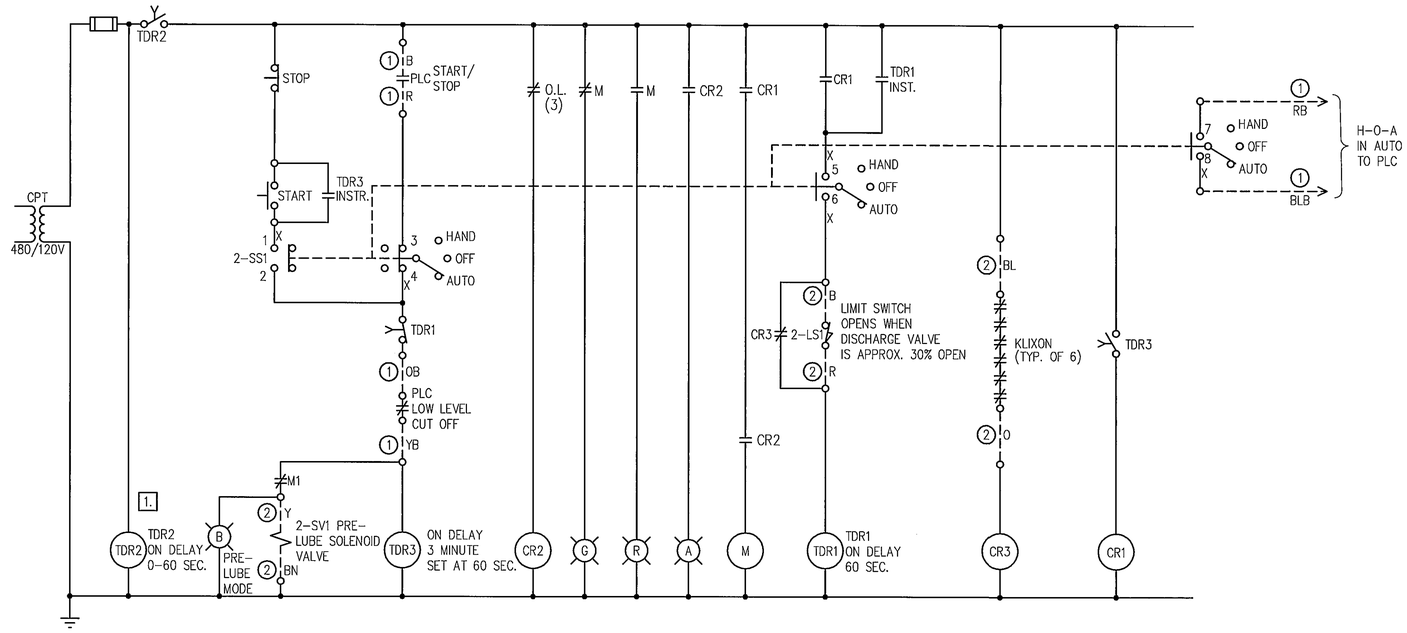
Scale For Microfilming
Millimeters
Inches



PUMP NO. 2 MOTOR STARTER

(TYPICAL FOR PUMP NO. 3)

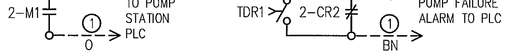


TABLE OF CORRESPONDING DEVICES AND CIRCUITS										
	DEVICES								CIRCUITS	
PUMP NO. 2	2-TDR1	2-TDR2	2-CR1	2-CR2	2-CR3	2-SS1	2-LS1	2-SV1	C2-1	C2-2
PUMP NO. 3	2-TDR11	2-TDR12	2-CR11	2-CR12	2-CR13	2-SS11	2-LS11	2-SV11	C2-11	C2-12

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.

CONTACT DEVELOPMENT CONTROL SELECTOR SWITCH SS1 AND SS11			
CONTACTS	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.

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

"AS-BUILT"

2

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

Registered Professional Engineer (Civil) CERTIFICATE NO. 27129 STEVEN R. LIMING Date Signed 11-1-01

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

Burns & McDonnell SINCE 1898

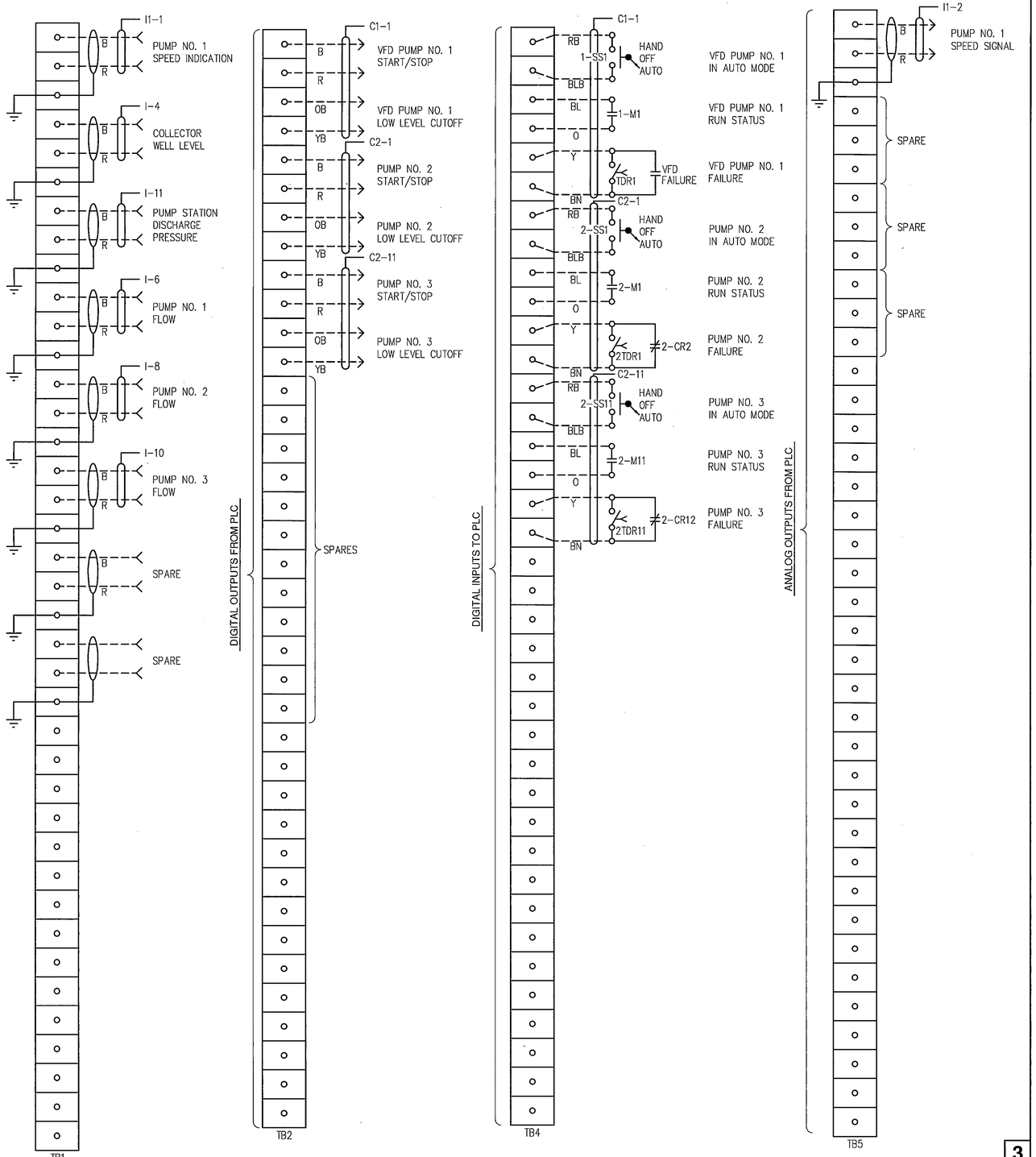
date NOV. 23, 1999 | detailed J. RECKART
designed T. MOLL | checked E.L.T.

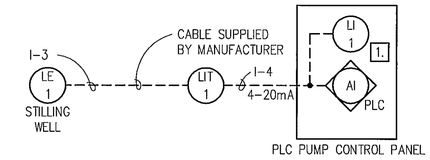
LAKE HAVASU CITY, ARIZONA INCORPORATED 1978

LONDON BRIDGE BEACH PUMP HOUSE
PUMP CONTROL
DIAGRAMS NO. 2

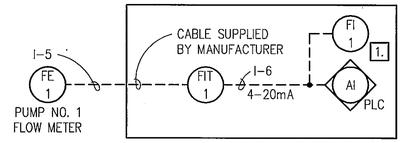
project 97-777-1-002 | contract W-183-00
drawing E6 | rev. –
sheet 20 of 21 sheets
file Lbbphe06.dwg 03-21-2000 11:31 LJM

Scale For Microfilming: Millimeters / Inches

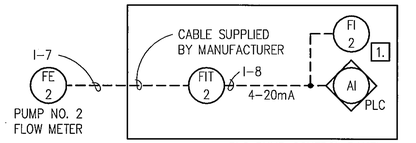




COLLECTOR WELL LEVEL



PUMP NO. 1 FLOW



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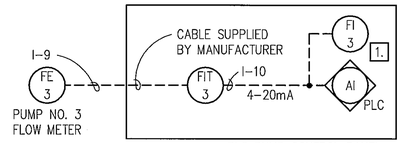

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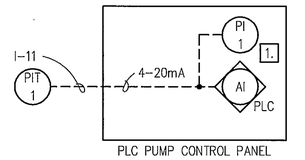
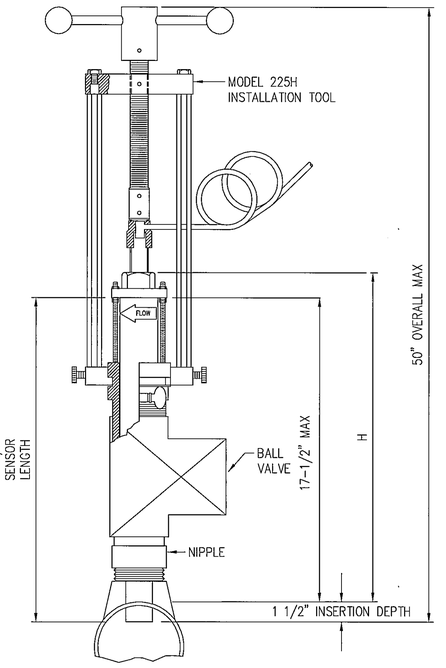


PUMP STATION DISCHARGE PRESSURE

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.

TYPICAL FLOW SENSOR MOUNTING DETAIL
NOT TO SCALE

"AS-BUILT"

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(OUTSIDE MARICOPA COUNTY)
1-800-782-5348

Registered Professional Engineer (Civil)
CERTIFICATE NO.
27129
STEVEN R. LIMING
Date Signed 11-1-01
ARIZONA U.S.A.

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

3

Burns & McDonnell SINCE 1898

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

LAKE HAVASU CITY, ARIZONA · INCORPORATED 1978

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 MJN	

Scale For Microfilming: Millimeters / Inches

PIPING

- GATE VALVE
- GLOBE VALVE
- BUTTERFLY VALVE
- CHECK VALVE
- STOP CHECK VALVE
- AUTOMATIC RECIRCULATION CHECK VALVE
- PLUG VALVE
- 3-WAY PLUG VALVE (2-PORT)
- 3-WAY PLUG VALVE (3-PORT)
- 4-WAY PLUG VALVE (4-PORT)
- 3-WAY VALVE
- ANGLE VALVE
- RELIEF OR SAFETY VALVE
- HOSE GATE DRAIN VALVE
- PINCH VALVE
- NEEDLE VALVE
- DIAPHRAGM VALVE
- BALL VALVE
- (P) SELF-CONTAINED PRESSURE REDUCING (REGULATING VALVE)
- (SR) SURGE RELIEF VALVE
- KNIFE GATE VALVE
- CORPORATION STOP
- AIR RELEASE VALVE
- VACUUM VALVE
- AV AIR AND VACUUM VALVE
- LOCKED OPEN
- LOCKED CLOSED

- BP BACKFLOW PREVENTER
- VB VACUUM BREAKER
- MS MOISTURE SEPARATOR
- M IN-LINE FLOW METER
- SIGHT FLOW INDICATOR
- FLEXIBLE HOSE
- EXPANSION ELEMENT (JOINT)
- Y-TYPE STRAINER
- PIPE WITH HEATING CABLE
- UNION
- REDUCER
- REMOVABLE PLUG
- REMOVABLE CAP
- WELDED CAP
- BF BLIND FLANGE
- CO CLEANOUT
- YH YARD HYDRANT
- AC AIR COCK
- HB HOSE BIBB
- WH WALL HYDRANT
- QUICK DISCONNECT COUPLING
- EXHAUST TO ATMOSPHERE (INSIDE)
- EXHAUST TO ATMOSPHERE (OUTSIDE)

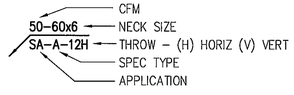
VALVE OPERATORS

- C CYLINDER
- D DIAPHRAGM
- M MOTOR
- S SOLENOID
- D DIAPHRAGM WITH HANDWHEEL
- CHAINWHEEL
- F FLOAT

HEATING, VENTILATION AND AIR CONDITIONING

- C C COOLING COIL
- H C HEATING COIL
- DAMPER
- FLEXIBLE DUCT CONNECTION
- RECTANGULAR ELBOW W/ TURNING VANES (INDICATES TURNING VANES)
- TEE W/TURNING VANES
- ADJUSTABLE EXTRACTING DEVICE
- ADJUSTABLE SPLITTER DAMPER
- R RISE IN RESPECT TO AIR FLOW
- D DROP IN RESPECT TO AIR FLOW
- SPLITTER DAMPER (ADJUSTABLE)
- SQUARE OR RECTANGULAR TO ROUND TRANSITION
- SUPPLY OR OUTSIDE AIR DUCT SECTION
- RETURN OR EXHAUST AIR DUCT SECTION
- CEILING DIFFUSER (W/BLANK OFF PLATE INDICATED)
- SIDEWALL (RA OR EA) REGISTER OR GRILLE
- SIDEWALL (SA) REGISTER OR GRILLE
- (3'-0") FINNED TUBE RADIATION - LENGTH OF ELEMENT SHOWN
- SQUARE OR RECTANGULAR DIFFUSER
- ROUND DIFFUSER
- LINEAR OR SLOT DIFFUSER
- ROUND FLEXIBLE DUCT

AIR DISTRIBUTION DEVICE IDENTIFICATION



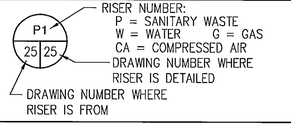
- DP DEWPOINT TRANSMITTER/SENSOR
- SP STATIC PRESSURE TRANSMITTER/SENSOR
- TT TEMPERATURE TRANSMITTER/SENSOR
- MOTOR STARTER
- SS AIR FLOW SWITCH (SAIL SWITCH)
- M DAMPER MOTOR
- PE PNEUMATIC ELECTRIC SWITCH
- SW SELECTOR SWITCH
- PS POSITION SWITCH
- P POSITIONER
- RC RECEIVER CONTROLLER
- EP ELECTRIC PNEUMATIC SWITCH
- FS FREEZESTAT
- CD COMBUSTION DETECTOR
- C CONTROLLER
- M MANOMETER
- TS TEMPERATURE SENSOR
- A MAIN AIR SUPPLY
- TG TEMPERATURE GAUGE
- PG PRESSURE GAUGE
- H HUMIDISTAT
- INDICATING LIGHT
- DPS DIFFERENTIAL PRESSURE SWITCH
- DPI DIFFERENTIAL PRESSURE INDICATOR
- Tc THERMOSTAT, SYMBOL - L - LOCAL ADJ; C - CONCEALED ADJ; A - AVERAGING; G - GUARD
- TIC TEMPERATURE INDICATING CONTROLLER
- SVA SAFETY VALVE ALARM
- CR CURRENT RELAY SWITCH
- VS VARIABLE SPEED CONTROLLER

PLUMBING

- SH SHOWER
- MB MOP BASIN
- LS LABORATORY SINK
- EWC ELECTRIC WATER COOLER
- WH WATER HEATER
- WC WATER CLOSET (FLUSH VALVE TYPE)
- WC WATER CLOSET (TANK TYPE)
- U URINAL
- L LAVATORY
- ES/EW EMERGENCY SHOWER AND EYEWASH
- ES EMERGENCY SHOWER
- EW EMERGENCY EYEWASH
- CS CUP SINK
- AC AIR COMPRESSOR
- AD AIR DRYER
- VAC VACUUM PUMP

- 4"FD-A FLOOR DRAIN - SIZE - SPEC TYPE
- 4"ED-A EQUIPMENT DRAIN - SIZE - SPEC TYPE
- 4"RD-A ROOF DRAIN - SIZE - SPEC TYPE
- WHA WATER HAMMER ARRESTOR
- P&T PRESSURE/TEMPERATURE RELIEF VALVE
- COLD WATER (CW)
- HOT WATER (HW)
- DEIONIZED WATER (DIW)
- HOT WATER RECIRCULATING (HWR)
- GAS (G)
- COMPRESSED AIR (CA)
- SOIL OR WASTE (ABOVE GRADE)
- SOIL OR WASTE (BELOW GRADE)
- V VENT
- VTR VENT THROUGH ROOF
- RD ROOF DRAIN (ABOVE GRADE)
- RD ROOF DRAIN (BELOW GRADE)

PLUMBING RISER IDENTIFICATION



INSTRUMENTS

- FLOW METERING ELEMENT
- GG - GAUGE GLASS
- LI - LEVEL INDICATOR
- LC - LEVEL CONTROLLER
- LLS - LIQUID LEVEL SWITCH
- LX - LEVEL TRANSMITTER
- FI - FLOW INDICATOR
- FC - FLOW CONTROLLER
- FS - FLOW SWITCH
- FX - FLOW TRANSMITTER
- T - THERMOMETER
- TC - THERMOCOUPLE
- TCT - TEMPERATURE CONTROLLER
- TS - TEMPERATURE SWITCH
- TX - TEMPERATURE TRANSMITTER
- RTD - RESISTANCE TEMPERATURE DETECTOR
- TC - TEST CONNECTION
- PT - PRESSURE TAP

- P (OR) P - PRESSURE GAUGE
- PC - PRESSURE CONTROLLER
- PS - PRESSURE SWITCH
- PX - PRESSURE TRANSMITTER
- V - VACUUM GAUGE
- P - DIFFERENTIAL PRESSURE GAUGE
- PC - DIFFERENTIAL PRESSURE CONTROLLER
- PS - DIFFERENTIAL PRESSURE SWITCH
- PX - DIFFERENTIAL PRESSURE TRANSMITTER
- S SAMPLE CONNECTION
- CONTROL FUNCTION LINE
- AE ANALOG ELEMENT
- AC ANALOG CONTROLLER
- HS HAND SWITCH

GENERAL LEGEND

- CONNECT TO EXISTING

NOTE:

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

FIRE PROTECTION

- 6" ASR AUTOMATIC SPRINKLER RISER
- STANDARD UPRIGHT SPRINKLER HEAD
- PENDANT TYPE SPRINKLER HEAD
- OPEN SPRINKLER HEAD (NO FUSIBLE LINK)
- PENDANT HEAD MOUNTED ON CEILING
- UPRIGHT SPRINKLER ON RISER NIPPLE
- SIDEWALL SPRINKLER HEAD (H) HORIZONTAL
- SPRAY (FOG) VALVE
- AV ALARM VALVE
- DPV DRY PIPE VALVE
- DRY PIPE VALVE W/ACCELERATOR OR EXHAUSTER
- (DV) DELUGE VALVE (PV) PREACTION VALVE (FV) FLOW CONTROL VALVE

VALVE OPERATORS

- PIV POST INDICATOR VALVE
- PIV WALL TYPE POST INDICATOR VALVE (S) SUPERVISED (R) RECESSED
- O S & Y OUTSIDE SCREW AND YOKE VALVE (S) SUPERVISED

FIRE DEPARTMENT PUMPER CONNECTIONS

- FDPC YARD TYPE FREE STANDING
- FDPC WALL MOUNTED
- FDPC FLUSH MOUNTED

FIRE HOSE STATIONS

- FHC IN SURFACE MOUNTED CABINET
- FHC IN RECESSED CABINET
- FHR FIRE HOSE RACK
- FHRL FIRE HOSE REEL

FIRE EXTINGUISHERS

- FE SURFACE MOUNTED
- FHC IN RECESSED CABINET
- FHC IN SURFACE MOUNTED CABINET

ALARM AND DETECTION EQUIPMENT

- S SMOKE DETECTOR
- I IONIZATION DETECTOR
- T THERMAL DETECTOR
- R RATE COMPENSATING DETECTOR
- W CONTINUOUS WIRE DETECTOR
- RR RATE OF RISE DETECTOR (E) ELECTRIC (P) PNEUMATIC
- P PHOTOELECTRIC DETECTOR
- FAP FIRE ALARM CONTROL PANEL
- FAA FIRE ALARM ANNUNCIATOR
- ELECTRIC ALARM BELL
- H HORN
- S SIREN

- F FIRE ALARM MANUAL PULL STATION
- CENTRIFUGAL FIRE PUMP (D) - DIESEL DRIVE (E) - ELECTRIC DRIVE
- VERTICAL TURBINE FIRE PUMP (D) - DIESEL DRIVE (E) - ELECTRIC DRIVE
- PM PUMP FLOW METER
- PUMP HOSE TEST HEADER (-2 1/2" VALVES) NUMBER REQUIRED
- WALL HYDRANT (WH) FLUSH TYPE (FWH)
- FIRE HYDRANT W/2 - 2 1/2" OUTLETS (FDPC) W/FIRE DEPT. PUMPER CONNECTION (HV) W/HOSE VALVES

- HYDRANT AND HYDRANT HOUSE
- KEY VALVE W/ROADWAY BOX
- WMA WATER MOTOR ALARM
- WFI WATER FLOW INDICATOR

FIRE PROTECTION ABBREVIATIONS

SPR	SPRINKLER PIPING
FP	FIRE PROTECTION
AS	AUTOMATIC SPRINKLER
WSP	WET STANDPIPE
DSP	DRY STANDPIPE - NO WATER CONNECTION
DSPW	DRY STANDPIPE - W/WATER CONNECTION

PIPING ABBREVIATIONS

CR	CONDENSATE RETURN
CWS	CONDENSER WATER SUPPLY
CWR	CONDENSER WATER RETURN
CHS	CHILLED WATER SUPPLY
CHR	CHILLED WATER RETURN
HPS	HIGH PRESSURE STEAM (50 PSIG & ABOVE)
LPS	LOW PRESSURE STEAM (BELOW 50 PSIG)
IA	INSTRUMENT AIR
CA	COMPRESSED AIR
D	DRIP
BD	BLOWDOWN
DOS	DIESEL OIL SUPPLY
DOR	DIESEL OIL RETURN
FOS	FUEL OIL SUPPLY
FOR	FUEL OIL RETURN
R	RELIEF LINE
FW	FEEDWATER
CF	CHEMICAL FEED
G	GAS (NATURAL)
BP	BACKFLOW PREVENTER
FP	FIRE PROTECTION
GWH	GAS WATER HEATER
IWH	INSTANTANEOUS WATER HEATER
FP	FIRE PROTECTION
DIW (OR) DI	DEIONIZED WATER
DMW	DEMINERALIZED WATER
SP	SUMP PUMP
RL	REFRIGERANT LIQUID
RS	REFRIGERANT SUCTION
RH	REFRIGERANT HOT GAS
DIS	DEIONIZED STEAM
HTWS	HIGH TEMP. WATER SUPPLY
HTWR	HIGH TEMP. WATER RETURN
AV	AMMONIA VACUUM
AS	AMMONIA SOLUTION
CV	CHLORINE VACUUM
CG	CHLORINE GAS
CL	CHLORINE LIQUID
CS	CHLORINE SOLUTION
RCP	REINFORCED CONCRETE PIPE
D.I.P.	DUCTILE IRON PIPE
N.O.	NORMALLY OPENED
NC	NORMALLY CLOSED
NPW	NON POTABLE WATER
DCCV	DOUBLE CONTAINED CHLORINE VENT
VC	VACUUM
HHWS	HOT WATER HEATING SUPPLY
HHWR	HOT WATER HEATING RETURN

HVAC ABBREVIATIONS

24x12	RECTANGULAR DUCT DIMENSION (1ST FIGURE IS SIDE SHOWN)
24x12 OV	OVAL DUCT DIMENSION (1ST FIGURE IS SIDE SHOWN)
12ø	ROUND DUCT DIMENSION
HVAC	HEATING, VENTILATION AND AIR CONDITIONING
FUR	FURNACE
EHC	ELECTRIC HEATING COIL
TOD	TOP OF DUCT
BOD	BOTTOM OF DUCT
AHU	AIR HANDLING UNIT
MAU	MAKE-UP AIR UNIT
CU	CONDENSING UNIT
ACC	AIR COOLED CONDENSING UNIT
EF	EXHAUST FAN
F	FAN
GUH	GAS UNIT HEATER
EUH	ELECTRIC UNIT HEATER
HWUH	HOT WATER UNIT HEATER
HWPH	HOT WATER PANEL HEATER
EC	ELECTRIC CONVECTOR
P	PUMP
OC	ODOR CONTROL
RA	RETURN AIR
EA	EXHAUST AIR
OA	OUTSIDE AIR
MA	MIXED AIR
VD(A)	VOLUME DAMPER (SPEC TYPE)
CD(A)	CONTROL DAMPER (SPEC TYPE)
FD(A)	FIRE DAMPER (SPEC TYPE)
BD(A)	BACKDRAFT DAMPER (SPEC TYPE)
MD	MANUAL DAMPER
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
AD	ACCESS DOOR
RG	RETURN AIR GRILLE
EG	EXHAUST GRILLE
ER	EXHAUST REGISTER
SR	SUPPLY REGISTER
RH	REHEAT
L	LOUVER
RV	RELIEF VENT
TA	TRANSFER AIR
VCP	VENTILATION CONTROL PANEL
CLDP	CHLORINE LEAK DETECTION CONTROL PANEL
SA	SUPPLY AIR
RH	RELATIVE HUMIDITY

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Professional Engineer's Seal — CERTIFICATE NO. 27129 STEVEN R. LIMING — Date Signed 11-01-01 — Arizona

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

Burns & McDonnell SINCE 1898

date DEC. 16, 1999	detailed R.L. BENNETT
designed R.L. BENNETT	checked R.G.H.

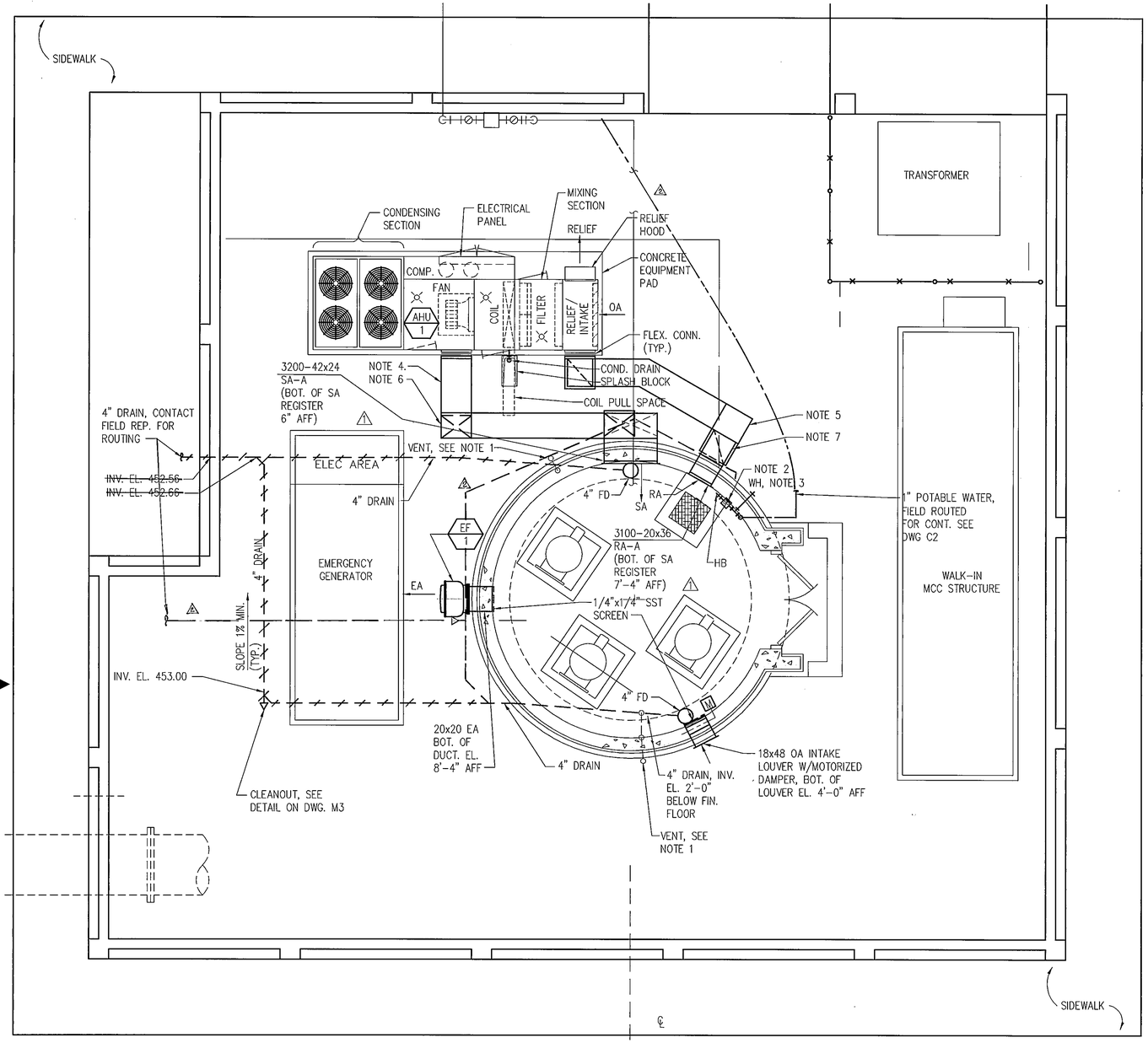
LAKE HAVASU CITY, ARIZONA INCORPORATED 1978

LONDON BRIDGE BEACH PUMP HOUSE

MECHANICAL LEGEND

project 97-777-1-002	contract W-183-00
drawing M1	rev. -
sheet 12 of 21 sheets	
file Lbbphml1.dwg 04-19-2000 08:19 RLB	

Scale For Microfilming: Millimeters / Inches



NOTES:

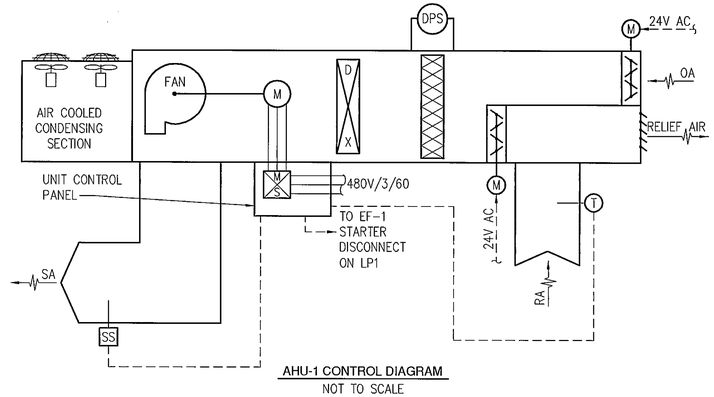
1. FLOOR DRAIN VENT TO PENETRATE PUMP HOUSE WALL AT 8'-6" ABOVE FINISHED FLOOR, TOP OF VENT ON OUTSIDE WALL SHALL BE 9'-6" ABOVE FINISHED FLOOR. (TYPICAL 2 PLACES)
2. 1" BACKFLOW PREVENTER, ? EL. 3'-6" ABOVE FINISHED FLOOR.
3. WALL HYDRANT (WH) AND HOSE BIBB (HB) ? EL. AT 3'-6" ABOVE FINISHED FLOOR.
4. 24x18 SA DUCT, BOTTOM OF DUCT EL. ±3'-9" ABOVE CONC. EQUIP. PAD.
5. 24x18 RA DUCT, BOTTOM OF DUCT EL. ±8" ABOVE CONC. EQUIP. PAD.
6. 24x18 90° ELBOW DOWN. TRANSITION FROM 24x18 TO 42x18.
7. 24x18 90° ELBOW UP. TRANSITION FROM 24x18 TO 20x20.

MECHANICAL FLOOR PLAN

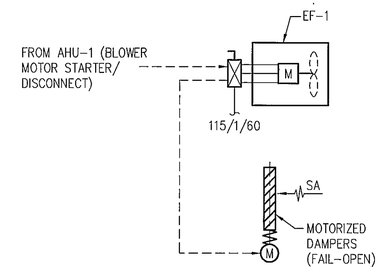
4 2 0 4 8

SCALE IN FEET

NORTH



AHU-1 CONTROL DIAGRAM
NOT TO SCALE



EF-1 CONTROL DIAGRAM
NOT TO SCALE

DESCRIPTION:

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

SEQUENCE OF OPERATION

COOLING:

1. GENERAL:

ALL SETPOINTS SHALL BE ADJUSTABLE. CONTROLS SHALL BE PROVIDED BY UNIT MOUNTED CONTROLLER.

2. 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

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

DIRTY FILTER

1. 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:

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

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1-800-782-5348
(OUTSIDE MARICOPA COUNTY)

Registered Professional Engineer (Civil)
CERTIFICATE NO.
27129
STEVEN R. LIMING
Date Signed 11-1-01
ARIZONA U.S.A.

no.	date	by	revision
1	7-25-01	JJM	(A1 -G8) REVISE DRAWING TO
			ACCOMODATE COLLECTOR WELL
			"AS BUILT" CONDITION
2	8-15-01	JDF	REVISED WATER & DRAIN LINES
	8-15-01	JDF	AS-BUILT

Burns & McDonnell SINCE 1898

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

LAKE HAVASU CITY, ARIZONA · INCORPORATED 1978

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

project	contract
97-777-1-002	W-183-00
drawing **M2**	rev. — #2
sheet 13 of 21 sheets	
file Lbbphm01.dwg 06-14-2000 13:34 LJM	

Scale For Microfilming
Millimeters
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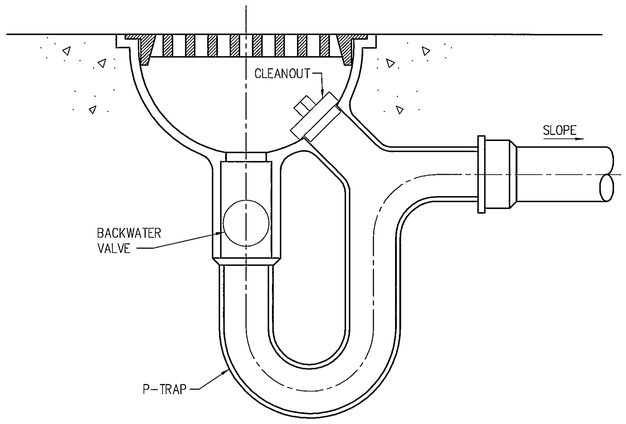
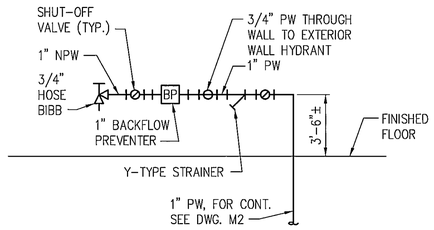
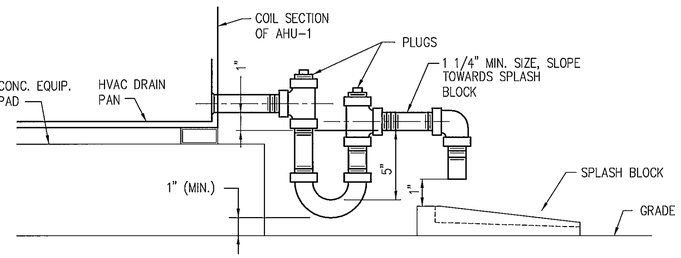


FLOOR DRAIN INSTALLATION DETAIL
NOT TO SCALE



INSIDE PUMP HOUSE BACKFLOW PREVENTER INSTALLATION DETAIL
NOT TO SCALE



HVAC CONDENSATE TRAP DRAIN DETAIL
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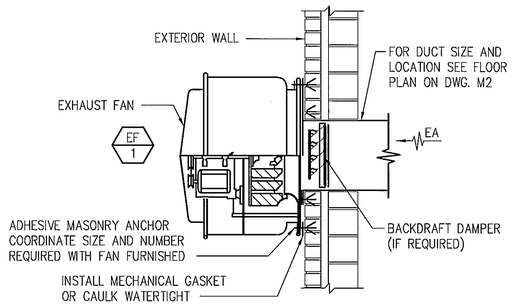
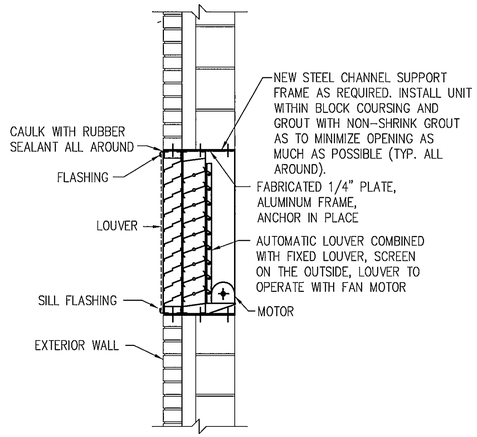
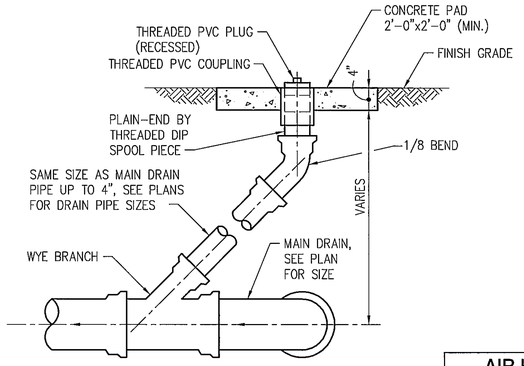


NOTE:
SEE PLANS FOR EXHAUST FAN LOCATIONS AND UNIT DESIGNATION. SEE SCHEDULES FOR PERFORMANCE DATA.

EXHAUST FAN INSTALLATION DETAIL
NOT TO SCALE



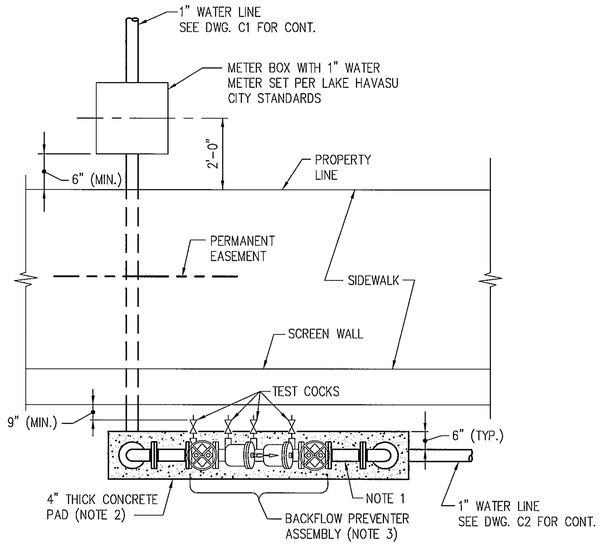
TYPICAL OUTSIDE AIR LOUVER WITH MOTORIZED DAMPER DETAIL
NOT TO SCALE



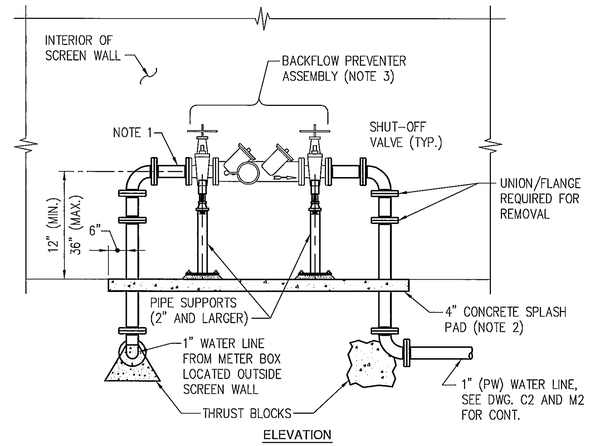
EXTERIOR CLEANOUT DETAIL
NOT TO SCALE

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



PLAN VIEW



ELEVATION

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

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

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Registered Professional Engineer (Civil) CERTIFICATE NO. 27129 STEVEN R. LIMING Date Signed 11-1-01 ARIZONA U.S.A.

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

Burns & McDonnell SINCE 1898

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

LAKE HAVASU CITY, ARIZONA INCORPORATED 1978

LONDON BRIDGE BEACH PUMP HOUSE
MISCELLANEOUS DETAILS AND SCHEDULES

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

Scale For Microfilming
Millimeters
Inches

PIPING

	GATE VALVE
	GLOBE VALVE
	BUTTERFLY VALVE
	CHECK VALVE
	STOP CHECK VALVE
	AUTOMATIC RECIRCULATION CHECK VALVE
	PLUG VALVE
	3-WAY PLUG VALVE (2-PORT)
	3-WAY PLUG VALVE (3-PORT)
	4-WAY PLUG VALVE (4-PORT)
	3-WAY VALVE
	ANGLE VALVE
	RELIEF OR SAFETY VALVE
	HOSE GATE DRAIN VALVE
	PINCH VALVE
	NEEDLE VALVE
	DIAPHRAGM VALVE
	BALL VALVE
P	SELF-CONTAINED PRESSURE REDUCING (REGULATING VALVE)
SR	SURGE RELIEF VALVE
	KNIFE GATE VALVE
	CORPORATION STOP
A	AIR RELEASE VALVE
AV	VACUUM VALVE
	AIR AND VACUUM VALVE
	BLOW-OFF VALVE ASSEMBLY
	LOCKED OPEN
	LOCKED CLOSED
	GAUGE SEAL

BP	BACKFLOW PREVENTER
VB	VACUUM BREAKER
MS	MOISTURE SEPARATOR
M	IN-LINE FLOW METER
	SIGHT FLOW INDICATOR
	FLEXIBLE HOSE
	EXPANSION ELEMENT (JOINT)
	FLEXIBLE BALL JOINT
	BASKET TYPE STRAINER
	TEE TYPE STRAINER
	Y-TYPE STRAINER
CS	CONICAL STRAINER
	DUPLEX STRAINER
	STEAM TRAP ASSEMBLY
	SLEEVE COUPLING (SC) HARNESSED SLEEVE COUPLING (HSC) INSULATED SLEEVE COUPLING (ISC)
	FLANGED COUPLING ADAPTER (FCA)
	DRAINER ASSEMBLY
	SAMPLE COOLER
	INSULATING FLANGE (I.F.)
	RESTRICTING ORIFICE
	STRAIGHTENING VANE
	RUPTURE DISK
	PIPE GUIDE
	PIPE WITH HEATING CABLE
	DRIP POCKET ASSEMBLY
	UNION
	PIPE ANCHOR
	REDUCER
	DISCHARGE ELBOW ASSEMBLY
	REMOVABLE PLUG
	REMOVABLE CAP
	WELDED CAP
BF	BLIND FLANGE
CO	CLEANOUT
YH	YARD HYDRANT
AC	AIR COCK
HB	HOSE BIBB
WH	WALL HYDRANT
	QUICK DISCONNECT COUPLING
	EXHAUST TO ATMOSPHERE (INSIDE)
	EXHAUST TO ATMOSPHERE (OUTSIDE)

VALVE OPERATORS

C	CYLINDER
D	DIAPHRAGM
M	MOTOR
S	SOLENOID
D	DIAPHRAGM WITH HANDWHEEL
	CHAINWHEEL
F	FLOAT

ABBREVIATIONS

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

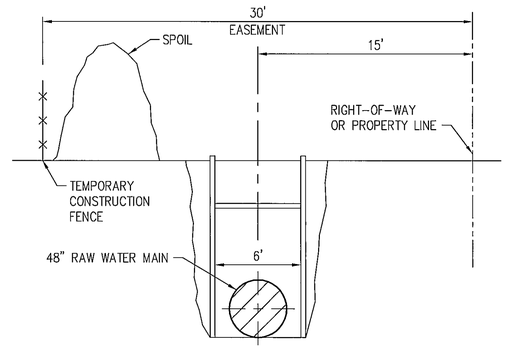
INSTRUMENTS

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

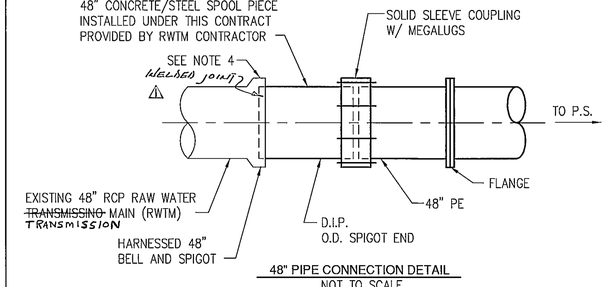
CATV	CABLE TELEVISION
G	GAS
OE	OVERHEAD ELECTRIC
UE	UNDERGROUND ELECTRIC
S	SANITARY SEWER
SS	STORM SEWER
T	TELEPHONE
UT	UNDERGROUND TELEPHONE
W	WATER
FM	FORCE MAIN
	FENCE
	PROPERTY LINE
	RIGHT OF WAY
	PERMANENT EASEMENT
	SECTION LINE
FO	FIBER OPTIC

NOTES:

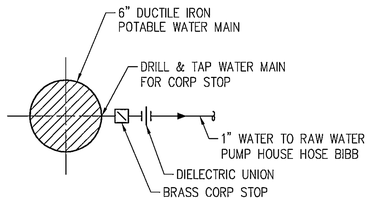
1. THIS IS A STANDARD PROCESS LEGEND AND NOT ALL ITEMS OR EQUIPMENT AS DESIGNATED HEREON ARE USED ON THIS PROJECT.



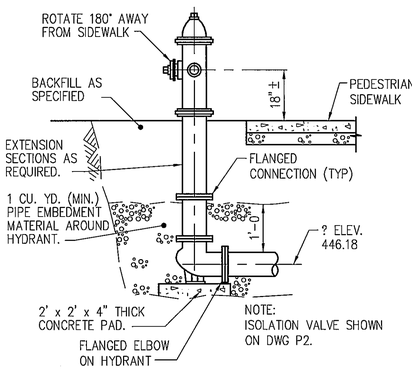
TYPICAL RAW WATER CONSTRUCTION ACCESS LIMITS
NOT TO SCALE



48" PIPE CONNECTION DETAIL
NOT TO SCALE



POTABLE WATER CONNECTION DETAIL
NOT TO SCALE



FIRE HYDRANT FH-1 DETAIL
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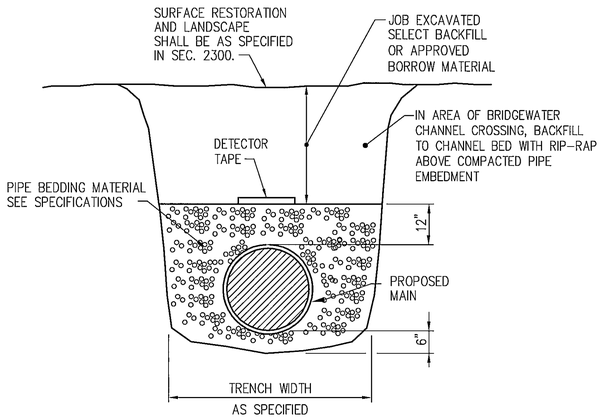

TYPICAL TRENCH DETAIL
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Registered Professional Engineer Corp
CERTIFICATE NO.
27129
STEVEN R.
LIMING
Date Signed 11-1-01
ARIZONA U.S.A.

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

Burns & McDonnell SINCE 1898

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

LAKE HAVASU CITY, ARIZONA
INCORPORATED 1978

LONDON BRIDGE BEACH PUMP HOUSE

PROCESS LEGEND

project 97-777-1-002	contract W-183-00
drawing P1	rev. –
sheet 9 of 21 sheets	
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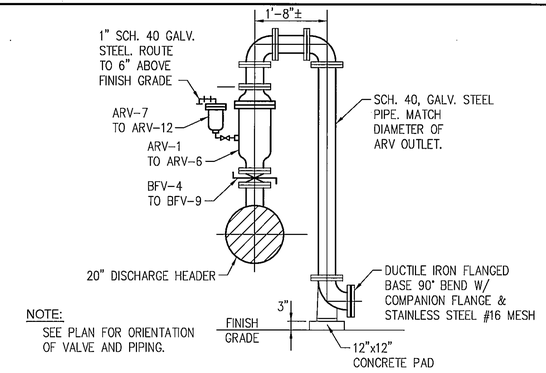
Scale For Microfilming: Millimeters / Inches



COMBINATION AIR/VACUUM RELIEF VALVE DETAIL
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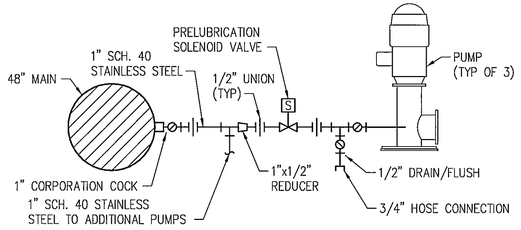

PRELUBRICATION SYSTEM DETAIL
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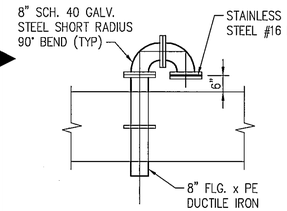

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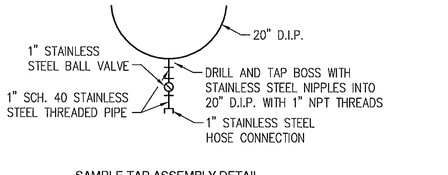

SAMPLE TAP ASSEMBLY DETAIL
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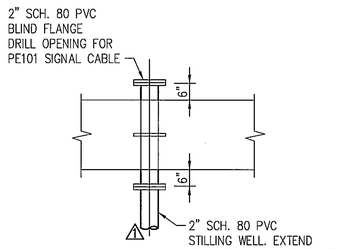

PRESSURE TRANSDUCER STILLING WELL DETAIL
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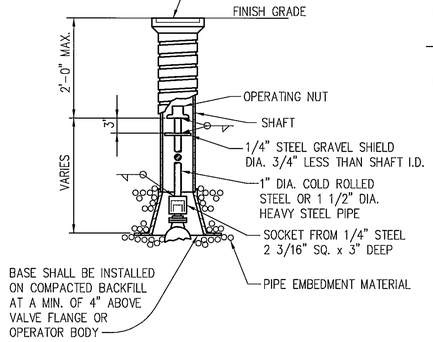
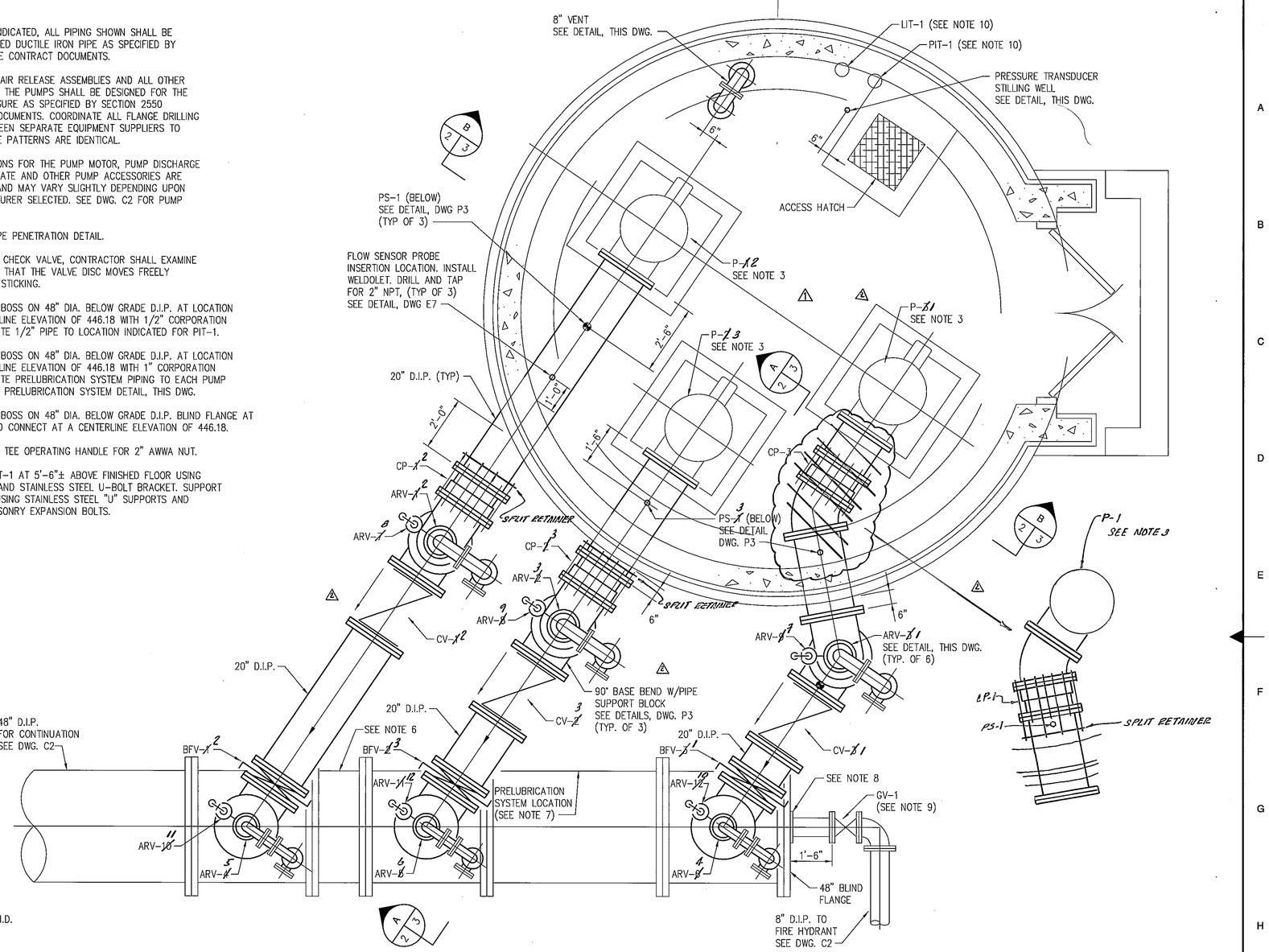


SCREW SHAFT TYPE VALVE BOX DETAIL
NOT TO SCALE

NOTES:

1. UNLESS OTHERWISE INDICATED, ALL PIPING SHOWN SHALL BE FLANGED MORTAR LINED DUCTILE IRON PIPE AS SPECIFIED BY SECTION 2550 OF THE CONTRACT DOCUMENTS.
2. 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.
3. 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.
4. SEE DWG. S4 FOR PIPE PENETRATION DETAIL.
5. PRIOR TO INSTALLING CHECK VALVE, CONTRACTOR SHALL EXAMINE THE DISC TO ENSURE THAT THE VALVE DISC MOVES FREELY WITHOUT BINDING OR STICKING.
6. 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.
7. 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.
8. 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.
9. PROVIDE OWNER WITH TEE OPERATING HANDLE FOR 2" AWWA NUT.
10. 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.



PARTIAL PLAN
2 0 2 4
SCALE IN FEET

NORTH

"AS-BUILT"

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

Registered Professional Engineer (Civil) CERTIFICATE NO. 27129 STEVEN R. LIMING Date Signed 11-1-01 ARIZONA U.S.A.

no.	date	by	revision
1	7-27-01	JJM	REVISE DRAWING TO ACCOMMODATE COLLECTOR WELL "AS BUILT"
2	8-15-01	JDF	DELETED ELEV, MODIFIED P-1, REVISED PUMP NUMBERS & ASSOCIATED EQUIPMENT.
	8-15-01	JDF	AS-BUILT

Burns & McDonnell SINCE 1898

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

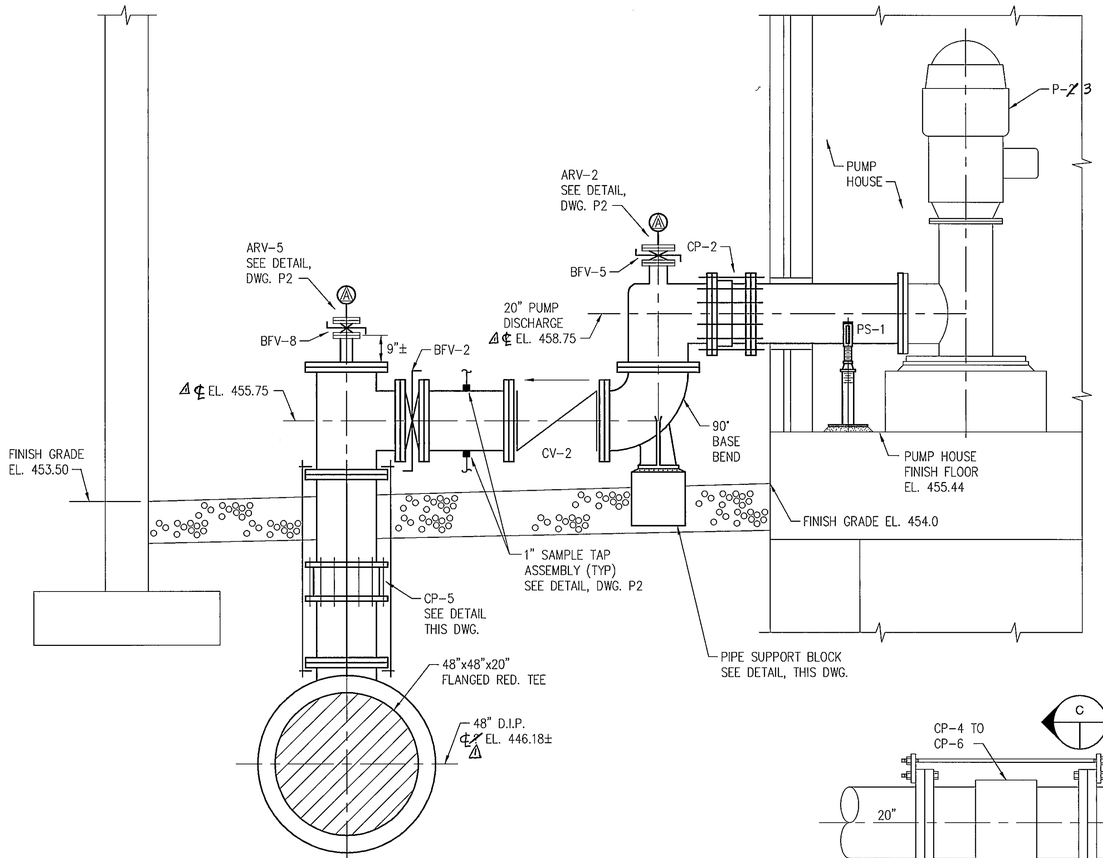
LAKE HAVASU CITY, ARIZONA INCORPORATED 1978

LONDON BRIDGE BEACH PUMP HOUSE

PARTIAL PLAN AND DETAILS

project 97-777-1-002 | contract W-183-00
drawing P2 – rev. 2
sheet 10 of 21 sheets
file Lbbphp02.dwg 03-20-2000 16:02 LJM

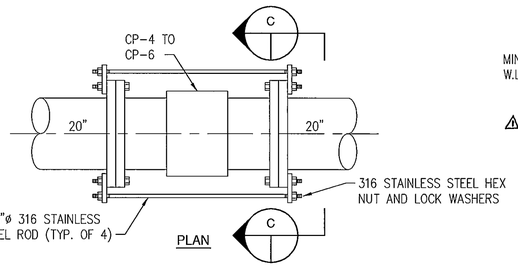
Scale For Microfilming: Millimeters / Inches



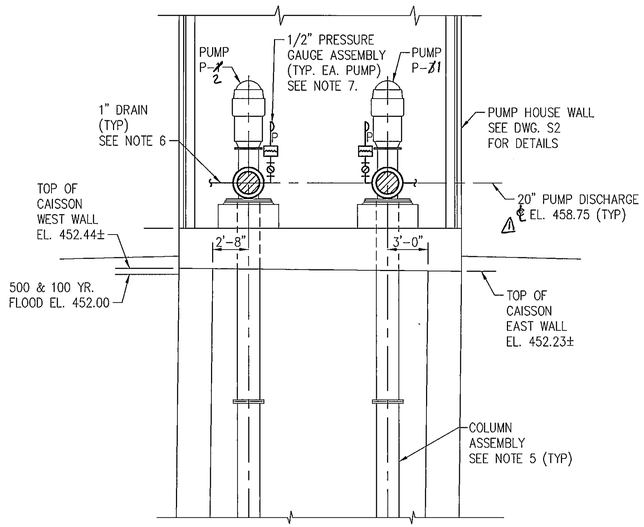
SECTION A

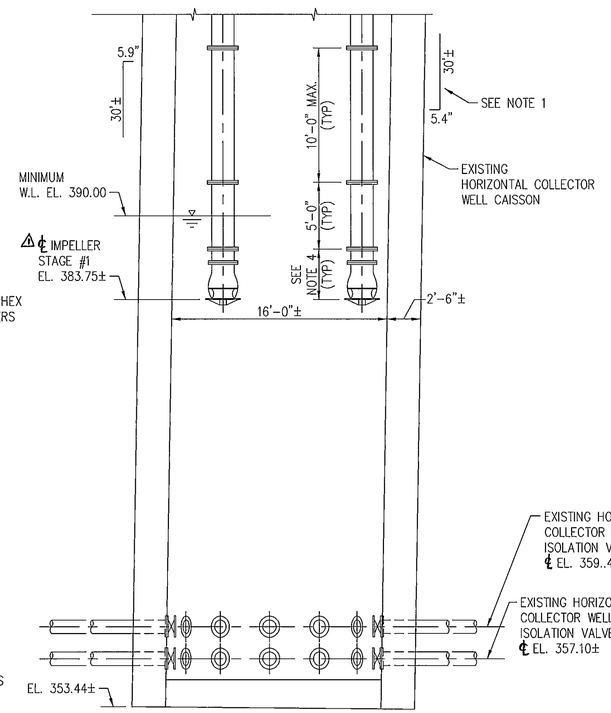
2 0 2 4

SCALE IN FEET



PLAN





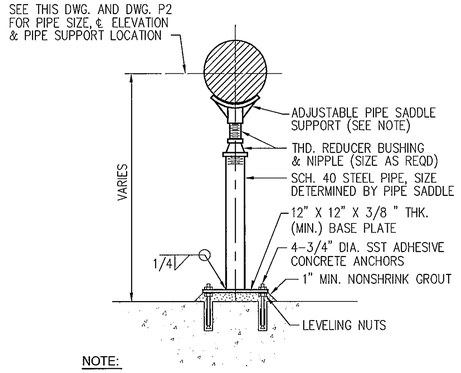
SECTION B

4 0 4 8 12

SCALE IN FEET

NOTES:

1. 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.
2. FOR THE SAKE OF CLARITY NOT ALL PIPING AND EQUIPMENT IS SHOWN.
3. 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.
4. DIMENSIONS OF BOWL ASSEMBLY AND QUANTITY OF STAGES VARY BETWEEN PUMP MANUFACTURERS.
5. 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.
6. 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.
7. PRESSURE GAUGE ASSEMBLIES SHALL CONSIST OF PRESSURE GAUGE, GAUGE SEAL, STAINLESS STEEL ISOLATION VALVE AND STAINLESS STEEL TUBING.



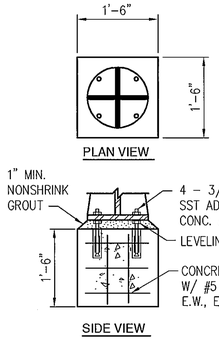
NOTE:

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

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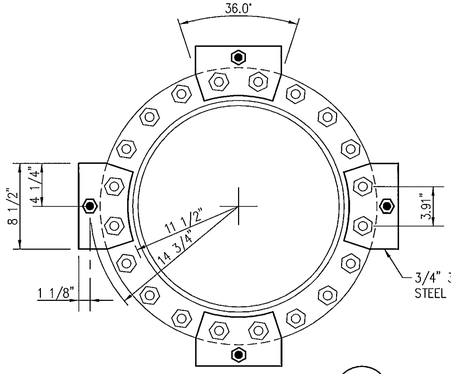

SECTION C

HARNESSED FLANGED COUPLING DETAIL

NOT TO SCALE

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Registered Professional Engineer (Civil) CERTIFICATE NO. 27129 STEVEN R. LIMING Date Signed 11-1-01

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

Burns & McDonnell SINCE 1898

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

LAKE HAVASU CITY, ARIZONA INCORPORATED 1978

LONDON BRIDGE BEACH PUMP HOUSE

SECTIONS AND DETAILS

project 97-777-1-002	contract W-183-00
drawing P3	rev. – 1
sheet 11 of 21 sheets	
file Lbbphp03.dwg 06-13-2000 15:06 LJM	

Scale For Microfilming: Millimeters / Inches

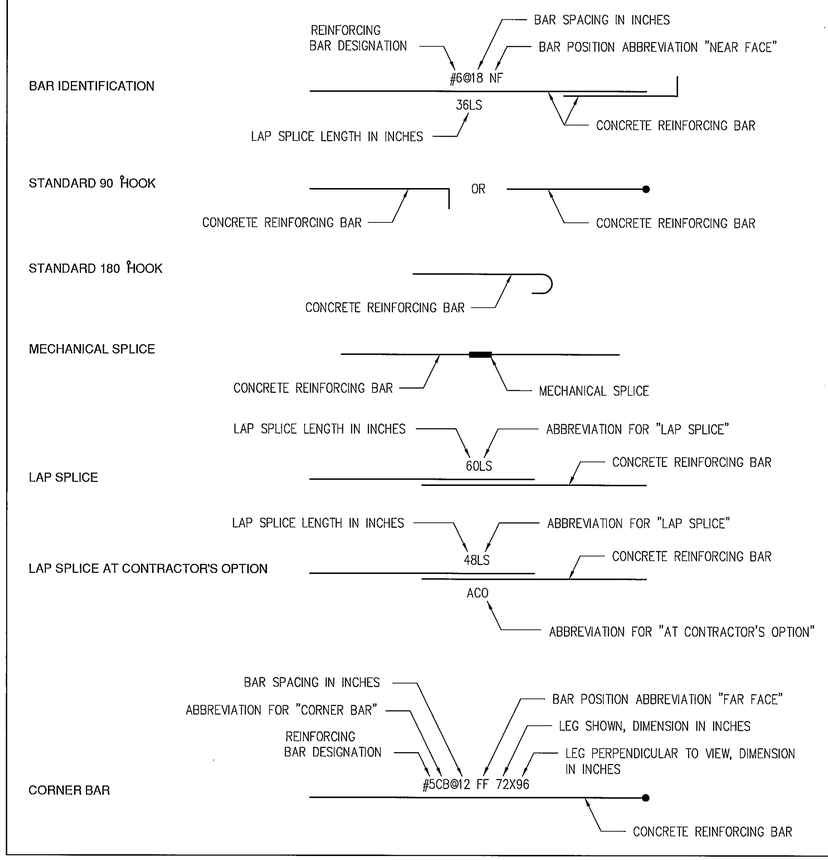
ABBREVIATIONS

AA	ALUMINUM ASSOCIATION
AASHTO	AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS
AB	ANCHOR BOLT
ABT	ABOUT
ACI	AMERICAN CONCRETE INSTITUTE
ACO	AT CONTRACTOR'S OPTION
ADH	ADHESIVE
AHR	ANCHOR
AHU	AIR HANDLING UNIT
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION
AISI	AMERICAN IRON AND STEEL INSTITUTE
AL, ALUM	ALUMINUM
ALTN	ALTERNATE
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
APPROX	APPROXIMATE
ARCH	ARCHITECTURAL
AWS	AMERICAN WELDING SOCIETY
BM	BEAM
BETW	BETWEEN
BO	BOTTOM OF
BOT	BOTTOM
BOS	BOTTOM OF STEEL
BRG	BEARING
CAP	CAPACITY
CB	CORNER BAR
CC	CLEAR COVER
CE	CONCRETE EDGE
CGF	COMPACTED GRANULAR FILL
CHKR	CHECKERED
CIRC	CIRCULAR
CIS	CENTERED IN SLAB
CIW	CENTERED IN WALL
CJ	CONSTRUCTION JOINT
CLJ	CONTROL JOINT
CLR	CLEAR
CM	CENTIMETER
CMU	CONCRETE MASONRY UNIT
CO	CONCRETE OPENING
COL	COLUMN
CONC	CONCRETE
CONN	CONNECTION
CONSTR	CONSTRUCTION
CONT	CONTINUOUS
COR	CORNER
CRSI	CONCRETE REINFORCING STEEL INSTITUTE
CTR	CENTER
CWB	CAPILLARY WATER BARRIER
CY	CUBIC YARD
db	BAR DIAMETER
DGA	DENSE GRADED AGGREGATE
D.I.	DUCTILE IRON
DIA	DIAMETER
DIAG	DIAGONAL
DIM	DIMENSION
DT	DOUBLE TEE
DWG	DRAWING
DWL	DOWEL
E	EAST
EA	EACH
ED	EQUIPMENT DRAIN
EF	EACH FACE
EJ	EXPANSION JOINT
EL	ELEVATION
ELEC	ELECTRICAL
EMBED	EMBEDMENT
EP	EQUIPMENT PAD
EQL	EQUAL
EQL SP	EQUALLY SPACED
EQPT	EQUIPMENT
EQUIV	EQUIVALENT
EW	EACH WAY
EXP	EXPANSION
EXST	EXISTING
EXT	EXTERIOR
f'c	ULTIMATE COMPRESSIVE STRENGTH OF CONCRETE
FD	FLOOR DRAIN
FDN	FOUNDATION
FF	FAR FACE
FL	FLOOR
FLG	FLANGE
f'm	ULTIMATE COMPRESSIVE STRENGTH OF MASONRY
FNSH	FINISH
FRP	FIBERGLASS REINFORCED PLASTIC
fs	PERMISSIBLE STEEL STRESS
FS	FAR SIDE
FT	FEET, FOOT
Fy, fy	YIELD STRESS
GA	GAGE, GAUGE
GAL	GALLON
GALV	GALVANIZED
GRTG	GRATING
GS	GRATING SUPPORT
H	HIGH
HEX	HEXAGON
HK	HOOK
HNDRL, HR	HANDRAIL
HORIZ	HORIZONTAL
HP	HORSEPOWER
HPT	HIGH POINT
HS	HIGH STRENGTH
HVAC	HEATING, VENTILATION, AND AIR CONDITIONING
IF	INNER FACE
INVT	INVERT
IJ	ISOLATION JOINT
JT	JOINT
K	KIP
kg	KILOGRAM
kN	KILONEWTON
KSF	KIPS PER SQUARE FOOT
KSI	KIPS PER SQUARE INCH
L	ANGLE, LADDER
LB	POUND
LG	LENGTH, LONG
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LLO	LONG LEG OUTSTANDING
LONG	LONGITUDINAL
LP	LOW POINT
LS	LAP SPLICE
M	METER
MATL	MATERIAL
MAX	MAXIMUM
MECH	MECHANICAL
MEZZ	MEZZANINE
MFR	MANUFACTURE(R)
MH	MANHOLE
MIN	MINIMUM
MJ	MECHANICAL JOINT
MM	MILLIMETER
MPa	MEGAPASCAL
N	NORTH
NE	NORTHEAST
NF	NEAR FACE
NO	NUMBER
NOM	NOMINAL
NS	NEAR SIDE
NTS	NOT TO SCALE
NW	NORTHWEST
OC	ON CENTER
OF	OUTER FACE
OPNG	OPENING
OPP	OPPOSITE
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
OZ	OUNCE
Pa	PASCAL
PCA	PORTLAND CEMENT ASSOCIATION
PCF	POUNDS PER CUBIC FOOT
PCI	PRESTRESSED CONCRETE INSTITUTE
PED	PEDESTAL
PJTN	PROJECTION
PL	PLATE, PROPERTY LINE
PLCS	PLACES
PLF	POUNDS PER LINEAR FOOT
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PRV	PRESSURE RELIEF VALVE
PT	POINT
PVC	POLYVINYL CHLORIDE
PWS	PLASTIC WATERSTOP
R	RISERS
RAD	RADIUS
RD	ROOF DRAIN
REF	REFERENCE
REINF	REINFORCEMENT
REQD	REQUIRED
RJ	ROUGHENED JOINT
S	SOUTH
SCHED	SCHEDULE
SD	SUBDRAIN
SE	SOUTHEAST, STEEL EDGE
SECT	SECTION
SHT	SHEET
SIM	SIMILAR
SJ	SAWED JOINT
SLO	SHORT LEG OUTSTANDING
SLV	SLEEVE
SP	SPACES
SPECS	SPECIFICATIONS
SQ	SQUARE
SST	STAINLESS STEEL
ST	SINGLE TEE
STD	STANDARD
STIFF	STIFFENER
STIR	STIRRUP
STL	STEEL
STRL	STRUCTURAL
STRUCT	STRUCTURE
SYMM	SYMMETRICAL
SW	SOUTHWEST
T	TON, TREAD, THICKNESS
TEMP	TEMPERATURE, TEMPORARY
THRU	THROUGH
T&B	TOP AND BOTTOM
T.O.	TOP OF
TOC	TOP OF CONCRETE
TOG	TOP OF GRATING
TOS	TOP OF STEEL
TSF	TONS PER SQUARE FOOT
TYP	TYPICAL
UBC	UNIFORM BUILDING CODE
UNO	UNLESS NOTED OTHERWISE
VERT	VERTICAL
W	WEST, WIDE
WD	WIDTH
WP	WORK POINT
WS	WATERSTOP
WT	WEIGHT, WATERTIGHT
WW	WASTEWATER
WWF	WELDED WIRE FABRIC
W/	WITH
W/O	WITHOUT
YD	YARD
&	AND
±	APPROXIMATELY
@	AT
x	BY
℄	CENTERLINE
°	DEGREE (PLANE ANGLE)
ø	DIAMETER
=	EQUAL
>	GREATER THAN
<	LESS THAN
#	NUMBER, POUND
%	PERCENT
	PLATE, PROPERTY LINE

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



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CERTIFICATE NO.
27129
STEVEN R. LIMING
Date Signed M-1-01

no.	date	by	revision
0	8-15-01	JDF	AS-BUILT

Burns & McDonnell SINCE 1898

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

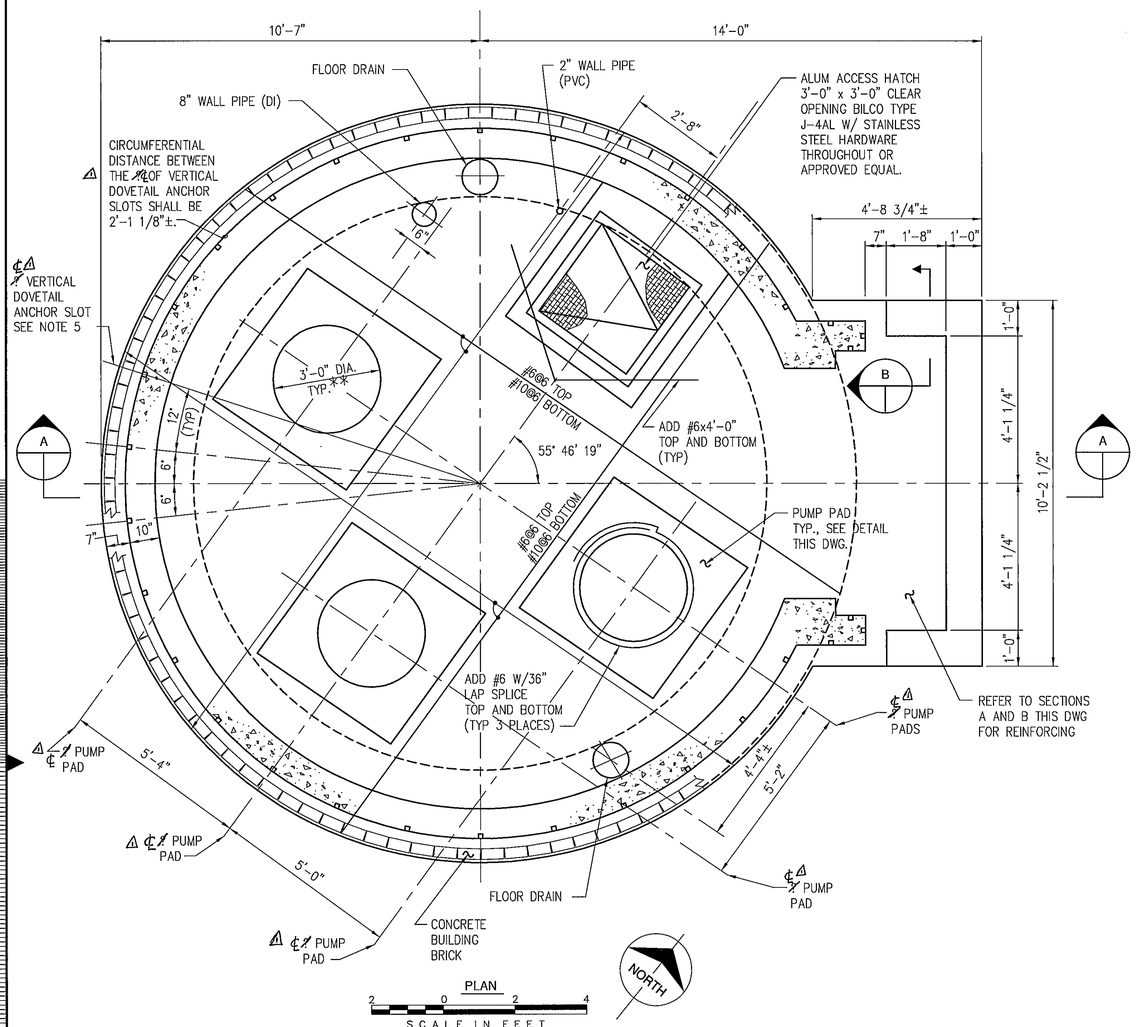
LAKE HAVASU CITY, ARIZONA INCORPORATED 1978

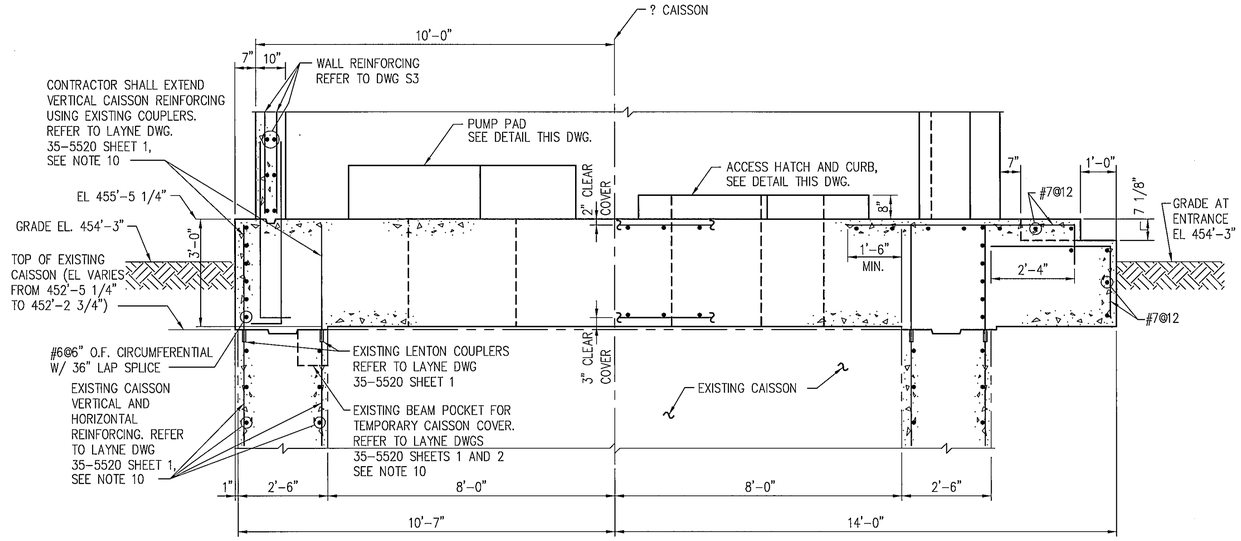
LONDON BRIDGE BEACH PUMP HOUSE

STRUCTURAL LEGEND

project 97-777-1-002 | contract W-183-00
drawing S1 | rev. –
sheet 5 of 21 sheets
file Lbbphs01.dwg 03-17-2000 12:36 JLR

Scale For Microfilming: Millimeters / Inches





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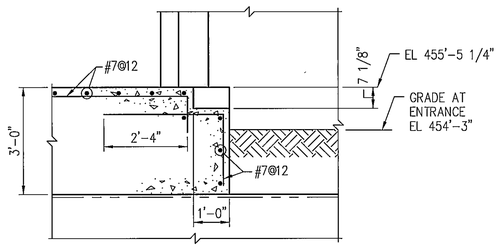

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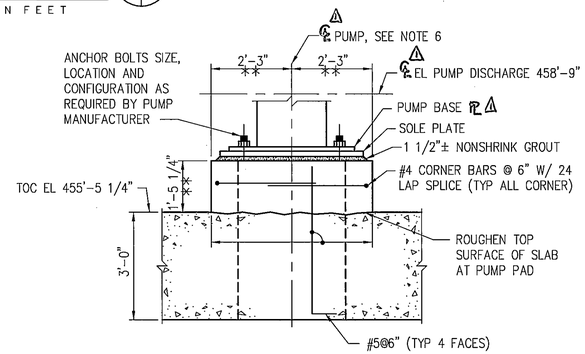

TYPICAL PUMP PAD DETAIL
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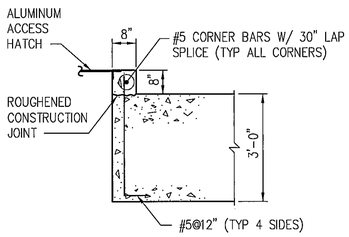

TYPICAL ACCESS HATCH CURB DETAIL
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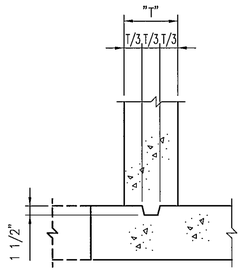
SCALE IN FEET



CJ-2
NOT TO SCALE

GENERAL NOTES FOR PUMP HOUSE :

1. CONCRETE COMPRESSIVE STRENGTH, f'c = 4000 psi.
2. CONCRETE REINFORCEMENT, ASTM A615 GRADE 60.
3. STRUCTURAL STEEL:
   a. STRUCTURAL TUBING, ASTM A500, GRADE C.
   b. STRUCTURAL STEEL ASTM A36.
4. MASONRY:
   a. COMPRESSIVE STRENGTH, f'm = 1500 psi.
   b. CONCRETE BUILDING BRICK TO BE TINTED SPLIT-FACE IN "TAN" COLOR.
   c. PROVIDE EXPANSION JOINTS IN CONCRETE BUILDING BRICK AT 16'-0". CENTERS MAXIMUM SPACING.
   d. ALL MASONRY SHALL BE SPECIALLY INSPECTED PER 1997 UBC.
5. DOVETAIL ANCHOR SLOT AND ANCHORS:
   a. 24 GAGE, ZINC ALLOY, 1" WIDE x 1" DEEP x 5/8" THROAT
   b. DOVETAIL ANCHORS SHALL BE LOCATED AT VERTICAL SPACING PER SPECIFICATIONS.
   C. BOTTOM OF DOVETAIL ANCHOR SLOT SHALL BE 1'-2" ABOVE FINISH FLOOR.
6. ** INDICATES DIMENSIONS OR ELEVATIONS TO BE VERIFIED BY CONTRACTOR. IF DIMENSION OR ELEVATION DIFFERS, CONTRACTOR SHALL NOTIFY ENGINEER IN WRITING.
7. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING AND PROVIDING ALL OPENINGS AS REQUIRED FOR MECHANICAL, ELECTRICAL AND PROCESS EQUIPMENT.
8. REINFORCE ALL WALL PENETRATIONS PER DETAILS CO-1 AND CO-2 AS WELL AS PROVIDE CLOSURES AT OPENINGS. REFER TO DRAWING S4.
9. CONTRACTOR SHALL REMOVE AND DISPOSE OF TEMPORARY CAISSON COVER, REFER TO LAYNE DRAWINGS 35-5520 SHEETS 1 AND 2. SEE NOTE 10.
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.

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(OUTSIDE MARICOPA COUNTY)

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27129
STEVEN R. LIMING
Date Signed 11-1-01

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

Burns & McDonnell SINCE 1898

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

LAKE HAVASU CITY, ARIZONA INCORPORATED 1978

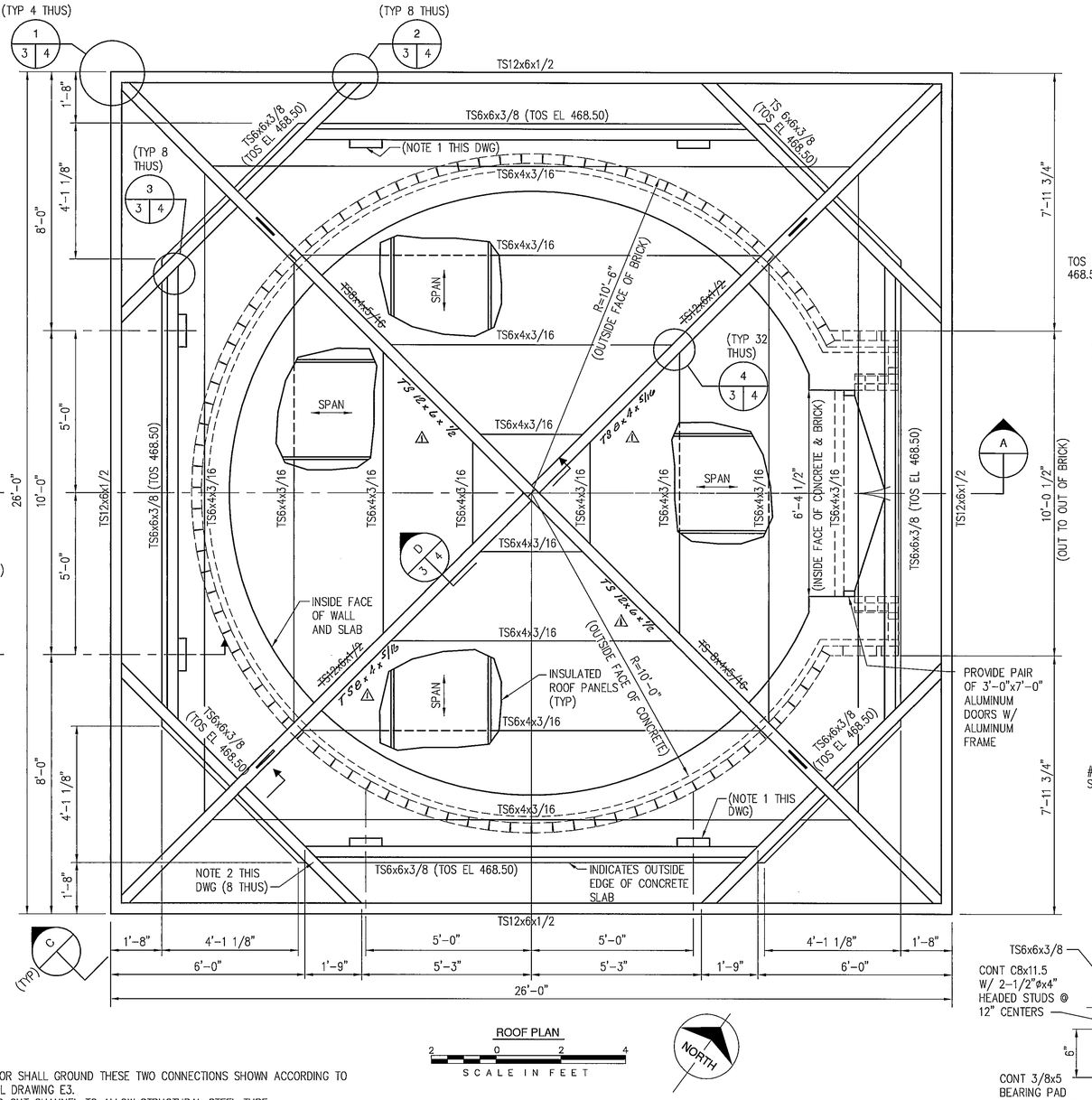
LONDON BRIDGE BEACH PUMP HOUSE

FOUNDATION PLAN AND DETAILS

project 97-777-1-002 | contract W-183-00
drawing S2 | rev. 1
sheet 6 of 21 sheets
file

J:\LKHAVASU\977771.002\Drawings\Struc\Lbbphs02.dwg 06-13-2000 15:21 LJM

Scale For Microfilming
Millimeters
Inches

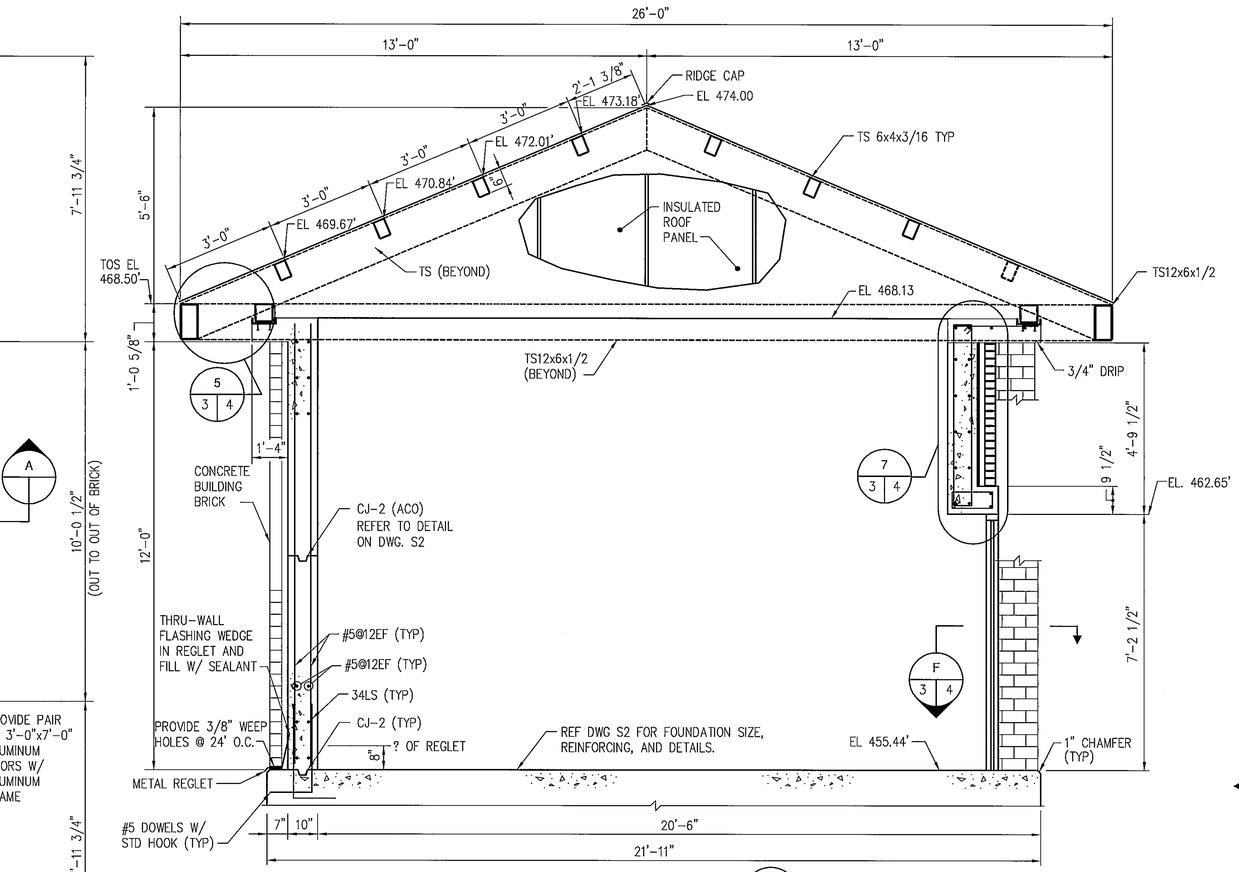


ROOF PLAN

SCALE IN FEET

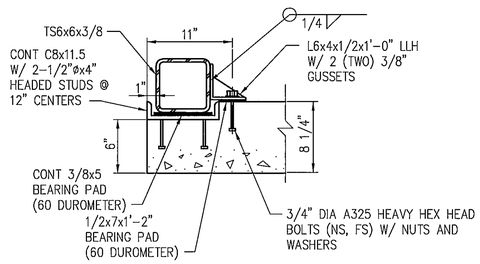
NOTES:

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.



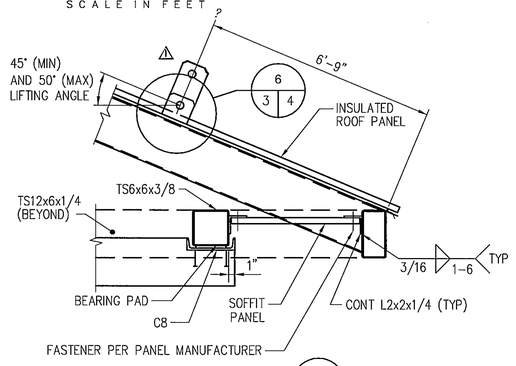
SECTION A

SCALE IN FEET



SECTION B

SCALE IN FEET



SECTION C

SCALE IN FEET

"AS-BUILT"

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

Registered Professional Engineer (Civil) Certificate No. 27129 STEVEN R. LIMING Date Signed JUL 01

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

Burns & McDonnell SINCE 1898

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

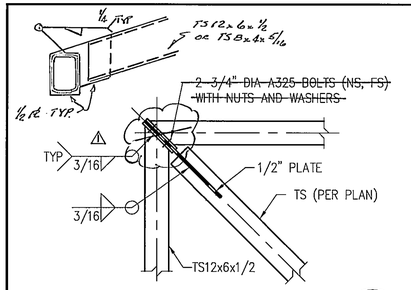
LAKE HAVASU CITY, ARIZONA INCORPORATED 1978

LONDON BRIDGE BEACH PUMP HOUSE

ROOF PLAN AND DETAILS

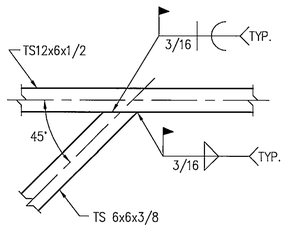
project 97-777-1-002	contract W-183-00
drawing **S3**	rev. –
sheet 7 of 21 sheets	
file Lbbphs03.dwg 03-23-2000 14:00 JLR	

Scale For Microfilming: Millimeters / Inches



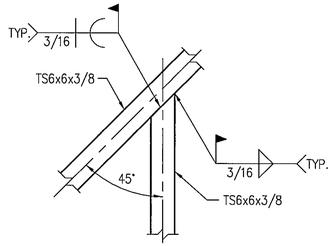
DETAIL 1

SCALE IN FEET



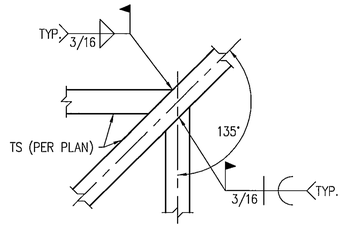
DETAIL 2

SCALE IN FEET



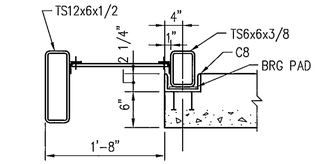
DETAIL 3

SCALE IN FEET



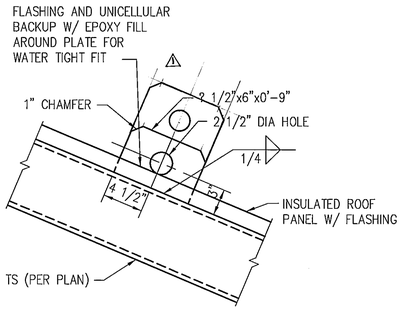
DETAIL 4

SCALE IN FEET



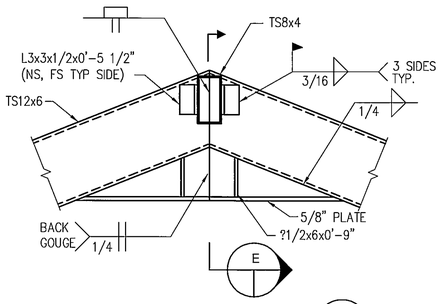
DETAIL 5

SCALE IN FEET



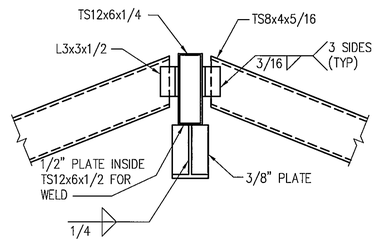
DETAIL 6

SCALE IN FEET



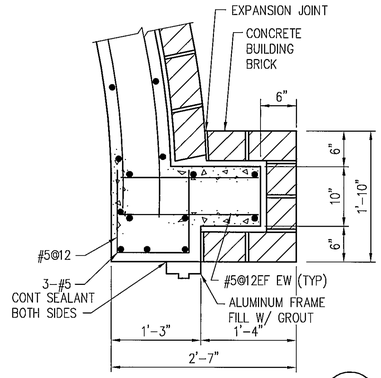
SECTION D

SCALE IN FEET



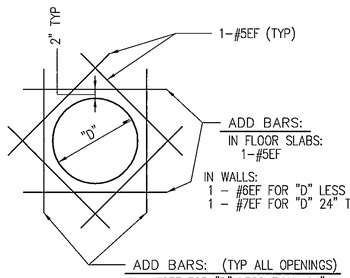
SECTION E

SCALE IN FEET



SECTION F

SCALE IN FEET

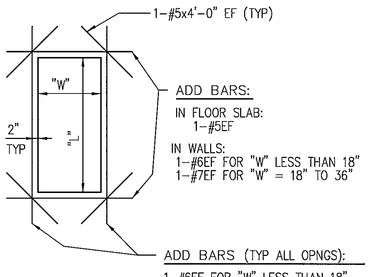


NOTES:

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.

UNSLEEVED OPENING

CO-1

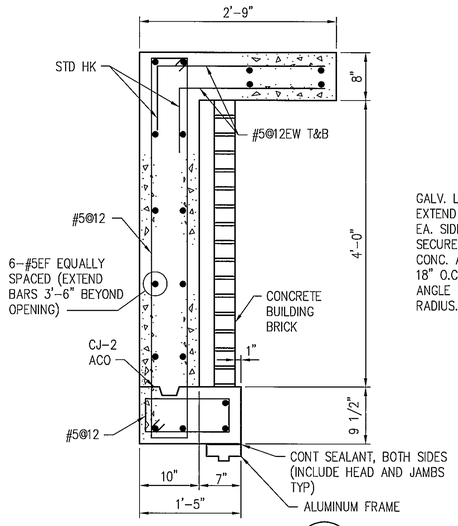


NOTES:

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.

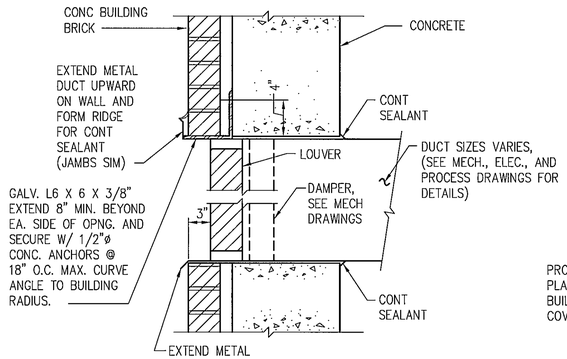
UNSLEEVED OPENING

CO-2



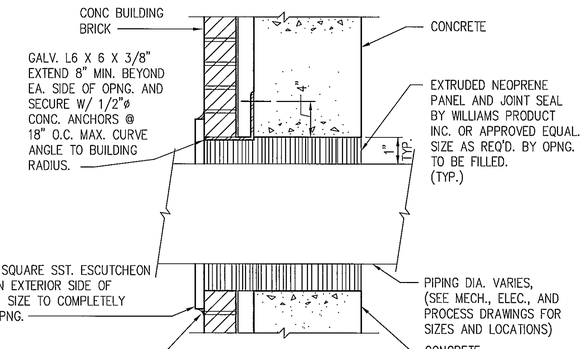
SECTION 7

SCALE IN FEET



TYPICAL EXHAUST LOUVER DETAIL

NOT TO SCALE



TYPICAL PIPE THRU EXTERIOR WALL

NOT TO SCALE

"AS-BUILT

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

Registered Professional Engineer Civil
CERTIFICATE NO.
27129
STEVEN R. LIMING
Date Signed 11-1-01

no.	date	by	revision
1	8-15-01	JDF	REVISED CORNER DETAIL & LIFTING EYE DETAIL.
	8-15-01	JDF	AS-BUILT

Burns & McDonnell SINCE 1898

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

LAKE HAVASU CITY, ARIZONA INCORPORATED 1978

LONDON BRIDGE BEACH PUMP HOUSE

DETAILS AND SECTIONS

project 97-777-1-002	contract W-183-00
drawing S4	rev. –
sheet 8 of 21 sheets	
file Lbbphs04.dwg 03-23-2000 15:25 JLR	

Millimeters Inches Scale For Microfilming