MAYOR
KATE GALLEGO

CITY COUNCIL

DISTRICT 1 ANN O'BRIEN
DISTRICT 2 JIM WARING
DISTRICT 3 DEBRA STARK
DISTRICT 4 LAURA PASTOR
DISTRICT 5 BETTY GUARDADO
DISTRICT 6 SAL DICICCIO
DISTRICT 7 YASSAMIN ANSARI
DISTRICT 8 CARLOS GARCIA

CITY MANAGER
JEFFREY BARTON

CITY ENGINEER
ERIC J. FROBERG, PE

WATER SERVICES DIRECTOR
TROY HAYES, PE

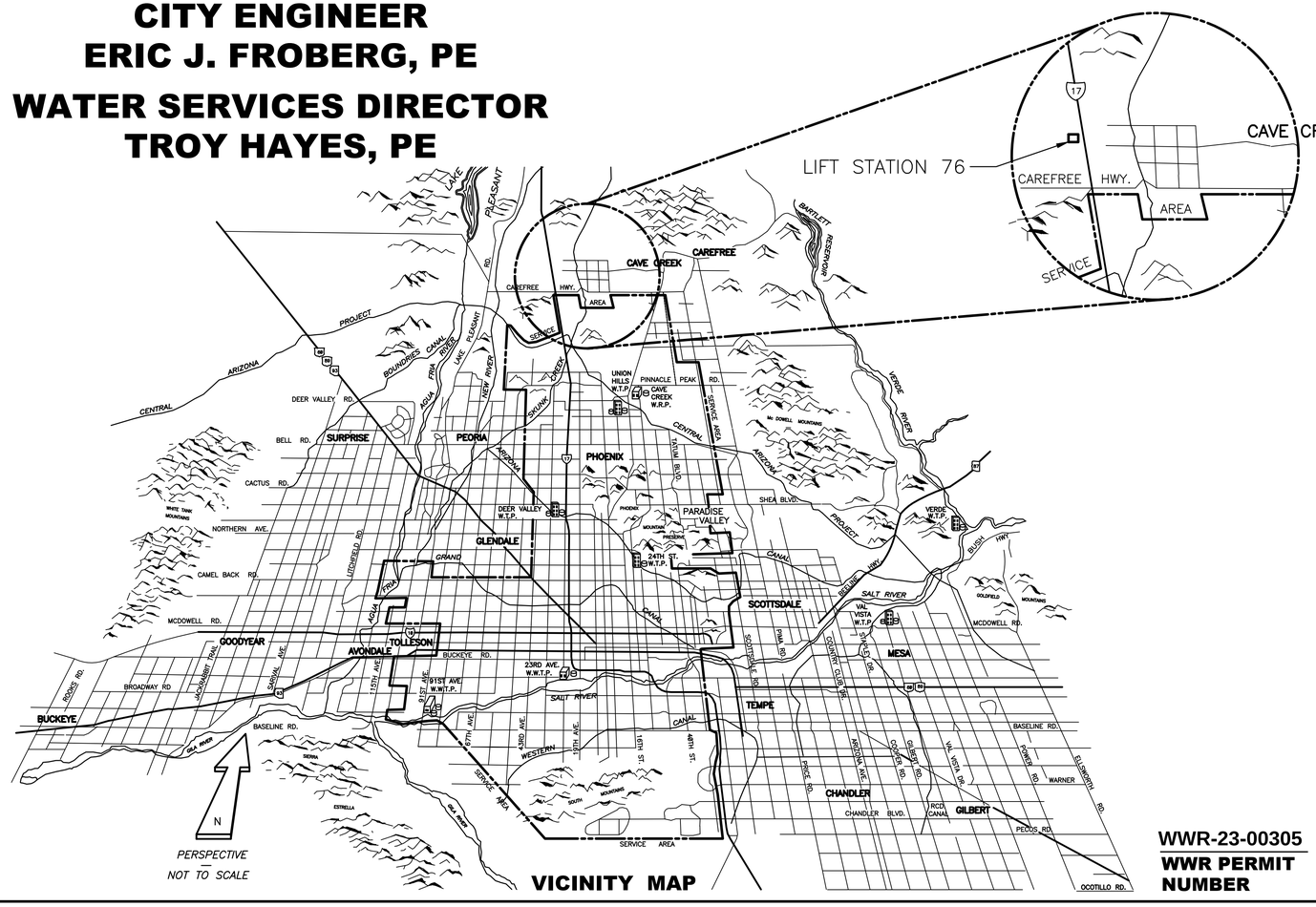
City of Phoenix

WATER SERVICES DEPARTMENT

LIFT STATION 76 PHASE II EXPANSION
PROJECT NO. WS90400067
38107 NORTH PIONEER ROAD

100% SUBMITTAL

MAY 2023
VOLUME 3 OF 3
SHEETS 1 TO 40



VICINITY MAP

WWR-23-00305
WWR PERMIT NUMBER

OWNER CONTACT INFORMATION
CITY OF PHOENIX
200 WEST WASHINGTON STREET
602-262-4053

ENGINEER CONTACT INFORMATION
FERNANDO SARMIENTO
GREELEY AND HANSEN
2800 N. 44TH STREET, SUITE #650
PHOENIX, ARIZONA 85008
602-778-8475
FSARMIENTO@GREELEY-HANSEN.COM

LOCATION FOR AS-BUILT INDEXING

TOWNSHIP	RANGE	SECTION	1/4 SECTION
6N	2E	27	SW

APPROVALS

WATER SERVICES DEPARTMENT — DATE 04/17/2023

MARICOPA COUNTY ENVIRONMENTAL SERVICES DEPARTMENT — DATE 02/14/2024

Registered Professional Engineer, Civil
CERTIFICATE NO.
41013
FERNANDO SARMIENTO
Date Signed
ARIZONA, U.S.A.

THIS DRAWING MUST BE FIELD VERIFIED BEFORE USE
DRAWING NOT TO SCALE UNLESS SCALE BAR IS PRESENT

SUBMITTAL

100%

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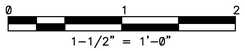
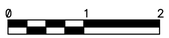
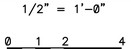
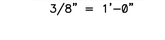
BAR SCALES

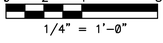
ARCHITECTURAL UNITS

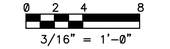


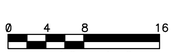


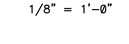




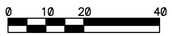


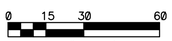


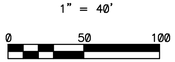


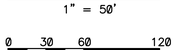


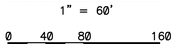
DECIMAL UNITS



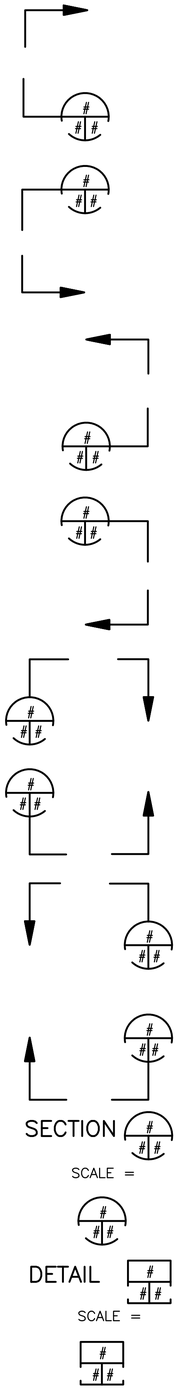








MARKERS



ARROWS

KEY NOTES

DEMOLITION

PIPE TAG

DESIGN	EXISTING	FUTURE
12" RW	P 1001	P 1001

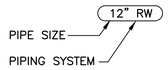
* PIPING SYSTEM DESIGNATIONS FOR EXISTING PIPE INDICATE TYPE OF SERVICE ONLY AND DO NOT IMPLY PIPE MATERIALS USED.

PULL-DOWN MENU COMMAND: CADDCOP> XX> LEADERS> RACETRACK>

OR

COMMAND: TCIRCLE, SELECT TEXT, MTEXT, OR ATTDEF OBJECT: SELECT,
DISTANCE OFFSET FACTOR, 0.05,
ENCLOSE TEXT WITH: (SELECT SLOTS OR RECTANGLES),
CREATE SLOTS OR RECTANGLES WITH: (SELECT VARIABLE FOR TYPE)

PIPING IS CALLED OUT BY SIZE FOLLOWED BY
PIPING SYSTEM, ENCLOSED AS SHOWN:

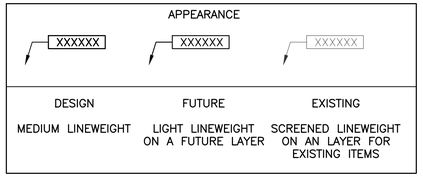


EQUIPMENT TAG

X X X X X X X

7-DIGIT SERIALIZED KEY

ASSIGNED TO
PROJECT BY CITY'S
PROJECT MANAGER



ITEMS TO HAVE EQUIPMENT TAGS:
ALL MANUAL VALVES FOUR (4) INCHES AND LARGER, ALL VALVES ELECTRICAL OPERATED.
ALL INSTRUMENTS, MOTORS, AND EQUIPMENT

WHERE THE SAME ITEM IS SHOWN IN SEVERAL DISCIPLES, THEY SHALL REPEAT IN APPEARANCE IN ALL ELECTRICAL, INSTRUMENTAION, PROCESS MECHANICAL DRAWINGS.

SHEET IDENTIFICATION

A ARCHITECTURAL (ARCHITECTURAL EXTERIORS, INTERIORS, RENDERINGS)
C CIVIL SITE (PAVING AND GRADING, YARD PIPING,)
E ELECTRICAL (POWER DISTRIBUTION AND ELECTRICAL EQUIPMENT WITHIN STRUCTURES OR ON SITE)
F FIRE PROTECTION
G GENERAL (COVER, INDEX, GENERAL ABBREVIATIONS, HYDRAULIC PROCESS)
H HVAC (HEATING, VENTILATION AND AIR CONDITIONING)
I INSTRUMENTATION (P&ID'S, CONTROL PANELS)
L LANDSCAPE (VEGETATION AND HARDSCAPE, IRRIGATION SUPPLY)
M MECHANICAL (PROCESS PIPING & EQUIPMENT)
P PLUMBING (EQUIPMENT DRAINS, ROOF DRAINS, SEWERS, VENTS)
Q EQUIPMENT PURCHASED BY THE OWNER
S STRUCTURAL (STRUCTURE WALLS, SLABS, REINFORCED BUILDING OR CONCRETE ELEMENTS)
T TELECOMMUNICATIONS (ELECTRONIC COMMUNICATIONS EQUIMENT, CONDUIT)
X OTHER DISCIPLINES
Z CONTRACTOR/SHOP DRAWINGS

DWG INDEX

DWG NO.	DWG NAME	DESCRIPTION
GENERAL		
1	G00	COVER SHEET
2	G01	LEGEND AND DRAWING INDEX
3	G02	ABBREVIATIONS
4	G03	GENERAL NOTES
CIVIL		
5	C01	LEGEND
6	C02	NOTES AND HYDRAULIC PROFILE
7	C03	EXISTING SITE PLAN WITH GEOMETRIC CONTROL
8	C04	DEMOLITION PLAN
9	C05	NEW YARD PIPING PLAN
10	C06	DETAILS 1
11	C07	DETAILS 2
MECHANICAL		
12	M01	LEGEND 1
13	M02	LEGEND 2
14	M03	EXISTING LIFT STATION DEMOLITION PLAN & SECTION
15	M04	NEW LIFT STATION PLAN
16	M05	NEW LIFT STATION PLAN & SECTION
17	M06	BIOFILTER PLAN AND SECTION
18	M07	BIOFILTER IRRIGATION PLAN
19	M08	DETAILS 1
20	M09	MECHANICAL SCHEDULES
STRUCTURAL		
21	S01	GENERAL STRUCTURAL NOTES
22	S02	PLAN AND SECTION
23	S03	TYPICAL DETAILS
ELECTRICAL		
24	E01	LEGEND 1
25	E02	LEGEND 2
26	E03	ABBREVIATIONS AND AREA CLASSIFICATION
27	E04	ELECTRICAL SITE PLAN DEMOLITION
28	E05	ELECTRICAL SITE PLAN
29	E06	ELECTRICAL SINGLE LINE DEMOLITION
30	E07	ELECTRICAL SINGLE LINE AND EQUIPMENT ELEVATION
31	E08	SCHEMATIC DIAGRAM
32	E09	PANEL AND LOAD SCHEDULES
33	E10	CONDUIT BLOCK DIAGRAM
INSTRUMENTATION AND CONTROL		
34	I01	LEGEND 1
35	I02	LEGEND 2
36	I03	ABBREVIATIONS
37	I04	NEW WET WELL P&ID
38	I05	NEW WET WELL AUTODIALER P&ID
39	I06	BIOFILTER P&ID
40	I07	DETAILS
OTHER		
41	X01	BYPASS PUMPING PLAN

FACILITY DRAWINGS
This drawing was supplied by a Consultant Engineer from a past construction project. The original construction drawing was modified based on information provided by the Contractor to provide a Record Drawing. The City does not warranty this drawing to be a complete and accurate portrayal of facilities as they exist in the field.

REVISION	ENGINEERING COMPANY	PROJECT NO.	PROJECT NAME	DATE	CAD FILE NAME	DWG NUMBER	REMARKS

FOR CITY OF PHOENIX USE ONLY - REFERENCE CID NUMBER: #

Contact Arizona 811 at least two full working days before you begin excavation
ARIZONA811 BLUE STAKE, INC.
Call 811 or click Arizona811.com

Registered Professional Engineer (Civil) CERTIFICATE NO. 41013 FERNANDO SARMIENTO Date Signed 6/30/23 ARIZONA, U.S.A.

GREELEY AND HANSEN
2800 N. 44TH STREET, SUITE 650
PHOENIX, AZ 85008

REVISIONS				
NO.	BY	DATE	CKD	REMARKS

DES MT/RP
DWN RAM
CKD FS

City of Phoenix

CITY OF PHOENIX
WATER SERVICES DEPARTMENT
COLLECTION SYSTEMS
REMOTE FACILITIES

GENERAL

LIFT STATION 76 PHASE II EXPANSION
LEGEND AND DRAWING INDEX

CITY PROJECT NO. WS90400067

DATE: MAY 2023

G01 SHEET 2 OF 40

CAD FILE: 04276.05_G01

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STANDARD ABBREVIATIONS

SYMBOLS

@	AT
%	PERCENT

A

A	ARCHITECTURAL
AB	ANCHOR BOLT
ABC	AGGREGATE BASE COURSE ASPHALTIC
AC	CONCRETE
AD	ACCESS DOOR
ADM	ADMINISTRATION
AFF	ABOVE FINISHED FLOOR
AG	AUTOMATIC GATE
AHU-#	AIR HANDLING UNIT NO. #
ALT	ALTERNATE
ALUM	ALUMINUM
AMB	AMBIENT
ANPP	ARIZONA NUCLEAR POWER PLANT
APPROX	APPROXIMATELY
ASE	ATM SWITCH ENCLOSURE
ASP	ASPHALT PAVEMENT
ATC	AUTOMATIC TEMPERATURE CONTROL
ATM	ASYNCHRONOUS TRANSFER MODE

B

BC	BRASS CAP
BDD	BACKDRAFT DAMPER
BDG	BRIDGE
BDS	BUSINESS DATA SERVER
BE	BEAM
BHP	BRAKE HORSEPOWER
BLD	BLIND
BLDG	BUILDING
BM	BENCHMARK
BOD	BOTTOM OF DUCT
BOR	BOTTOM OF REGISTER
BOT	BOTTOM
BOW/BW	BOTTOM OF WALL BYPASS
BP	BUSHING
BUSH	BEGIN VERTICAL CURVE
BVC	

C

C	CIVIL
CC	CENTER TO CENTER
CCS	COMPUTER CONTROL SYSTEM
CD#	CEILING AIR DIFFUSER (#=TYPE A, B...)
CFH	CUBIC FEET OF STANDARD AIR PER HOUR
CFM	CUBIC FEET OF STANDARD AIR PER MINUTE
CG	CONTROL GATE
CHR	CHLORINATOR
CJ	CONSTRUCTION JOINT
CLR	CLEAR OR CLEARANCE
CMMS	COMPUTER MAINTENANCE MANAGEMENT SYSTEM
CMP	COMPUTER
CMU	CEMENT MASONRY UNIT
CODP	CLEAN OUT DECK PLATE
CONC	CONCRETE
CONN	CONNECTION
CONT	CONTINUOUS OR CONTINUATION
COP	CITY OF PHOENIX
CPLG	COUPLING

D

DB	DRY BULB
DBL	DOUBLE
DCS	DISTRIBUTED CONTROL SYSTEM
DCU	DISTRIBUTED CONTROL UNIT
DMWS	DATA MANAGEMENT WORK STATION
DEGC	DEGREES CENTIGRADE
DEGF	DEGREES FAHRENHEIT
DEGREE	ANGULAR DEGREES
DG	DECOMPOSED GRANITE
DIA	DIAMETER
DMH	DRAINAGE MANHOLE
DT	DAY TANK
DTL	DETAIL
DWG	DRAWING
DWG	DRAWING WEB FORMAT
DWL	DOWEL

E

E	ELECTRICAL
EA	EACH
ECC	ECCENTRIC
ECV	EVAPORATIVE COOLING UNIT
EDB	ELECTRICAL DUCT BANK
EF-#	EXHAUST FAN NO. #
EF	EACH FACE
EJ	EXPANSION JOINT
EL/ELEV	ELEVATION
EMER	EMERGENCY
EMH	ELECTRICAL MANHOLE
EOP	EDGE OF PAVEMENT
EQUIP	EQUIPMENT
ER#	EXHAUST AIR REGISTER (#=TYPE A, B...)
EVC	END VERTICAL CURVE
EW	EACH WAY
EWS	ENGINEERING WORK STATION
EXIST	EXISTING

F

FC	FLEXIBLE CONNECTOR
FCU	FIELD CONTROL UNIT
FCP	FIELD CONTROL PANEL
FD	FLOOR DRAIN
FDDI	FIELD DISTRIBUTED DATA INTERFACE
FDN	FOUNDATION
FE	FLOW ELEMENT
FEH	FIELD ETHERNET HUB
FF	FINISHED FLOOR
FH	FIRE HYDRANT
FHC	FIELD HUB CONVERTER
FHE	FIELD HUB ENCLOSURE
FG	FINISHED GRADE
FIN	FINISHED
FN	FAN
FO	FOAM
FOC	FIBER OPTIC CONVERTER
FPM	FEET PER MINUTE
FPP	FIELD PANEL PATCH
FPS	FIRE PROTECTION SYSTEM
FT	FOOT OR FEET
FTG	FITTING OR FOOTING
FWS	FIELD WORKSTATION

G

GA	GAUGE
GAL	GALLON
GALV	GALVANIZED
GB	GRADE BREAK
GBD	GRAVITY BACKDRAFT DAMPER
GDS	GENERAL DATA SERVER
GMW	GROUNDWATER MONITORING WELL
GND	GROUND
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GR	GRINDER
GRT	GRAVITY THICKENER
GRV	GROOVED
GSN	GENERAL STRUCTURAL NOTES

H

H	HIGH
HCP	HORIZONTAL CONTROL POINT
HDP	HIGH DENSITY POLYETHYLENE
HDS	HISTORICAL DATA SERVER
HORIZ	HORIZONTAL
HPMP	HEAT PUMP
HPT	HIGH POINT
HP	HORSEPOWER

I

IAS	INFORMATION ACCESS SYSTEM
I\O	INPUT\OUTPUT
IE	INSTRUMENT ELECTRIC
IJS	INFLUENT JUNCTION STRUCTURE
IN.	INCH\INCHES
INSUL	INSULATION
INV	INVERT
IPH	INCHES PER HOUR
IPM	INCHES PER MINUTE
IPS	INCHES PER SECOND
ITP	INTERMEDIATE TERMINAL PANEL

J

JB	JUNCTION BOX
JC	JANITOR'S CLOSET
JT	JOINT

K

KCFM	1000 CUBIC FT. PER MINUTE
KSCFM	1000 STD. CUBIC FT. PER MINUTE

L

L	LANDSCAPE
LB	POUND
LB\DT	POUNDS PER DRY TON
LB\D	POUNDS PER DAY
LB\H	POUNDS PER HOUR
LCP	LOCAL CONTROL PANEL
LF	LINEAR FEET
LGTH	LENGTH
LI	LEVEL INDICATOR
LM	LOUVER MOTOR
LP	LOW POINT
LSH	LEVEL SWITCH HIGH
LSL	LEVEL SWITCH LOW
LSS	LANDSCAPING SPRINKLER SYSTEM

M

MAG	MAGNETIC
MASG	MARICOPA ASSOCIATION OF GOV.
MAX	MAXIMUM
MB	MACHINE BOLT
MCC	MOTOR CONTROL CENTER
MCS	MOTOR CONTROL STATION
MFC	MICROSCREEN FEED CHANNEL
MFR	MANUFACTURER
MG	MANUAL GATE
MGD	MILLION GALLONS PER DAY
MGL	MILLIGRAMS PER LITER
MH	MANHOLE
MIN	MINIMUM
MINS	MINUTES
MJ	MECHANICAL JOINT
ML	MILLILITER
MO	MASONRY OPENING
MSC	MICROSCREEN
MTD	MOUNTED
MV	MILLIVOLT
MVC	MID POINT VERTICAL CURVE
MW	MEGAWATT

N

NC	NORMALLY CLOSED
NIC	NOT IN CONTRACT
NK	NECK
NO	NORMALLY OPEN
NOM	NOMINAL

O

OA	OUTSIDE AIR
OC	ON CENTER
ODR	ODOR
ODRC	ODOR CONTROL
OF	OVERFLOW
OHE	OVERHEAD ELEC. POWER LINES
OPCTY	PERCENT OPACITY
OPNG	OPENING
OWS	OPERATOR WORK STATION

P

P-#	PUMP NO. #
PCA	PLANT COMPRESSED AIR
PCCP	PORTLAND CEMENT CONCRETE PAVEMENT
PCU	PROCESS CONTROL UNIT
PDR	PROCESS DATA ROUTER
PSB	PRIMARY SEDIMENTATION BASIN
PB	PULL BOX
PE	PLAIN END
PF	POWER FACTOR
PH	pH, HYDROGEN ION ACTIVITY
PHYD	POST HYDRANT
PLCS	PLACES
PI	PRESSURE INDICATOR
PLTE	PLATE
PL	PROPERTY LINE
PLC	PROGRAMMABLE LOGIC CONTROLLER
PMC	PROGRAM MANAGEMENT CENTER
POSS	POSITION SWITCH
PPB	PARTS PER BILLION
PPBV	PARTS PER BILLION VOLUME
PPD	POUNDS PER DAY
PPM	PARTS PER MILLION
PPMV	PARTS PER MILLION VOLUME
PPSEG	POUNDS PER SQUARE INCH GAUGE
PRESS	PRESSURE
PRT	PRINTER
PS	PRESSURE SWITCH
PV	PUMP VACUUM
PVNGS	PALO VERDE NUCLEAR GENERATING STATION

Q

QTY	QUANTITY

R

R	RADIUS
RCS	REMOTE CONTROL STATION
RED	REDUCER, REDUCING
REINF	REINFORCING, REINFORCEMENT
REQ'D	REQUIRED
RF	ROOF
RGS	RIGID GALVANIZED STEEL
RH	RELATIVE HUMIDITY
RIO	REMOTE INPUT\OUTPUT
RMS	ROOT MEAN SQUARE
RO	ROOF OPENING
ROT	ROTARY VALVE
RPH	REVOLUTIONS PER HOUR
RPS	REVOLUTIONS PER SECOND
RPM	REVOLUTIONS PER MINUTE
RTU	REMOTE TERMINAL UNIT
RV-#	ROOF VENT NO. #

S

S	STRUCTURAL
SAR	SUPPLY AIR REGISTER
SC	SCREW CONVEYOR
SCFH	STANDARD CUBIC FEET PER HOUR
SCFM	STANDARD CUBIC FEET PER MINUTE
SCH	SCHEDULE
SCR	SILICON CONTROLLED RECTIFIER
SEC	SECONDARY
SECS	SECONDS
SED	SEDIMENTATION
SG	SLUICE GATE
SH	SHIELDED
SF-#	SUPPLY AIR FAN NO. #
SFES	SERVER FAST ETHERNET SWITCH
SHF	SOLIDS HANDLING FACILITY
SHT	SHEET
SIM	SIMILAR
SLG	SLIDE GATE
SP IN WG	STATIC PRESSURE INCHES OF WATER GAGE
SPECS	SPECIFICATIONS
SQ	SQUARE
SRP	SALT RIVER PROJECT
SRUA	SALT RIVER VALLEY USERS ASSOCIATION
SS	SANITARY SEWER
SST	STAINLESS STEEL
STA	STATION
STD	STANDARD
STL	STEEL
SU	SURGE UNIT
SUB	SUBSTATION
SV-#	SOLENOID VALVE NO. #
SW	SIDEWALK

T

T	TELEPHONE
T/	TOP OF
T&B	TOP AND BOTTOM
TB	TERMINATION BOX
TBOC	TOP BACK OF CURB
TEMP	TEMPERATURE OR TEMPORARY
THK	THICK
TMH	TELEPHONE MANHOLE
TOC	TOP OF CONCRETE
TOD	TOP OF DUCT
TOG	TOP OF GRATING
TOR	TOP OF REGISTER
TOW/TW	TOP OF WALL
TOS	TOP OF SLAB
TPH	TONS PER HOUR
TR	TRANSDUCER
TTB	TELEPHONE TERMINATION BOARD
TYP	TYPICAL

U

UG	UNDER GROUND
UH-#	UNIT HEATER NO. #
UMHO	MICROMHO
UON	UNLESS OTHERWISE NOTED

V

VAC	VACUUM
VACBK	VACUUM BREAKER
VB	VALVE BOX
VCP	VITRIFIED CLAY PIPE
VD	VOLUME DAMPER
VDU	VIDEO DISPLAY UNIT
VEL	VELOCITY
VERT	VERTICAL
VF	VACUUM FILTER
VFD	VARIABLE FREQUENCY DRIVE
VG	VALLEY GUTTER
VMS	VIBRATION MONITORING SYSTEM
VS	VIEW STATION
VTR	VENT THROUGH ROOF

W

W/	WITH
WB	WET BULB
WC	WATER COLUMN
WD	WIDE
WP	WEATHERPROOF
WS	WATER SURFACE

X

XP	EXPLOSION PROOF
XFER	TRANSFER

PROCESS ABBREVIATIONS

A

ALM	ALUM
AMN	AMMONIA
AR	PROCESS AIR
AS	INSTRUMENT AIR
ASL	ALTERNATE SLUDGE
AW	ACID WASTE
AWD	ACID WASTE DRAIN

B

BCV	BALL CHECK VALVE
BFV	BUTTERFLY VALVE
BF	BLIND FLANGE
BP	BY-PASS
BS	BRINE SOLUTION
BV	BALL VALVE

C

CAS	CAUSTIC SODA
CD	CHLORINATOR DETECTOR
CEFF	CHLORINATED EFFLUENT
CEN	CENTRATE
CEN-EFF	CENTRATE EFFLUENT
CEN-ML	CENTRATE MIXED LIQUOR
CEN-RAS	CENTRATE RETURN ACTIVATED SLUDGE
CEN-SCUM	CENTRATE SCUM
CEN-SE	CENTRATE SECONDARY EFFLUENT
CEN-WAS	CENTRATE WASTE ACTIVATED SLUDGE
CFND	CENTRIFUGE DRAIN
CENV	CENTRATE VENT
CG	CHLORINE GAS
CGV	CHLORINE GAS VACUUM
CH2OR	COOLING WATER RETURN
CH2OS	COOLING WATER SUPPLY
CHL	CHLORINE LIQUID
CHWR	CHILLED WATER RETURN
CHWS	CHILLED WATER SUPPLY
CIP	CAST IRON PIPE
CISP	CAST IRON SOIL PIPE
CKV	CHECK VALVE
CL2	CHLORINE
CLS	CHLORINE SOLUTION
CO	CLEAN OUT
CPVC	CHLORINATED POLYVINYL CHLORIDE
CV	CHLORINATOR VENT
CW	DOMESTIC COLD WATER
CWD	CAUSTIC WASTE DRAIN
CWR	COOLING WATER RETURN
CWS	COOLING WATER SUPPLY

D

D	DRAIN
DAF	DISSOLVED AIR FLOATATION
DCL	DIGESTER CLEANING LINE
DEC	DECANT
DEFF	DECHLORINATED EFFLUENT
DG	DIGESTER GAS
DI	DUCTILE IRON
DIP	DUCTILE IRON PIPE
DISCH	DISCHARGE
DL	DRAIN LINE
DP	DILUTED POLYMER
DS	DIGESTED SLUDGE
DSF	DIESEL FUEL
DV	DIAPHRAGM VALVE
DW	DEWATERING
DWS	DEWATERED SLUDGE
DWW	DOMESTIC WASTE

E

EFF	EFFLUENT
EOF	EMERGENCY OVERFLOW
EPS	EFFLUENT PUMP STATION
ES	EFFLUENT SLUDGE

F

FA	FOUL AIR
FAD	FOUL AIR DUCT
FEC	FERRIC CHLORIDE
FL	FLOW LINE
FLG\FLGD	FLANGE\FLANGED
FLW	FILTERED WASTE
FOR	FUEL OIL RETURN
FOS	FUEL OIL SUPPLY
FRP	FIBERGLASS REINFORCED POLYVINYL

G

GC	GRIT CLEANING
GCEN	GRAVITY CENTRATE
GLDI	GLASS LINED DUCTILE IRON
GLV	GLOBE VALVE
GR	GRIT
GSP	GALVANIZED STEEL PIPE
GV	GATE VALVE
GW	GROUNDWATER

H

HCL	HYDROCHLORIC ACID
HPA	HIGH PRESSURE AIR
HPO	HIGH PRESSURE OIL
HPS	HIGH PRESSURE
HSL	STREAM HEATED
HW	SLUDGE HOT WATER
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY

I

IMLR	INTERMEDIATE MIXED LIQUOR RECYCLE
INF	INFLUENT
IPA	INTERMEDIATE PRESSURE AIR
IR	INTERMEDIATE RECYCLE
IRG	IRRIGATION

K

KGV	KNIFE GATE VALVE

L

LO	LUBE OIL

M

M	MECHANICAL
MA	METHYL ALCOHOL (METHANOL)
MD	MOTORIZED DAMPER
MAS	METHYL ALCOHOL SOLUTION
ML	MIXED LIQUOR

N

NAOCL	SODIUM HYPOCHLORITE
NG	NATURAL GAS
NPW	NON-POTABLE WATER
NPR	NON-POTABLE WATER RETURN
NPS	NON-POTABLE WATER SUPPLY
NSD	NON-SANITARY DRAIN
NV	NEEDLE VALVE

O

OCD	ODOR CONTROL DRAIN

P

PCA	PLANT COMPRESSED AIR
PC	PRIMARY SCUM
PD	PROCESS DRAIN
PE	PRIMARY EFFLUENT
PI	PRIMARY INFLUENT
POL	POLYMER
POLS	POLYMER SOLUTION
PSL	PRIMARY SLUDGE
PSK	PRIMARY SKIMMINGS
PW	POTABLE WATER

R

RAS	RETURNED ACTIVATED SLUDGE
RCP	REINFORCED CONCRETE PIPE
RD	ROOF DRAIN
RECIRC	RECIRCULATE\RECIRCULATION
RGR	RETURNED GRIT
ROT	ROTARY VALVE
RV	RELEASE VALVE
RW	REUSE WATER
RWW	RAW WASTE WATER

S

SAS	SCRUBBER AIR SAMPLING
SB	SODIUM BISULFITE
SBD	SCRUBBER BLOWDOWN
SBS	SODIUM BISULFITE SOLUTION
SC	SECONDARY SCUM
SCK	SLUDGE CAKE
SCR	SCREENINGS
SD	SULFUR DIOXIDE LIQUID
SDAF	STORM DRAIN ABOVE FLOOR
SDBF	STORM DRAIN BELOW FLOOR
SDG	SULFUR DIOXIDE GAS
SESL	SECONDARY EFFLUENT SLUDGE
SMP	SAMPLE
SNPW	SOFTENED NON-POTABLE WATER
SNPWV	SOFTENED NON-POTABLE WATER VENT
SP	SPARE PIPE OR FUTURE PIPE
SPD	SUMP PUMP DISCHARGE
SPRW	SPRAY WATER
SPW	SOFTENED POTABLE WATER
SR	SCRUBBER RECIRCULATION
SRV	SURGE RELIEF VALVE
SRW	SERVICE WATER
SSK	SECONDARY SKIMMINGS
SSL	SECONDARY SLUDGE
STM	STEAM
SU	STRUCTURAL UNDERDRAIN\FOOTING DRAIN
SUC	STRUCTURAL UNDERDRAIN COLLECTOR
SW	SANITARY WASTE
SWR	SEAL WATER

T

THK EFF	THICKENED EFFLUENT
TSL	THICKENED SLUDGE
TO	THICKENER OVERFLOW
TPS	THICKENED PRIMARY SLUDGE
TWAS	THICKENED WASTE ACTIVATED SLUDGE

V

V	VENT
VAC	VACUUM
VCP	VITRIFIED CLAY PIPE

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REVISION	ENGINEERING COMPANY	PROJECT NO.	PROJECT NAME	DATE	CAD FILE NAME	DWG NUMBER	REMARKS

Registered Professional Engineer (Civil)
CERTIFICATE NO.
41013
FERNANDO SARMIENTO
Date Signed
ARIZONA, U.S.A.

GREELEY AND HANSEN
2800 N. 44TH STREET, SUITE 650
PHOENIX, AZ 85008

REVISIONS				
NO.	BY	DATE	CKD	REMARKS

DES MT/RP
DWN RAM
CKD FS

City of Phoenix

CITY OF PHOENIX
WATER SERVICES DEPARTMENT
COLLECTION SYSTEMS
REMOTE FACILITIES

GENERAL

LIFT STATION 76 PHASE II EXPANSION
ABBREVIATIONS

CITY PROJECT NO. WS90400067

DATE: MAY 2023

G02 SHEET 3 OF 41

CAD FILE: 04276.05_G02

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GENERAL NOTES

1. THE ELEVATION OF EXISTING TOPOGRAPHY SHOWN MAY VARY. GRADE TOLERANCE IS ± 1 FOOT.
2. PORTIONS OF THE TOPOGRAPHIC AND SUBSURFACE FEATURES SHOWN WERE DEVELOPED BASED ON AERIAL SURVERYING AND RECORD DRAWINGS OF LIFT STATION 76 PROVIDE BY THE CITY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD VERIFICATION OF THE ACCURACY OF THE SHOWN FEATURES.
3. THE CONTRACTOR SHALL CONTACT THE UTILITY PRIOR TO PROCEEDING WITH WORK WHICH INVOLVES OR AFFECTS EXISTING FEATURES OR AFFECTS EXISTING UTILITIES.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACING AND INSTALLING ANY EXISTING SURVEY MONUMENTS REMOVED OR DAMAGED DURING CONSTRUCTION.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL PERMITS WHICH ARE REQUIRED PRIOR TO CONSTRUCTION, EXCEPT AS DEFINED BY THE SPECIFICATIONS.
6. ALL UTILITIES SHALL BE PROTECTED FROM DAMAGE AS A RESULT OF THE WORK. THE CONTRACTOR SHALL RELOCATE, REPAIR OR REPLACE ANY UTILITIES TO THE SATISFACTION OF THE UTILITIES OR THE OWNER.
7. PROVIDE TEMPORARY THRUST RESTRAINT FOR EXISTING PIPING WHENEVER THE WORK REQUIRES. CONTRACTOR TO REPLACE OR RESTORE THE EXISTING RESTRAINT SYSTEM TO LIKE NEW CONDITION.
8. SUBSURFACE EXPLORATION WERE PERFORMED BY SPEEDIE AND ASSOCIATES ON NOVEMBER 30TH, 2016. SUBSURFACE EXPLORATION WAS COMPLETED AS A PART OF THE PHASE I IMPROVEMENTS TO THE SITE, REFER TO PHASE I RECORD DRAWINGS FOR SOIL BORING INFORMATION.
9. WORK LIMITS ARE AS SHOWN UNLESS OTHERWISE NOTED.
10. (*) INDICATES DIMENSIONS TO BE DETERMINED BASED UPON EQUIPMENT MANUFACTURER SELECTED.
11. (**) INDICATES DIMENSIONS TO BE FIELD VERIFIED.
12. EXISTING EQUIPMENT TO BE REMOVED AND SALVAGED WILL BE MARKED BY OWNER PRIOR TO WORK UNLESS OTHERWISE NOTED ON DRAWINGS OR SPECIFICATIONS. CONTRACTOR TO DELIVER SALVAGED EQUIPMENT AS DIRECTED BY ENGINEER.
13. CONTRACTOR TO MAINTAIN LIFT STATION ROADWAY ACCESS TO ALL FACILITIES FOR MAINTAINING LIFT STATION OPERATIONS DURING CONSTRUCTION. IF THE WORK REQUIRES INTERRUPTION OF EXISTING ACCESS TO OPERATING LIFT STATION FACILITIES THE CONTRACTOR SHALL PROVIDE TEMPORARY ACCESS (APPROVED BY THE ENGINEER) TO THESE FACILITIES.
14. DEMOLITION WORK WILL REQUIRE STAGED DEMOLITION TO MAINTAIN LIFT STATION OPERATION – SEE SPECIFICATIONS FOR REQUIREMENTS.
15. REFERENCES TO M.A.G. STANDARD DETAILS REFER TO THE "UNIFORM STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION" SPONSORED AND DISTRIBUTED BY THE MARICOPA ASSOCIATION OF GOVERNMENT (LATEST VERSION).
16. REFERENCES TO C.O.P. STANDARD DETAILS REFER TO THE "PHOENIX SUPPLEMENTAL STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION" ENGINEERING DEPARTMENT, CITY OF PHOENIX, (LATEST VERSION).
17. ALL KNOWN EXISTING BURIED PIPING, ELECTRICAL DUCT BANKS AND OTHER BURIED UTILITIES ARE SHOWN IN THE APPROXIMATE LOCATION AND ARE FOR INFORMATIONAL PURPOSES TO INDICATE THE EXISTENCE OF SUCH UTILITIES. CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND EXPOSING BURIED PIPE, ELECTRICAL DUCT BANK AND OTHER ON SITE UTILITIES PRIOR TO COMMENCING WORK.
18. THE CONTRACTOR SHALL ADJUST "ALL" EXISTING MANHOLES, VALVE BOXES, CLEANOUTS, BLIND FLANGED PIPING AND FIRE HYDRANTS WITHIN WORK LIMITS REQUIRED TO MATCH PROPOSED FINAL GRADE ACCORDING TO M.A.G. STANDARD DETAILS NO. 270, 360, 391, AND 422.
19. PIPING, ELECTRICAL DUCTBANKS, INSTRUMENTATION AND OTHER FACILITIES TO BE CONTINUED BY OTHER CONSTRUCTION CONTRACTS SHALL: (IF THE WORK BY OTHERS IS NOT IN PLACE) BE TERMINATED AT THE LIMITS SHOWN, TESTED AND CAPPED WITH AN APPROPRIATE TERMINATION FLANGE OR DEVICE PRIOR TO COMPLETION OF THE WORK. SITE FACILITIES SHALL BE LOCATED (SURVEYED) BY THE LIFT STATION COORDINATES AND ELEVATIONS. MARKERS EXTENDING 4'–0" ABOVE FINISHED GRADE SHALL BE PROVIDED WITH THE ABOVE INFORMATION. PROVIDE THE ENGINEER WITH THE SURVEY NOTES UPON COMPLETION OF THE WORK; OR (IF THE WORK BY OTHERS IS IN PLACE) BE TERMINATED AND TESTED TO THE LIMIT OF THE WORK. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY APPURTENANCES AND ACCESSORIES, NUTS, BOLTS, ETC. REQUIRED TO COMPLETE THE CONNECTION TO THE WORK BY OTHERS.
20. A STORM WATER MANAGEMENT PLAN (SWMP) THAT MEETS THE REQUIREMENTS OF CITY OF PHOENIX CODE, SECTION 32C MUST BE PREPARED AND BE PRESENT ON SITE AT ALL TIMES DURING CONSTRUCTION. FOR AREAS OF DISTURBANCE THAT ARE 1 ACRE OR GREATER, AN ARIZONA POLLUTANT DISCHARGE ELIMINATION SYSTEM (AZPDES) COMPLIANT STORM WATER POLLUTION PREVENTION PLAN (SWPPP) CAN BE USED TO SATISFY THE REQUIREMENTS OF THE SWMP.
21. THE COORDINATES SHOWN AND NOTED WITHIN THE CONTRACT DOCUMENTS ARE BASED ON THE LIFT STATION 76 COORDINATE SYSTEM. REFERENCE TO BENCHMARKS ARE GIVEN WITH ELEVATION, NORTH OR SOUTH AND EAST OR WEST COORDINATES.
22. EXISTING STRUCTURES AND FACILITIES WHICH ARE TO BE DEMOLISHED ARE SHOWN ON DEMOLITION SHEETS, AND SHEET E–04 "ELECTRICAL SITE PLAN DEMO" FOR SPECIFIC REQUIREMENTS REGARDING DEMOLITION OF EXISTING FACILITIES.
23. INSTALL AIR/VACUUM RELIEF ASSEMBLIES AT ALL HIGH POINTS ON THE PW, RW AND PROCESS PIPING. ACTUAL LOCATIONS TO BE DETERMINED DURING CONSTRUCTION. SEE TYPICAL DETAILS.
24. ALL BURIED PIPING SHALL BE BACKFILLED ACCORDING TO THE CONTRACT DOCUMENTS AND EXISTING PAVEMENT REPAIRED PER M.A.G. STANDARD DETAIL NO. 200, "T" TOP.
25. WHERE BURIED PIPING CROSSES EXISTING BURIED PIPING, CROSSINGS SHALL BE CONSTRUCTED PER M.A.G. STANDARD DETAILS NO. 403, 404 AND 405.
26. FOR ALL BURIED VALVES, CONTRACTOR SHALL CONSTRUCT BLOCKING PER M.A.G. STANDARD DETAIL NO. 301 AND SHALL PROVIDE A VALVE BOX PER M.A.G. STANDARD DETAIL NO. 391, TYPE "A".
27. CONTOURS INDICATE FINAL GRADES.
28. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS BEFORE STARTING WORK AND SHALL IMMEDIATELY NOTIFY THE ENGINEER OF ANY DISCREPANCIES.
29. WHERE CONSTRUCTION DETAILS ARE SHOWN OR NOTED FOR ANY PART OF THE WORK, DETAILS SHALL BE THE SAME AS FOR OTHER SIMILAR WORK.
30. UNLESS DETAILED, SPECIFIED OR INDICATED OTHERWISE, CONSTRUCTION SHALL BE AS INDICATED IN THE APPLICABLE TYPICAL DETAILS AND GENERAL NOTES. TYPICAL DETAILS ARE MEANT TO APPLY EVEN THOUGH NOT REFERENCED AT SPECIFIC LOCATIONS OR IN SPECIFIC DRAWINGS.
31. MINIMUM COVER OVER ALL BURIED PIPING SHALL BE 3'–0" UNLESS OTHERWISE SHOWN OR APPROVED BY ENGINEER. LESS THAN 3'–0" COVER SHALL BE CONCRETE ENCASED. SEE TYPICAL DETAIL.
32. THE WET WELL IS PROTECTED AGAINST CORROSION TO PROVIDE AT LEAST A 20–YEAR OPERATIONAL LIFE.

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Registered Professional Engineer Certificate No. 41013 FERNANDO SARMIENTO Date Signed 6/30/23 ARIZONA, U.S.A.

GREELEY AND HANSEN
2800 N. 44TH STREET, SUITE 650
PHOENIX, AZ 85008

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CITY OF PHOENIX
WATER SERVICES DEPARTMENT
COLLECTION SYSTEMS
REMOTE FACILITIES

GENERAL

LIFT STATION 76 PHASE II EXPANSION
GENERAL NOTES

CITY PROJECT NO. WS90400067

DATE: MAY 2023

G03 SHEET 4 OF 41

CAD FILE: 04276.05_G03

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LANDSCAPE SYMBOLS

VEGETATION

- BUSH: 3 FT DIA
- BUSH: 4 FT DIA
- BUSH: 5 FT DIA
- BUSH: 6 FT DIA
- BUSH: BIRD OF PARADISE
- BUSH: BRITTLE BUSH
- BUSH: CHUPAROSA
- BUSH: HOP
- BUSH: SAGE
- BUSH: SAGUARO
- TREE: ACACIA
- TREE: MESQUITE
- TREE: MISCELLANEOUS
- TREE: PALM
- TREE: PALO VERDE
- TREE: EXISTING
  NOTE: DIAMETER OF TREE TO VARY PER TREE DIA. THIS SYMBOL DRAWING AT 1FT DIAMETER TREE, SCALE TO FIT CORRECT DIAMETER ACCORDINGLY
- TREE: DESERT SPOON
- TREE: INDIAN FIG PRICKLY PEAR

IRRIGATION

- SADDLE TAP TO NPW LINE
- BRASS PRESSURE REGULATOR
- VALVE
- GATE VALVE
- FLUSHING END CAP, INSTALL IN SEPARATE 10" PLASTIC VALVE BOX
- BRASS GATE VALVE (SAME SIZE AS MAINLINE)
- ELECTRONIC REMOTE CONTROL VALVE
- PRESET PRESSURE REGULATOR (INSTALL IN SEPARATE 10" PLASTIC VALVE BOX
- PVC WIRE SLEEVE, 1 ½" DIAMETER SCHEDULE 40
- PVC SLEEVE, 2X PIPE DIAMETER SCHEDULE 40
- PVC MAINLINE CLASS 200
- PVC PIPE TO TREE EMITTERS CLASS 200
- PVC PIPE TO SHRUB EMITTERS CLASS 200
- VB — VALVE BOX

SURVEY SYMBOLS

- BENCHMARK
- MONUMENT
- CONTROL POINT
- MH — MANHOLE
- FH — FIRE HYDRANT (FH)

GRADING & DRAINAGE SYMBOLS

- BOTTOM OF SLOPE
- RIP-RAP
- SIGN, 1 POST
- SIGN, 2 POST
- CB — CATCH BASIN

SOILS SYMBOLS

- BORING
- MONITORING WELL
- PIEZOMETER
- TEST PIT

FEATURES AND SYMBOLS

- SAFETY POST (BOLLARD) SEE M.A.G. STD DETAIL NO. 140 UNLESS NOTED OTHERWISE
- CO — CLEAN OUT
- PH — POST HYDRANT (PH) OR HOSE STATION (HS)
- QD — QUICK DISCONNECT AT STORM DRAINAGE STANDPIPE
- EMH-11 — ELECTRICAL MANHOLE W/DESIGNATION NO.
- B-3 — BORING LOCATION AND BORING NUMBER DESIGNATION
- DRAINAGE FLOW LINE
- ELECTRICAL TOWER
- N 1000.00 E 800.00 OR E 800.00 N 1000.00 — PLANT COORDINATES (FOR STRUCTURES COORDINATE REPRESENTS EDGE OF STRUCTURE OR EXPOSED CONCRETE SLAB)
- PRECAST SAFETY CURB
- SECURITY FENCE
- STEEL RAILING
- BARRICADE
- EXISTING FENCE
- LIMITS OF WORK UNDER THIS CONTRACT

YARD PIPING IDENTIFICATION (PI) ABBREVIATONS

FM	FORCE MAIN
FO	FIBER OPTIC
IRR	IRRIGATION
OHE	OVERHEAD ELECTRIC
OHT	OVERHEAD TELEPHONE
SD	STORM DRAIN
SS	SANITARY SEWER
UE	UNDERGROUND ELECTRIC
UG	UNDERGROUND GAS
UT	UNDERGROUND TELEPHONE
W	WATER

- STRUCTURES/EQUIPMENT TO BE REMOVED OR DEMOLISHED
- SITE PLAN – STRUCTURES (BY OTHERS)
- SITE PLAN – NEW STRUCTURES
- 12" PI (MATERIAL) / 36" PI (MATERIAL) — PROPOSED BURIED YARD PIPING, SEE ABBREVIATIONS FOR PIPING IDENTIFICATION
- 12" PI (MATERIAL) / 36" PI (MATERIAL) — FUTURE BURIED YARD PIPING, SEE ABBREVIATIONS FOR PIPING IDENTIFICATION
- 12" PI (MATERIAL) / 36" PI (MATERIAL) — EXISTING BURIED YARD PIPING, SEE ABBREVIATIONS FOR PIPING IDENTIFICATION
- 12" PI (MATERIAL) / 36" PI (MATERIAL) — PROPOSED ABOVE GROUND YARD PIPING, SEE ABBREVIATIONS FOR PIPING IDENTIFICATION
- 12" PI (MATERIAL) / 36" PI (MATERIAL) — FUTURE ABOVE GROUND YARD PIPING, SEE ABBREVIATIONS FOR PIPING IDENTIFICATION
- 12" PI (MATERIAL) / 36" PI (MATERIAL) — EXISTING ABOVE GROUND YARD PIPING, SEE ABBREVIATIONS FOR PIPING IDENTIFICATION
- 940 — PROPOSED CONTOUR WITH GRADE (5'-0" INTERVALS)
- 943 — PROPOSED CONTOUR WITH GRADE (1'-0" INTERVALS)
- + 959 — SPOT ELEVATION
- EXISTING RIBBON CURB
- EXISTING VERTICAL CURB & GUTTER
- EXISTING VALLEY GUTTER
- EXISTING SINGLE CURB
- RIBBON CURB, PER MAG STD DET NO 220, TYPE – B
- VERTICAL CURB & GUTTER, PER MAG STD DET NO 220, TYPE – A
- VALLEY GUTTER, PER MAG STD DET NO 240
- SINGLE CURB PER MAG STD DET NO 222, TYPE – A

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REVISIONS				
NO.	BY	DATE	CKD	REMARKS

DES MT/RP
DWN RAM
CKD FS

City of Phoenix

CITY OF PHOENIX
WATER SERVICES DEPARTMENT
COLLECTION SYSTEMS
REMOTE FACILITIES

CIVIL

LIFT STATION 76 PHASE II EXPANSION
LEGEND

CITY PROJECT NO. WS90400067
DATE: MAY 2023
C01 SHEET 5 OF 41
CAD FILE: 04276.05_C01

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GENERAL SITE NOTES

1. APPROVAL OF THESE PLANS SHALL NOT PREVENT THE CITY FROM REQUIRING CORRECTION OF ERRORS IN THE PLANS WHERE SUCH ERRORS ARE SUBSEQUENTLY FOUND TO BE IN VIOLATION OF ANY LAW, ORDINANCE OR OTHER HEALTH/SAFETY ISSUE.
2. ALL CONSTRUCTION SHALL CONFORM TO MAG (MARICOPA ASSOCIATION OF GOVERNMENTS) SPECIFICATIONS AND DETAILS AND THE CITY OF PHOENIX SUPPLEMENTS TO MAG SPECIFICATIONS AND DETAILS, UNLESS MODIFIED ON THE PLANS OR IN THE PROJECT SPECIFICATIONS.
3. A SIX (6) FOOT MINIMUM HORIZONTAL SEPARATION FROM ANY UNDERGROUND UTILITY SHALL BE PROVIDED FOR SEWER MAINS, SEWER SERVICES, WATER MAINS, AND WATER SERVICES. THE MINIMUM HORIZONTAL SEPARATION IS MEASURED FROM OUTSIDE OF SEWER MAIN, SEWER SERVICE, WATER MAIN, OR WATER SERVICE TO OUTSIDE OF UNDERGROUND UTILITY.
4. A ONE (1) FOOT MINIMUM VERTICAL SEPARATION FROM ANY DRY UNDERGROUND UTILITY CROSSING SHALL BE PROVIDED FOR SEWER MAINS AND WATER SERVICES. THE MINIMUM VERTICAL SEPARATION IS MEASURED FROM OUTSIDE OF SEWER MAIN, SEWER SERVICE, WATER MAIN, OR WATER SERVICE TO OUTSIDE OF DRY UNDERGROUND UTILITY.
5. A TWO (2) FOOT MINIMUM VERTICAL SEPARATION SHALL BE PROVIDED BETWEEN ANY SEWER MAIN OR STORM DRAIN CROSSING A WATER MAIN. THE MINIMUM VERTICAL SEPARATION IS MEASURED FROM OUTSIDE OF WATER MAIN TO OUTSIDE OF SEWER MAIN OR STORM DRAIN MAIN. SEE MAG STANDARD DETAIL 404 FOR ADDITIONAL INFORMATION AND/OR PROVISIONS FOR CLEARANCE.
6. EXCEPTIONS OR DEVIATIONS FROM THE ABOVE MINIMUM CLEARANCES MUST BE APPROVED AND SHOWN ON THE APPROVED WATER AND SEWER PLANS. WHEN UTILITY CONFLICTS ARE FOUND DURING CONSTRUCTION, ALL CHANGES AND REVISIONS MUST BE PRECEDED BY AN APPROVED PLAN REVISION.
7. ANY AND ALL MORE STRINGENT SEPARATION REQUIREMENTS REQUIRED BY FEDERAL, STATE, COUNTY OR LOCAL CODES OR ORDINANCES TAKE PRECEDENCE.
8. TRAFFIC REGULATIONS: ALL WORK MUST COMPLY WITH REQUIREMENTS OF THE CURRENT CITY OF PHOENIX "MCDOT TRAFFIC BARRICADE MANUAL".
9. TRENCH EXCAVATION, BACKFILLING AND COMPACTION SHALL COMPLY WITH MAG SECTION 601 AND COP SUPPLEMENTS.
10. CONCRETE OR ASPHALT DAMAGED DURING THE COURSE OF CONSTRUCTION SHALL BE REMOVED AND REPLACED IN KIND PRIOR TO FINAL INSPECTION.
11. "PER CITY OF PHOENIX ORDINANCE G-4396, THESE PLANS ARE FOR OFFICIAL USE ONLY AND MAY NOT BE SHARED WITH OTHERS EXCEPT AS REQUIRED FOR THE CONSTRUCTION OF THE PUBLIC WORKS FACILITIES SHOWN HEREON. THE PROJECT OWNER AND THE OWNER'S LENDERS CONSULTANTS, CONTRACTORS AND SUBCONTRACTORS ARE PROHIBITED FROM DISCLOSING THE PLANS AND SPECIFICATIONS TO ANY PERSONS OTHER THAN THOSE WHO HAVE A NEED TO KNOW THE INFORMATION FOR THE PURPOSE OF THE PROJECT".
12. CONTRACTOR WILL NOT PAINT ANY EXPOSED PVC OR CPVC PIPING.
13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL PERMITS REQUIRED FOR CONSTRUCTION EXCEPT AS DEFINED IN THE SPECIFICATIONS.

ENGINEERING NOTES

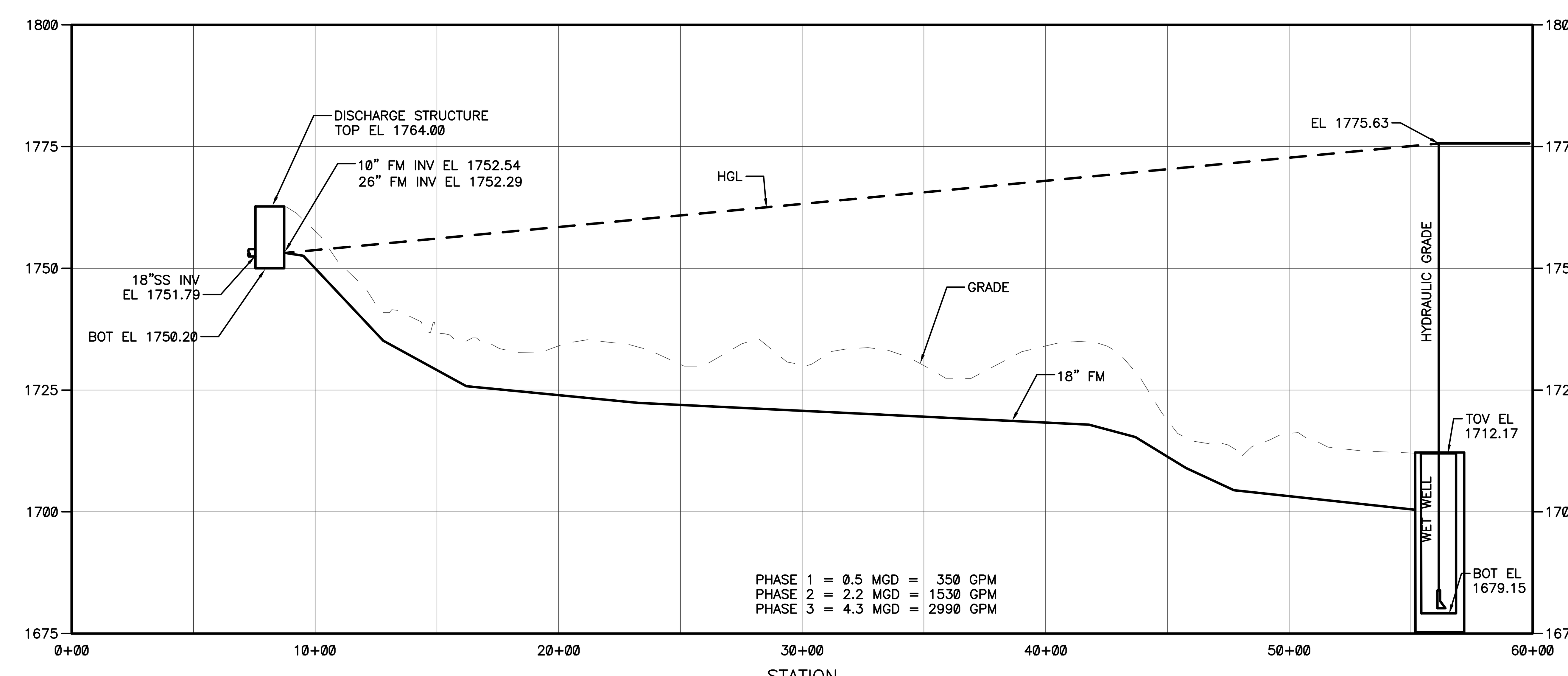
1. A THOROUGH ATTEMPT HAS BEEN MADE TO SHOW THE LOCATIONS OF ALL UNDERGROUND CONSTRUCTION AND UTILITY LINES IN THE WORK AREA. HOWEVER THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF UTILITIES IN ADVANCE OF TRENCHING.
2. THE CONTRACTOR SHALL THOROUGHLY SATISFY HIMSELF AS TO THE ACTUAL CONDITIONS. REQUIREMENTS OF THE WORK.
3. THE ENGINEER WILL NOT BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, PROCEDURES FOR SAFETY PRECAUTIONS OR PROGRAMS UTILIZED IN CONNECTION WITH THE WORK AND WILL NOT BE RESPONSIBLE FOR THE CONTRACTORS FAILURE TO CARRY OUT THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
4. THE ENGINEER SHALL NOT BE RESPONSIBLE FOR COORDINATING THE RELOCATION OF UTILITIES, POWER POLES. ETC.
5. THE CONTRACTOR SHALL MAKE NO CLAIM AGAINST THE OWNER OR THE ENGINEER REGARDING ALLEGED INACCURACY OF CONSTRUCTION STAKES SET BY THE ENGINEER UNLESS ALL SURVEY TAKES SET BY THE ENGINEER ARE MAINTAINED INTACT AND CAN BE VERIFIED AS TO THEIR ORIGIN. IF IN THE OPINION OF THE ENGINEER THE STAKES ARE NOT MAINTAINED INTACT AND CANNOT BE VERIFIED AS TO THEIR ORIGIN, ANY REMEDIAL WORK REQUIRED TO CORRECT ANY ITEM OR IMPROPER CONSTRUCTION WORK SHALL BE PERFORMED AT THE SOLE EXPENSE OF THE RESPONSIBLE CONTRACTOR OR SUBCONTRACTOR.
6. NOTHING CONTAINED IN THE CONTRACT DOCUMENTS SHALL CREATE NOR SHALL BE CONSTRUED TO CREATE ANY CONTRACTUAL RELATIONSHIP BETWEEN THE ENGINEER AND THE CONTRACTOR OR ANY SUBCONTRACTOR.
7. THE ENGINEER WILL MAKE FIELD AS-BUILT MEASUREMENTS OF THE WORK UPON NOTIFICATION OF THE OWNER OR OWNER'S REPRESENTATIVE THAT THE PIPE WORK IS COMPLETE AND READY FOR AS-BUILT SURVEY. IF THE CONTRACTOR DOES NOT LEAVE THE TRENCHES OPEN SO THAT THE ACTUAL PIPE LINES AND SERVICES CAN BE OBSERVED, THE CONTRACTOR WILL EXPOSE THE UNES AND SERVICES TO ALLOW FOR ACCURATE AS-BUILT1NG. IF THE TRENCHES ARE BACKFILLED AND OBSCURED TO THE POINT THAT THE AS-BUILT MEASUREMENTS CANNOT BE PERFORMED. THE ENGINEER WILL NOT BE RESPONSIBLE FOR PROVIDING ACCURATE AS-BUILT MEASUREMENTS.

GENERAL NOTES FOR RIGHT-OF-WAY PERMITS

1. ALL WORK SHALL CONFORM TO THE REVISED EDITION OF THE UNIFORM STANDARD SPECIFICATIONS AND DETAILS FOR PUBLIC WORKS CONSTRUCTION PUBLISHED BY THE MARICOPA ASSOCIATION OF GOVERNMENTS (MAG) AS AUTHORIZED AND MODIFIED BY THE MOST CURRENT MCDOT SUPPLEMENT TO THE MAG UNIFORM STANDARD SPECIFICATIONS AND DETAILS AND NON-CONFLICTING PROJECT SPECIAL PROVISIONS. ALL WORK MUST ALSO COMPLY WITH RESOLUTION 2001-01 MARICOPA COUNTY RESOLUTION FOR PERMITS TO WORK IN DEDICATED RIGHT-OF-WAY AND RESOLUTION 2001-02 MARICOPA COUNTY RESOLUTION FOR STREET IMPROVEMENTS, INSTALLATION OF UTILITIES AND TRAFFIC CONTROL. ANY EXCEPTIONS MUST RECEIVE EXPLICIT APPROVAL FROM MCDOT AND SHALL BE IDENTIFIED ON THE PLANS AS HAVING EXPLICIT APPROVAL FROM MCDOT. ALL CLEAR ZONE HAZARDS SHALL BE MITIGATED IN A MANOR APPROVED BY MCDOT AT NO COST TO THE COUNTY.
2. THE ENGINEERING DESIGNS ON THESE PLANS ARE ONLY APPROVED BY MCDOT IN CONCEPT AND NOT IN DETAIL. CONSTRUCTION QUANTITIES ON THESE PLANS ARE NOT VERIFIED BY MCDOT. APPROVAL OF THESE PLANS ARE FOR PERMIT PURPOSES ONLY AND SHALL NOT PREVENT MCDOT FROM REQUIRING CORRECTION OF ERRORS IN THE PLANS WHERE SUCH ERRORS ARE SUBSEQUENTLY FOUND TO BE IN VIOLATION OF ANY LAW, ORDINANCE, HEALTH, SAFETY, THE MCDOT ROADWAY DESIGN MANUAL, OR OTHER DESIGN ISSUES.
3. AN APPROVED SET OF PLANS SHALL BE ON THE SITE DURING CONSTRUCTION AND AVAILABLE TO MCDOT AND OTHER INSPECTORS.
4. ALL BOX CULVERTS CONSTRUCTED IN THE PUBLIC RIGHT-OF-WAY SHALL COMPLY WITH ARIZONA DEPARTMENT OF TRANSPORTATION (ADOT) LATEST DESIGN SPECIFICATIONS AND STANDARDS. MINIMUM CLEAR HEIGHT OF BOX CULVERT SHALL BE 4 FEET.
5. CONTRACTOR TO OBTAIN MCDOT PERMITS PRIOR TO CONSTRUCTION WITHIN COUNTY RIGHT-OF-WAY. AND ALL NECESSARY PERMITS FROM OTHER AGENCIES AND FROM LOCAL GOVERNMENTS FOR WORK WITHIN THEIR JURISDICTION.
6. CONTRACTOR SHALL NOTIFY THE MCDOT INSPECTION DEPT. AT LEAST 24 HOURS IN ADVANCE OF ANY CONSTRUCTION AT (602) 506-8606.
7. CONTRACTOR PERFORMING CONSTRUCTION OR EXCAVATING OPERATIONS IS RESPONSIBLE FOR LOCATING AND RELOCATING ALL UTILITIES IN CONFLICT AT NO EXPENSE TO MARICOPA COUNTY. THE CONTRACTOR SHALL CONTACT "BLUE STAKE" AT (602) 263-1100 PRIOR TO BEGINNING CONSTRUCTION.
8. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ANY REQUIRED PERMITS FOR EARTH MOVING FROM MARICOPA COUNTY AIR QUALITY DEPARTMENT'S DUST COMPLIANCE DIVISION (602) 506-6010 PRIOR TO CONDUCTING EXCAVATION OPERATIONS. A COPY OF THE PERMIT AND DUST CONTROL PLAN SHALL BE SUBMITTED TO THE COUNTY ENGINEER PRIOR TO COMMENCEMENT OF ANY EARTHMOVING ACTIVITIES.
9. PRIOR TO CONDUCTING EXCAVATION OPERATIONS, THE CONTRACTOR SHALL OBTAIN FROM THE ARIZONA STATE HISTORICAL PRESERVATION OFFICER (602) 542-4009, RECOMMENDATIONS REGARDING THE NEED FOR CULTURAL RESOURCES (ARCHAEOLOGICAL) CLEARANCE. ALL DISCOVERIES OF HUMAN REMAINS, CULTURAL ARTIFACTS, OR PALEONTOLOGICAL REMAINS SHALL BE REPORTED TO THE ARIZONA STATE MUSEUM AND MCDOT. UPON DISCOVERY, CONTRACTOR SHALL CEASE OPERATIONS IN THE VICINITY OF THE FIND AND PROTECT THE DISCOVERY AREA FROM FURTHER DISTURBANCE UNTIL THE FIND CAN BE PROFESSIONALLY INVESTIGATED BY THE ARIZONA STATE MUSEUM AND MCDOT.
10. EXCEPT UNDER EMERGENCY CONDITIONS, ROADS SHALL NOT BE CLOSED FOR CONSTRUCTION ACTIVITY UNLESS PRIOR APPROVAL IS OBTAINED FROM THE MCDOT TRANSPORTATION DIRECTOR OR HIS REPRESENTATIVE.

GENERAL NOTES FOR RIGHT-OF-WAY PERMITS – CONT

11. PRIOR TO MOVING OR DESTROYING PROTECTED NATIVE PLANT SPECIES, THE CONTRACTOR SHALL FILE A FORMAL NOTICE OF INTENT WITH THE ARIZONA DEPARTMENT OF AGRICULTURE NATIVE PLANTS (602) 542-6408.
12. PRIOR TO INSTALLATION OF CURB, GUTTER, SIDEWALK, BASE COURSE AND WEARING SURFACE, SUBMIT SOIL TEST(S) OF SUBGRADE AND REVISED PAVEMENT DESIGN/CALCULATIONS TO MCDOT FOR REVIEW AND APPROVAL. IF SUBGRADE STABILIZATION IS REQUIRED. THE AREA STABILIZED SHALL BE FROM BACK OF SIDEWALK TO BACK OF SIDEWALK AND MATCH THE STABILIZATION DEPTH OF THE PAVEMENT STRUCTURE.
13. ASPHALT MIX DESIGN SHALL BE SUBMITTED TO MCDOT A MINIMUM OF 48 HOURS PRIOR TO PLACING ANY ASPHALT COURSES. (TRENCH WORK EXCLUDED.) ALL PAVED TURNOUTS SHALL HAVE THE SAME ASPHALT AND BASE REQUIREMENTS AS THE ADJACENT ROADWAY UNLESS NOTED OTHERWISE.
14. ALL COMPACTION AND BACKFILL WITHIN COUNTY RIGHT-OF-WAY SHALL CONFORM TO THE MCDOT SUPPLEMENT TO MAG SPECIFICATION SECTION 601. BACKFILL UNDER EXISTING PAVEMENT, CURB AND GUTTER, ROADWAY SHOULDERS, AND UNPAVED ROADWAYS SHALL CONSIST OF ONE-HALF (1/2) OR ONE SACK CLSM. UNPAVED ROADWAY AREAS INCLUDE THE TRAVELED WAY PLUS FIVE FEET BEYOND THE TRAVELED WAY.
15. PAVEMENT WIDENING AND PAVEMENT REPLACEMENT SHALL CONFORM TO REQUIREMENTS OF SPECIFICATION SECTION 336. PAVEMENT CUTS SHALL NOT BE LOCATED WITHIN A LANE WHEEL PATH. THE LANE WHEEL PATH IS THE ENTIRE LANE WIDTH EXCEPT THE AREA WITHIN ONE FOOT OF A LANE LINE STRIPE AND EXCEPT THE CENTER TWO FEET OF THE TRAVEL LANE.
16. ALL EXISTING PAVEMENT MARKINGS, TRAFFIC SIGNS AND SIGNAL EQUIPMENT THAT NEED TO BE REMOVED, REPLACED, RELOCATED OR REPAIRED BECAUSE OF CONTRACTOR'S WORK WILL BE DONE BY THE CONTRACTOR AT HIS EXPENSE. ALL SALVAGED SIGNS SHALL BE DELIVERED TO THE TRAFFIC OPS BUILDING AT 2909 W. DURANGO ST. ARRANGEMENTS CAN BE MADE FOR DELIVERY BY CALLING (602) 506-8662. ALL NEW STREET NAME SIGNS SHALL BE PROVIDED AND INSTALLED BY PERMITTEE AT NO EXPENSE TO MARICOPA COUNTY.
17. PAVEMENT MARKING, SIGNING AND SIGNAL WORK WILL BE INSPECTED AND SHALL MEET COUNTY STANDARDS BEFORE RELEASE OF BOND.
18. THE CONTRACTOR SHALL RESTORE ALL DISTURBED AREAS WITHIN THE RIGHT-OF-WAY TO A CONDITION EQUAL TO OR BETTER THAN PRIOR EXISTING CONDITIONS PER MAG 107.9. DISPOSAL OF ALL WASTE MATERIAL WILL BE THE RESPONSIBILITY OF THE CONTRACTOR.



HYDRAULIC PROFILE
SCALE: NOT TO SCALE

FACILITY DRAWINGS
This drawing was supplied by a Consultant Engineer from a post construction project. The original construction drawing was modified based on information provided by the Contractor to provide the Record Drawing. The City does not warranty this drawing to be a complete and accurate portrayal of facilities as they exist in the field.

FOR CITY OF PHOENIX USE ONLY – REFERENCE CID NUMBER: #

REVISION	ENGINEERING COMPANY	PROJECT NO.	PROJECT NAME	DATE	CAD FILE NAME	DWG NUMBER	REMARKS

REGISTERED PROFESSIONAL ENGINEER (CIVIL) CERTIFICATE NO. 41013 FERNANDO SARMIENTO ARIZONA, U.S.A.

GREELEY AND HANSEN
2800 N. 44TH STREET, SUITE 650
PHOENIX, AZ 85008

REVISIONS

NO.	BY	DATE	CKD	REMARKS

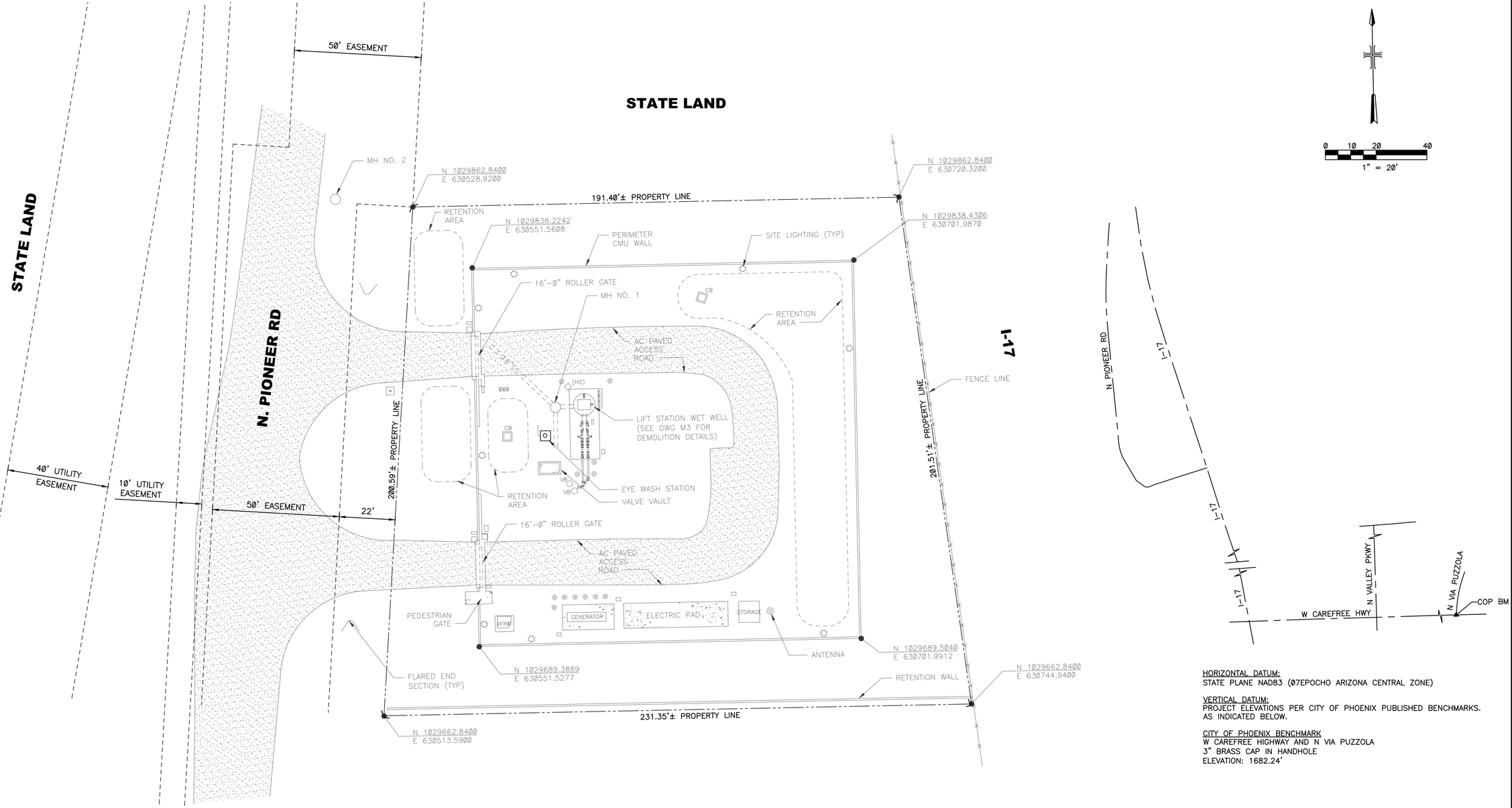
DES MT/RP
DWN RAM
CKD FS

City of Phoenix

CITY OF PHOENIX
WATER SERVICES DEPARTMENT
COLLECTION SYSTEMS
REMOTE FACILITIES

CIVIL
LIFT STATION 76 PHASE II EXPANSION
NOTES AND HYDRAULIC PROFILE

CITY PROJECT NO. WS90400067
DATE: MAY 2023
C02 SHEET 6 OF 41
CAD FILE: 04276.05_C02



HORIZONTAL DATUM:
STATE PLANE NAD83 (07EPOCHO ARIZONA CENTRAL ZONE)

VERTICAL DATUM:
PROJECT ELEVATIONS PER CITY OF PHOENIX PUBLISHED BENCHMARKS. AS INDICATED BELOW.

CITY OF PHOENIX BENCHMARK
W CAREFREE HIGHWAY AND N VIA PUZZOLA
3" BRASS CAP IN HANDHOLE
ELEVATION: 1682.24'

Contact Arizona 811 at least two full working days before you begin excavation

ARIZONA811 BLUE STAKE, INC.

Call 811 or click Arizona811.com

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REVISION	ENGINEERING COMPANY	PROJECT NO.	PROJECT NAME	DATE	CAD FILE NAME	DWG NUMBER	REMARKS

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THIS DOCUMENT MUST BE KEPT SECURE AT ALL TIMES.

Registered Professional Engineer (Civil) CERTIFICATE NO. 41013 FERNANDO SARMIENTO Date Signed ARIZONA, U.S.A.

GREELEY AND HANSEN
2800 N. 44TH STREET, SUITE 650
PHOENIX, AZ 85008

REVISIONS				
NO.	BY	DATE	CKD	REMARKS

DES MT/RP
DWN RAM
CKD FS

City of Phoenix

CITY OF PHOENIX
WATER SERVICES DEPARTMENT
COLLECTION SYSTEMS
REMOTE FACILITIES

CIVIL

LIFT STATION 76 PHASE II EXPANSION
EXISTING SITE PLAN WITH GEOMETRIC CONTROL

CITY PROJECT NO. WS90400067
DATE: MAY 2023
C03 SHEET 7 OF 41
CAD FILE: 04276.05_C03

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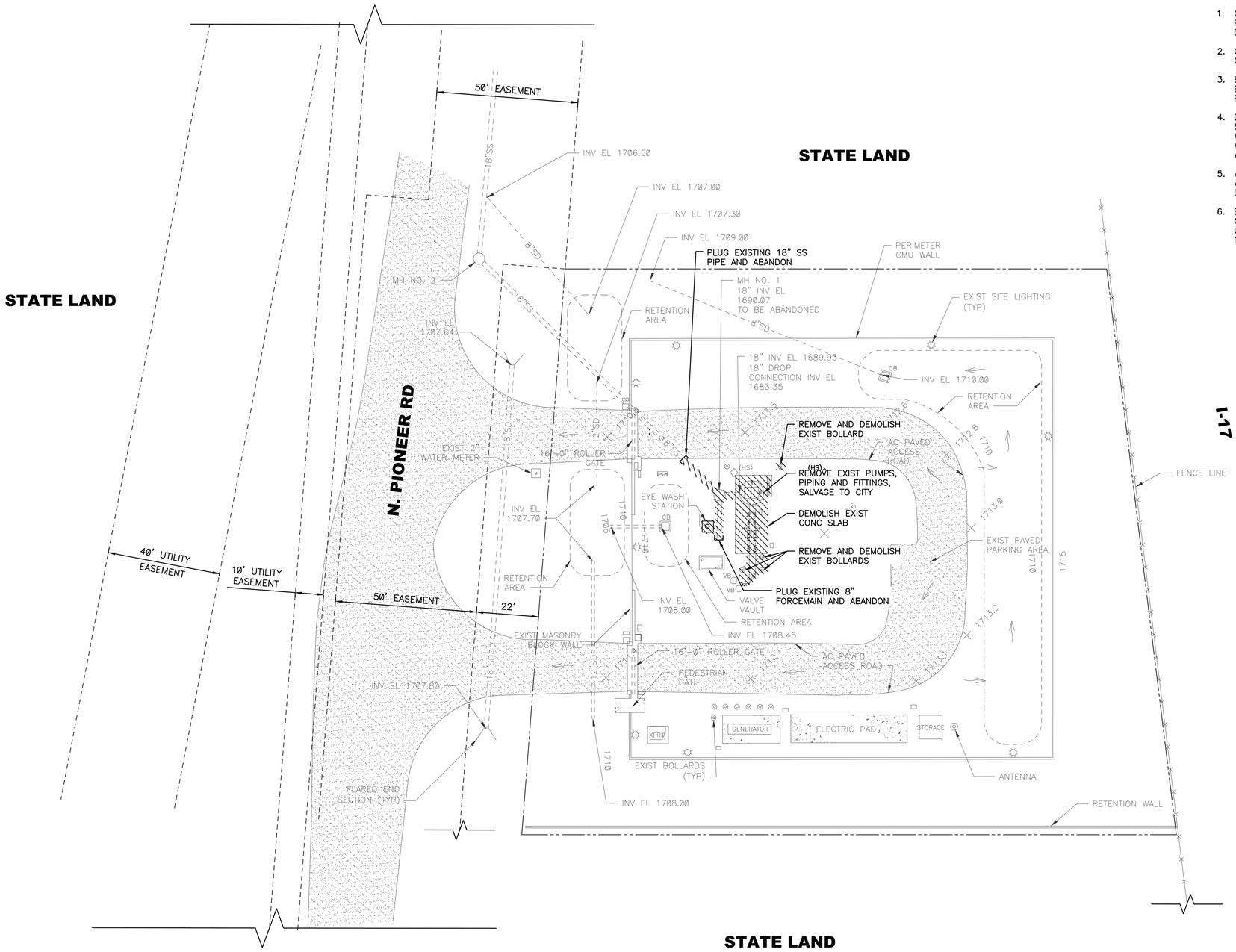

NOTES

1. CONTRACTOR SHALL CAREFULLY REMOVE EXISTING PUMPS, INSTRUMENTATION, PIPING, APPURTENANCES, PIPE STANDS AND AND ANCILLARY EQUIPMENT DURING DEMOLITION SO AS TO NOT DAMAGE EXISTING EQUIPMENT.
2. CONTRACTOR SHALL VERIFY WHICH EQUIPMENT IS TO BE SALVAGED WITH THE CITY FOR STORAGE, PRIOR TO COMMENCING DEMOLITION.
3. EXISTING CONCRETE SLAB AND BOLLARDS SHALL BE REMOVED IN THEIR ENTIRETY AND DISPOSE OF IN ACCORDANCE WITH CITY GUIDELINES AND REQUIREMENTS.
4. DEMOLITION OF EXISTING WET WELL SHALL BE IN ACCORDANCE WITH SPECIFICATIONS CONTRACTOR SHALL REMOVE ALL FLUIDS AND DEBRIS FROM WITHIN THE STRUCTURE. NO STANDING WATER OR DEBRIS SHALL BE ALLOWED WITHIN THE WET INSPECTION OF THE WET WELL INTERIOR SHALL BE COMPLETED AND ACCEPTED PRIOR TO BACKFILLING AND COVERING OF THE WET WELL.
5. AT MINIMUM, THE TOP 7-FEET OF EXISTING UTILITIES AND STRUCTURES THAT ARE TO BE DEMOLISHED WILL BE COMPLETE REMOVED IN THEIR ENTIRETY AND DISPOSED OF IN ACCORDANCE WITH CITY GUIDELINES AND REQUIREMENTS.
6. EXISTING PIPELINES THAT ARE TO BE ABANDONED IN PLACE WILL BE CUT AND COMPLETELY CLEANED OF ALL LIQUIDS AND DEBRIS PRIOR TO SEALING THE UTILITY. PIPELINES SHALL BE CAPPED AT BOTH ENDS WITH MINIMUM OF 12-INCHES OF NON-METALLIC GROUT.

FACILITY DRAWINGS
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FOR CITY OF PHOENIX USE ONLY - REFERENCE CID NUMBER: #

REVISION	ENGINEERING COMPANY	PROJECT NO.	PROJECT NAME	DATE	CAD FILE NAME	DWG NUMBER	REMARKS

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ARIZONA811 BLUE STAKE, INC.
Call 811 or click Arizona811.com

Registered Professional Engineer (Civil) CERTIFICATE NO. 41013 FERNANDO SARMIENTO Date Signed 5/30/2023 ARIZONA, U.S.A.

GREELEY AND HANSEN
2800 N. 44TH STREET, SUITE 650
PHOENIX, AZ 85008

REVISIONS				
NO.	BY	DATE	CKD	REMARKS

DES MT/RP
DWN RAM
CKD FS

City of Phoenix

CITY OF PHOENIX
WATER SERVICES DEPARTMENT
COLLECTION SYSTEMS
REMOTE FACILITIES

CIVIL

LIFT STATION 76 PHASE II EXPANSION
DEMOLITION PLAN

CITY PROJECT NO. WS90400067
DATE: MAY 2023
C04 SHEET 8 OF 41
CAD FILE: 04276.05_C04

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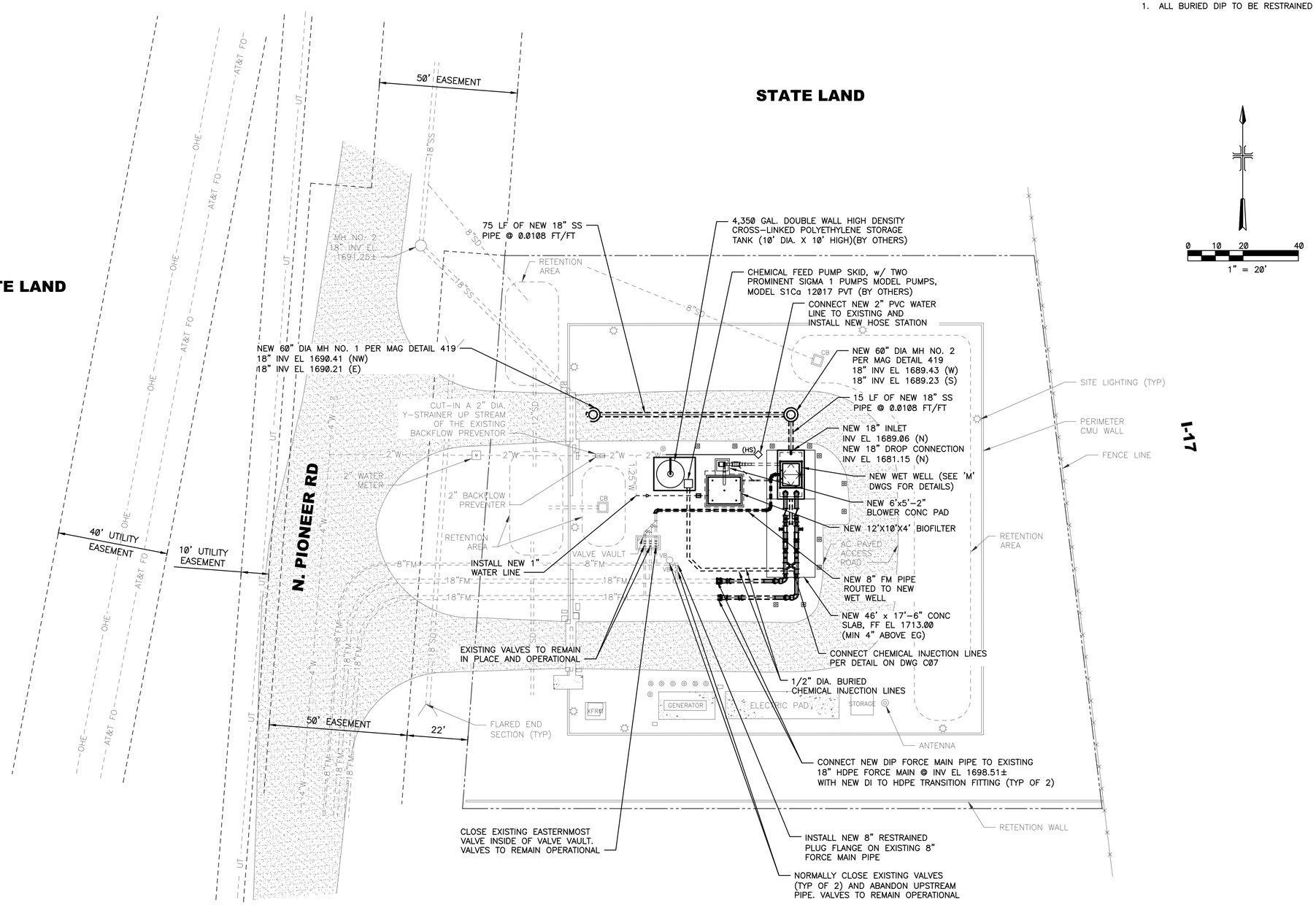
NOTES

1. ALL BURIED DIP TO BE RESTRAINED PER SPECIFICATIONS.



1-17

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REVISION	ENGINEERING COMPANY	PROJECT NO.	PROJECT NAME	DATE	CAD FILE NAME	DWG NUMBER	REMARKS
						1 - 1 - 1	1 - 1 - 1

Registered Professional Engineer (Civil)
CERTIFICATE NO.
41013
FERNANDO SARMIENTO
Date Signed
ARIZONA, U.S.A.

GREELEY AND HANSEN
2800 N. 44TH STREET, SUITE 650
PHOENIX, AZ 85008

REVISIONS					DES	DWN	CKD
NO.	BY	DATE	CKD	REMARKS	MT/RP	RAM	FS

City of Phoenix

CITY OF PHOENIX
WATER SERVICES DEPARTMENT
COLLECTION SYSTEMS
REMOTE FACILITIES

CIVIL

LIFT STATION 76 PHASE II EXPANSION
NEW YARD PIPING PLAN

CITY PROJECT NO. WS90400067

DATE: MAY 2023

C05 SHEET 9 OF 41

CAD FILE: 04276.05_C05

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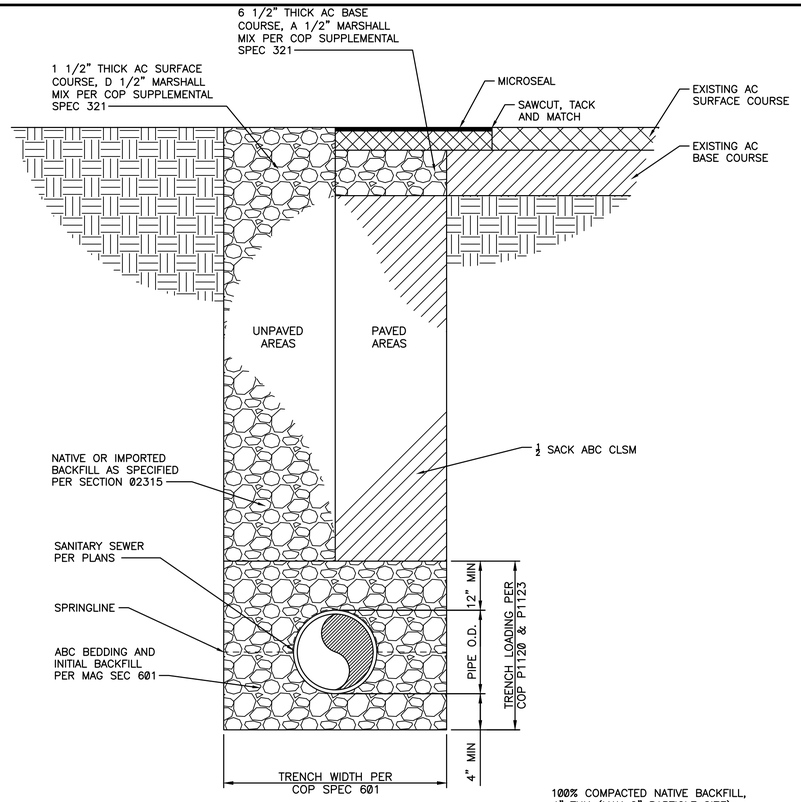
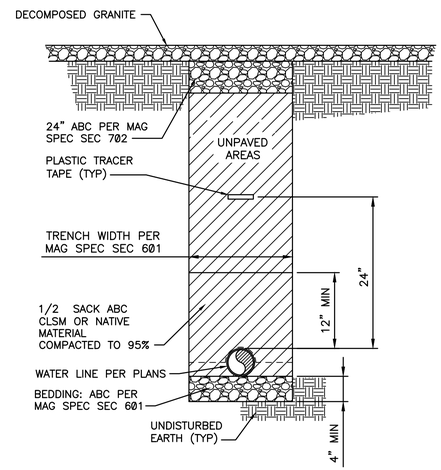


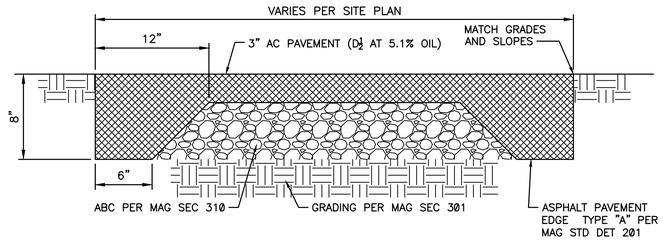
TYPICAL VCP TRENCH DETAIL

SCALE: NTS



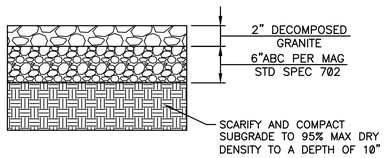
TYPICAL WATERLINE TRENCH DETAIL

SCALE: NTS



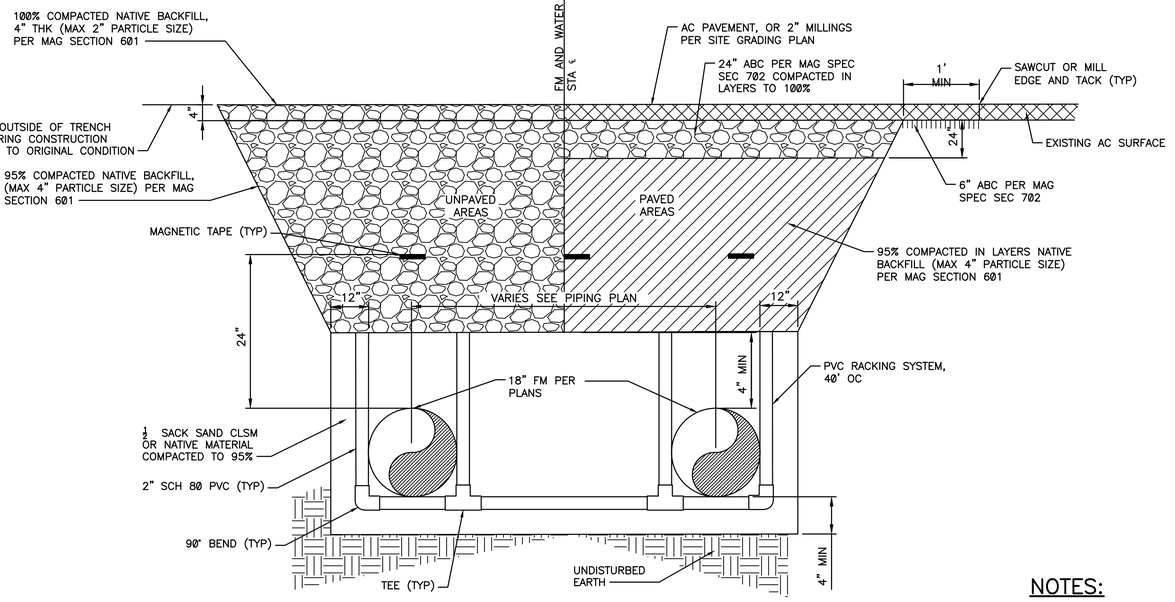
TYPICAL ASPHALT PAVEMENT DETAIL

SCALE: NTS



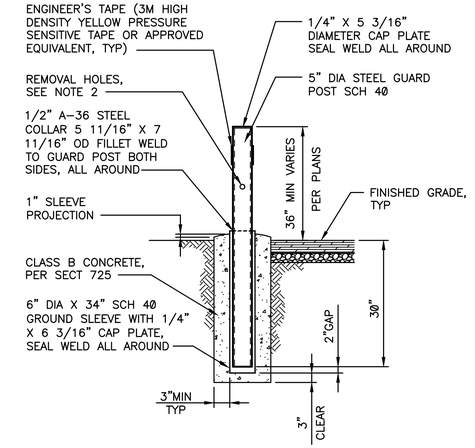
DECOMPOSED GRANITE STRUCTURAL DETAIL

SCALE: NTS



TYPICAL FORCEMAIN TRENCH DETAIL

SCALE: NTS



GUARD POST DETAIL

(TYPE 2 REMOVABLE)
NOT TO SCALE

NOTES

1. WHERE AC PAVEMENT ENDS ADJACENT TO UNPAVED AREAS, CONTRACTOR SHALL PROVIDE ASPHALT PAVEMENT EDGE IN ACCORDANCE WITH MAG STD DETAIL NO. 201 TYPE "A".
2. TRENCH IN PAVEMENT MUST BE T-TOP WITH 1/2 SACK CLSM PER MAG STANDARD DETAILS 200 AND 212, MAG SPECIFICATIONS 604, 728, AND MCDOT SUPPLEMENTS TO MAG SECTION 601.
3. OUTSIDE OF TRENCH AREA PROVIDE 2.5" AC OVER 6" ABC.
4. FOR MILLINGS OUTSIDE OF TRENCH AREA SEE DECOMPOSED GRANITE STRUCTURAL SECTION.

NOTES:

1. REMOVABLE POSTS SHALL HAVE 1" DIA HOLES DRILLED THROUGH AT A DISTANCE 1/3 THE OVERALL POST LENGTH FROM THE TOP.
2. REMOVABLE POST – GRIND SMOOTH ALL SHARP EDGES PRIOR TO GALVANIZATION. GALVANIZE PER ASTM A54 AFTER FABRICATION.

FACILITY DRAWINGS
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FOR CITY OF PHOENIX USE ONLY – REFERENCE CID NUMBER: #

REVISION	ENGINEERING COMPANY	PROJECT NO.	PROJECT NAME	DATE	CAD FILE NAME	DWG NUMBER	REMARKS

Registered Professional Engineer (Civil) CERTIFICATE NO. 41013 FERNANDO SARMIENTO Date Signed 6/30/2023 ARIZONA, U.S.A.
GREELEY AND HANSEN
2800 N. 44TH STREET, SUITE 650
PHOENIX, AZ 85008

REVISIONS				
NO.	BY	DATE	CKD	REMARKS

DES MT/RP
DWN RAM
CKD FS

City of Phoenix

CITY OF PHOENIX
WATER SERVICES DEPARTMENT
COLLECTION SYSTEMS
REMOTE FACILITIES

CIVIL

LIFT STATION 76 PHASE II EXPANSION
DETAILS 1

CITY PROJECT NO. WS90400067
DATE: MAY 2023
C06 SHEET 10 OF 41
CAD FILE: 04276.05_C06

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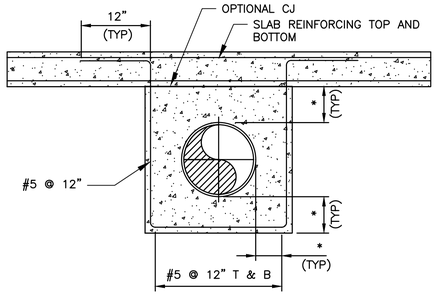


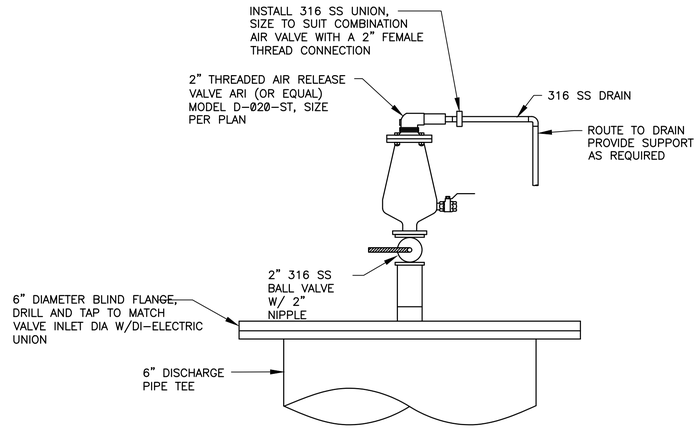
*4" MIN FOR ALL 3" AND SMALLER DIA OD PIPE
6" MIN FOR ALL 4" TO 9" DIA OD PIPE
12" MIN FOR ALL 10" TO 23" DIA OD PIPE
16" MIN FOR ALL 24" AND LARGER DIA OD PIPE

NOTES:

1. PROVIDE SOLID CONCRETE BLOCK UNDER PIPE FOR SUPPORT (NOT SHOWN FOR CLARITY).
2. PROVIDE PIPE JOINT WITHIN 12" OF ENDING CONCRETE ENCASEMENT.

UNDER SLAB PIPE AND CONDUIT ENCASEMENT DETAIL

SCALE: NTS

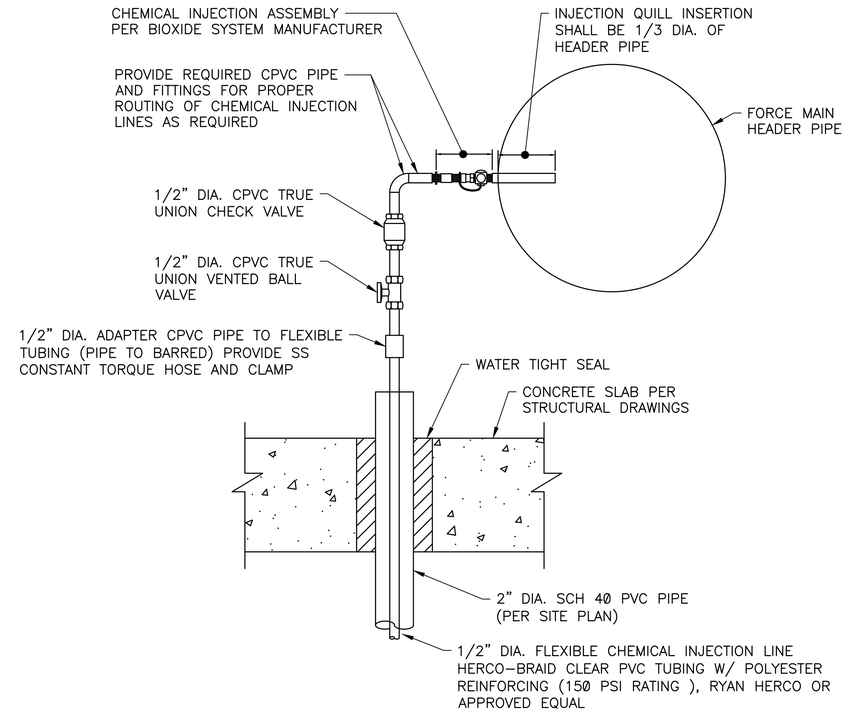


NOTES:

1. ALL BLOWOFF PIPING FOR ABOVE GROUND AIR RELEASE VALVE SHALL BE CPVC.
2. PROVIDE ADEQUATE LENGTH FOR VALVE HANDLE TO CLEAR PIPE.

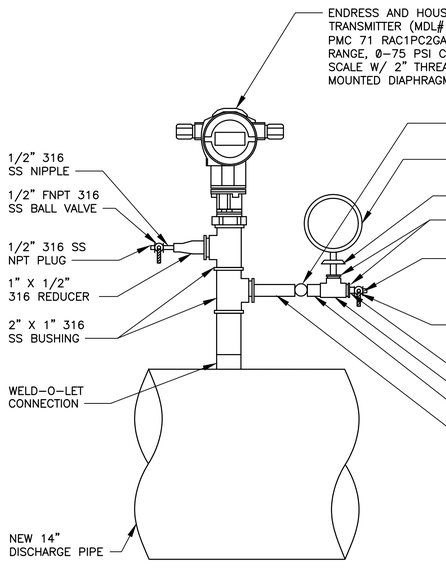
AIR/VACUUM RELEASE VALVE DETAIL

SCALE: NTS



CHEMICAL INJECTION ASSEMBLY DETAIL

SCALE: NTS



TRANSMITTER W/ MOUNTING DETAIL

SCALE: NTS

ALUMINUM:

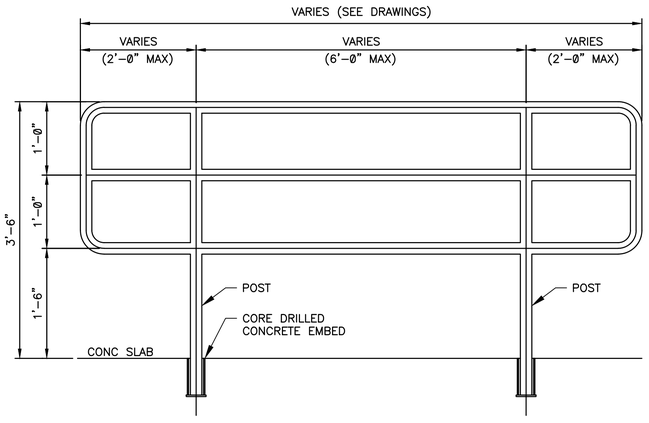
1. ALUMINUM CONSTRUCTION SHALL CONFORM TO THE LATEST EDITION OF THE ALUMINUM CONSTRUCTION MANUAL OF THE ALUMINUM ASSOCIATION.
2. UNLESS OTHERWISE INDICATED, STRUCTURAL ALUMINUM SHALL BE ALLOY 6061-T6 OR ALLOY 6063-T6, ANODIZED, CONFORMING TO ASTM B221. CHECKERED PLATE SHALL CONFORM TO ASTM B209.
3. WHERE ALUMINUM IS IN CONTACT WITH CONCRETE SURFACES, CONTACT SURFACES SHALL BE COATED WITH ONE HEAVY COAT OF ALKALI RESISTANT BITUMINOUS PAINT MEETING THE REQUIREMENTS OF BUREAU OF RECLAMATION SPECIFICATION CTP-1.
4. USE 2" SCHEDULE 40 ALUMINUM PIPE FOR RAILS AND 2" SCHEDULE 80 ALUMINUM PIPE FOR UPRIGHTS.

DEFERRED SUBMITTALS:

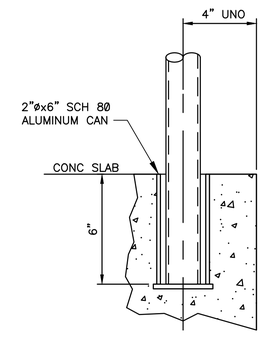
1. THE FOLLOWING ITEM REQUIRES DEFERRED SUBMITTAL:
   A) RAILING AND RAILING ANCHORAGE DESIGN FOR ALL LIFT STATIONS APPLICABLE.
2. THIS ITEM SHALL BE DESIGNED AND MANUFACTURED BY AN APPROVED FABRICATOR. DESIGN AND FABRICATION SHALL BE IN ACCORDANCE WITH THE CODES AND STANDARDS CITED IN THESE GENERAL STRUCTURAL NOTES, DRAWINGS, AND/OR SPECIFICATIONS. CONTRACTOR SHALL SUBMIT CALCULATIONS, DRAWINGS, AND MANUFACTURER'S DATA SUFFICIENT TO DEMONSTRATE COMPLIANCE TO THE ENGINEER FOR REVIEW.

CODES AND STANDARDS:

1. THE INTERNATIONAL BUILDING CODE, 2018 EDITION (IBC), INCLUDING OTHER CODES AND STANDARDS REFERENCED THEREIN, PROVIDES MINIMUM REQUIREMENTS, IN ADDITION, OTHER CODES AND STANDARDS REFERENCED IN THESE DRAWINGS APPLY TO THE SPECIFIED PARTS OF THE WORK.
2. AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE), ASCE 7-16 (2016), "MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES".
3. ALUMINUM ASSOCIATION (AA) 2010, "ALUMINUM DESIGN MANUAL".



ELEVATION - REMOVABLE HANDRAIL



EMBEDDED SLEEVE

REMOVABLE HANDRAIL DETAIL

SCALE: NTS

FACILITY DRAWINGS
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FOR CITY OF PHOENIX USE ONLY - REFERENCE CID NUMBER: #

REVISION	ENGINEERING COMPANY	PROJECT NO.	PROJECT NAME	DATE	CAD FILE NAME	DWG NUMBER	REMARKS

Registered Professional Engineer (Civil)
CERTIFICATE NO.
41013
FERNANDO SARMIENTO
Date Signed
ARIZONA, U.S.A.

GREELEY AND HANSEN
2800 N. 44TH STREET, SUITE 650
PHOENIX, AZ 85008

REVISIONS				
NO.	BY	DATE	CKD	REMARKS

DES MT/RP
DWN RAM
CKD FS

City of Phoenix

CITY OF PHOENIX
WATER SERVICES DEPARTMENT
COLLECTION SYSTEMS
REMOTE FACILITIES

CIVIL

LIFT STATION 76 PHASE II EXPANSION
DETAILS 2

CITY PROJECT NO. WS90400067
DATE: MAY 2023
C07 SHEET 11 OF 41
CAD FILE: 04276.05_C07

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PIPE FITTING SYMBOLS

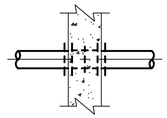
DOUBLE LINE | SINGLE LINE

EXISTING PIPE

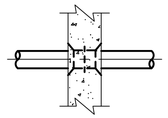
EXISTING PIPE TO BE REMOVED

NEW PIPE

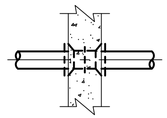
WALL PIPE FITTINGS



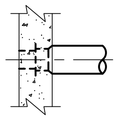
FLANGED JOINT ENDS



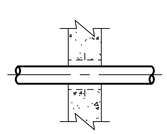
BELL AND SPIGOT JOINT ENDS



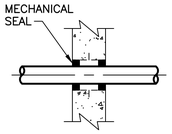
MECHANICAL JOINT ENDS



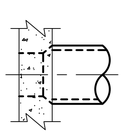
PLAIN END x BELL AND SPIGOT JOINT END



WALL SLEEVE (DRY CONDITION)



WALL SLEEVE (WET CONDITION)



PLAIN END x RCP BELL

PROCESS FLOW DIAGRAM SYMBOLS

VALVE SYMBOLS

3-WAY VALVE

4-WAY VALVES

BACKFLOW PREVENTER

BACKPRESSURE REGULATOR SELF CONTAINED

BALL CHECK VALVE

BALL VALVE

BUTTERFLY VALVE

DIAPHRAGM SEAL

DIAPHRAGM VALVE

FLAPPER CHECK VALVE

FLOW STRAIGHTENER

GATE VALVE

GLOBE VALVE

KNIFE VALVE

NEEDLE VALVE

PETCOCK

PINCH VALVE

PLUG VALVE

PRESSURE REGULATING VALVE SELF CONTAINED

PRESSURE RELIEF VALVE

RUPTURE DISK (PRESSURE RELIEF)

RUPTURE DISK (VACUUM RELIEF)

SWING CHECK VALVE

TELESCOPING VALVE

VACUUM RELIEF VALVE

VEE BALL VALVE

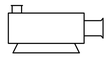
PUMP / EQUIPMENT SYMBOLS

CENTRIFUGAL PUMP

DIAPHRAGM PUMP

METERING, PERISTALTIC, OR PROPORTIONING PUMP

PISTON PUMP

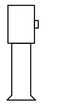


PROGRESSIVE CAVITY PUMP

ROTARY PUMP

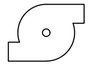
SCREW (LIFT) PUMP POSITIVE DISPLACEMENT

SUBMERSIBLE SUMP PUMP



VERTICAL TURBINE PUMP

BLOWER



COMPRESSOR

CHLORINATOR

EVAPORATOR

SLIDE GATE

SLUICE GATE

STOP LOG/PLATE GROOVES

INSERT MAGNETIC FLOW ELEMENT

INLINE MAGNETIC FLOW ELEMENT

DENSITY FLOW ELEMENT

ROTOMETER TYPE FLOW ELEMENT

VENTURI TYPE FLOW ELEMENT

DIFFUSER

STATIC MIXER

MIXER

STRAINER

DAMPER

FLEX HOSE

HOSE BIBB

YARD HYDRANT

HIGH PRESSURE AIR HOSE STATION

DRAIN

FACILITY DRAWINGS

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REVISION	ENGINEERING COMPANY	PROJECT NO.	PROJECT NAME	DATE	CAD FILE NAME	DWG NUMBER	REMARKS

Contact Arizona 811 at least two full working days before you begin excavation

ARIZONA811 BLUE STAKE, INC.

Call 811 or click Arizona811.com

Registered Professional Engineer (Civil) CERTIFICATE NO. 41013 FERNANDO SARMIENTO Date Signed ARIZONA, U.S.A.

GREELEY AND HANSEN

2800 N. 44TH STREET, SUITE 650
PHOENIX, AZ 85008

REVISIONS				
NO.	BY	DATE	CKD	REMARKS

DES MT/RP

DWN RAM

CKD FS

City of Phoenix

CITY OF PHOENIX
WATER SERVICES DEPARTMENT
COLLECTION SYSTEMS

REMOTE FACILITIES

MECHANICAL PROCESS

LIFT STATION 76 PHASE II EXPANSION
LEGEND 1

CITY PROJECT NO. WS90400067

DATE: MAY 2023

M01 SHEET 12 OF 41

CAD FILE: 04276.05_M01

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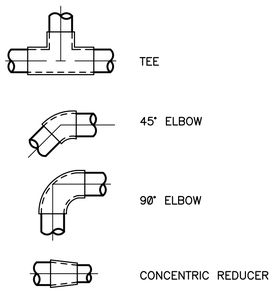
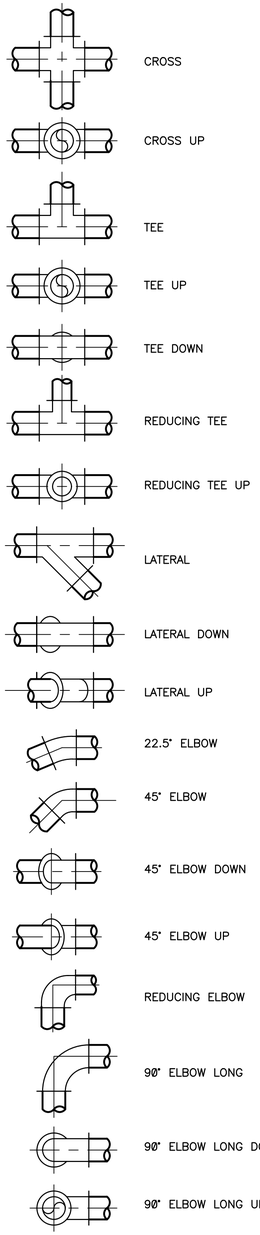
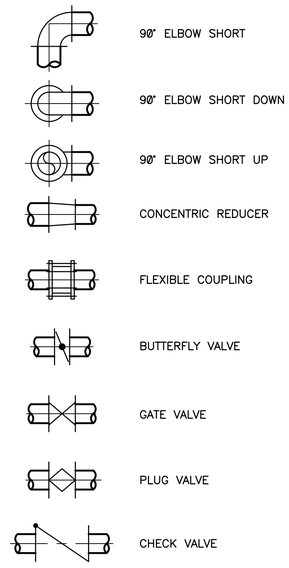
CONCRETE FITTINGS

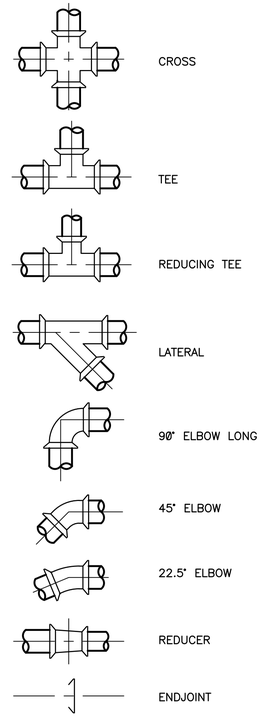


FLANGED FITTINGS

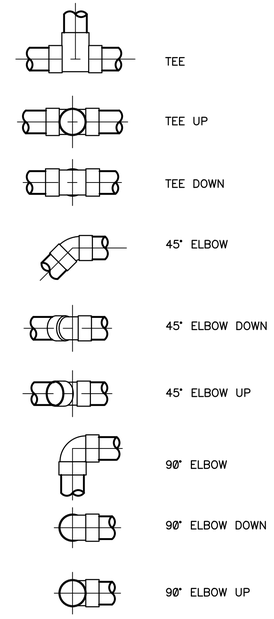




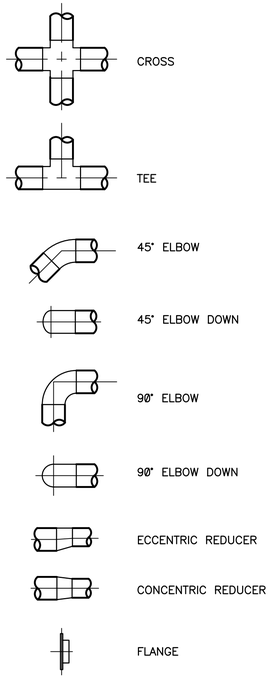
MECHANICAL JOINT FITTINGS



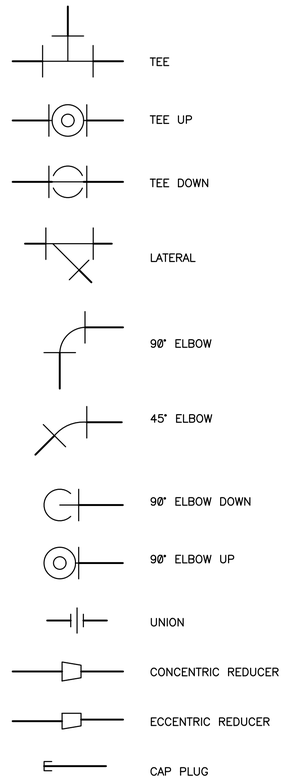
PVC FITTINGS



STEEL FITTINGS



SINGLE LINE FITTINGS



FACILITY DRAWINGS
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FOR CITY OF PHOENIX USE ONLY - REFERENCE CID NUMBER: #

REVISION	ENGINEERING COMPANY	PROJECT NO.	PROJECT NAME	DATE	CAD FILE NAME	REMARKS	DWG NUMBER

Contact Arizona 811 at least two full working days before you begin excavation
ARIZONA811 BLUE STAKE, INC.
Call 811 or click Arizona811.com

Registered Professional Engineer (Civil) CERTIFICATE NO. 41013 FERNANDO SARMIENTO Date Signed 5/30/23 ARIZONA, U.S.A.

GREELEY AND HANSEN
2800 N. 44TH STREET, SUITE 650
PHOENIX, AZ 85008

REVISIONS				
NO.	BY	DATE	CKD	REMARKS

DES MT/RP
DWN RAM
CKD FS

City of Phoenix

CITY OF PHOENIX
WATER SERVICES DEPARTMENT
COLLECTION SYSTEMS
REMOTE FACILITIES

MECHANICAL PROCESS

LIFT STATION 76 PHASE II EXPANSION
LEGEND 2

CITY PROJECT NO. WS90400067
DATE: MAY 2023
M02 SHEET 13 OF 41
CAD FILE: 04276.05_M02

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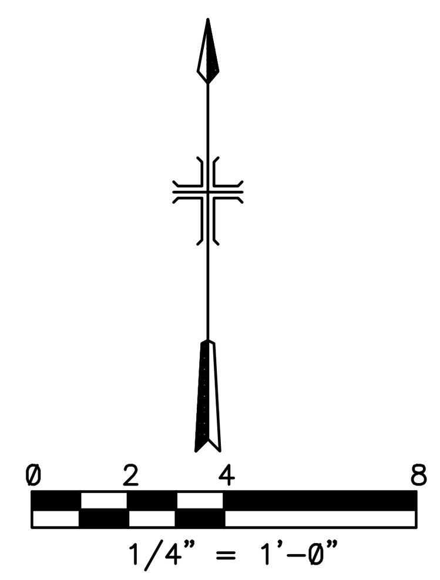
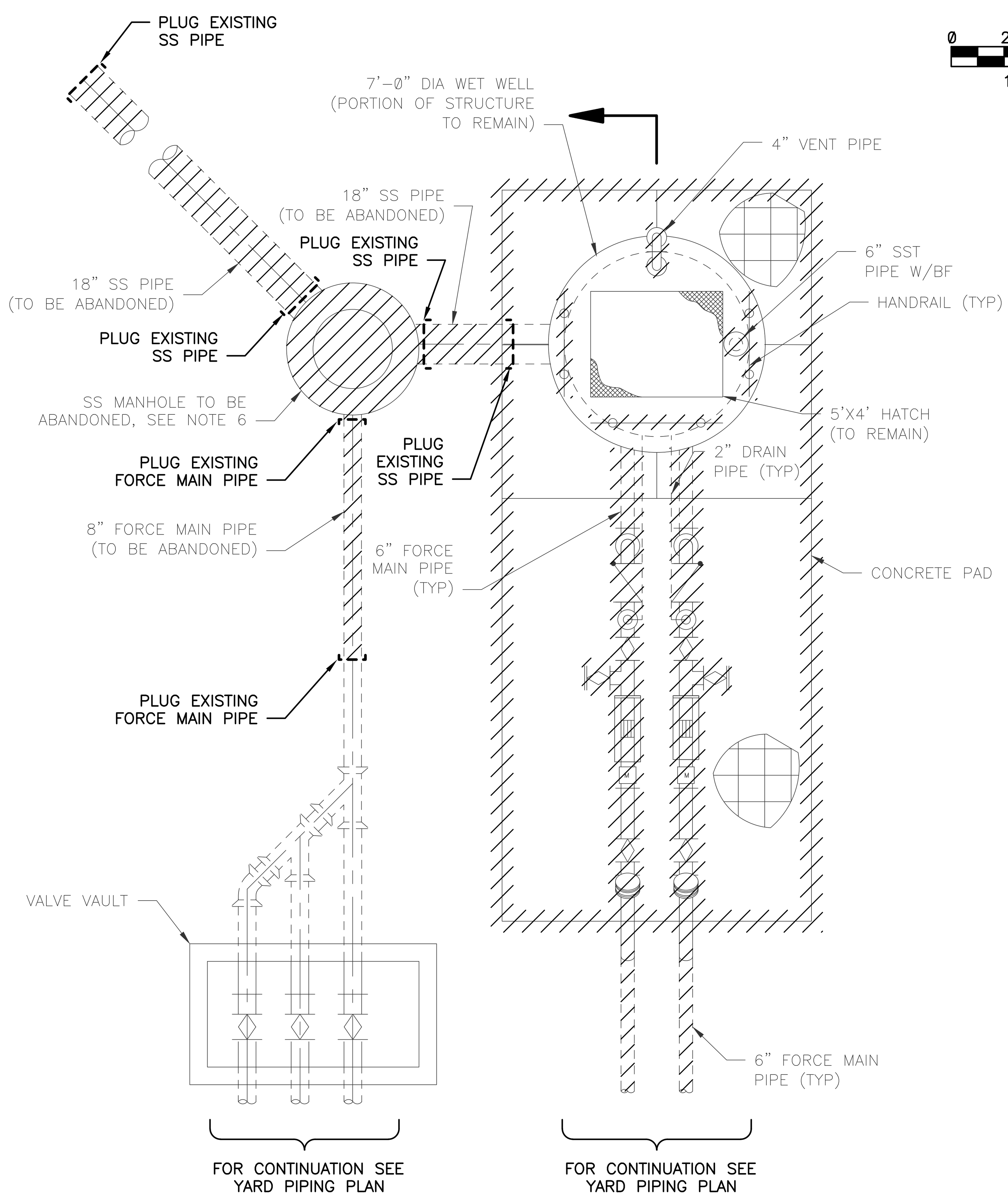
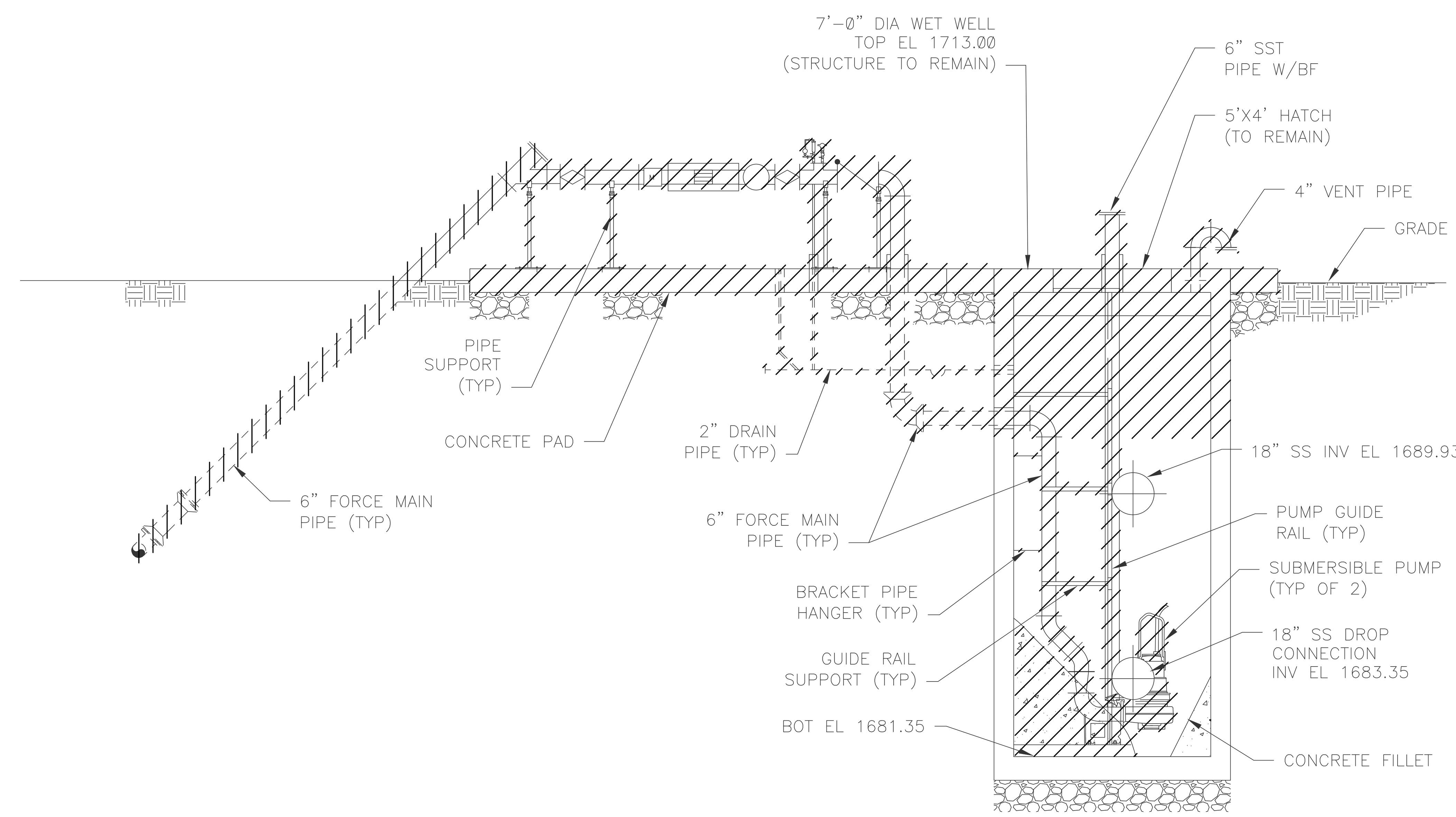
NOTES:

1. CONTRACTOR SHALL BACKFILL WET WELL AND MANHOLE WITH A 26 PCF MIXTURE, WITH A MINIMUM AVERAGE COMPRESSIVE STRENGTH OF 60 PSI.
2. CONTRACTOR SHALL USE ONE-HALF SACK CONTROLLED LOW STRENGTH MATERIAL (LSM) PER CITY OF PHOENIX SUPPLEMENT TO MAG STANDARD SPECIFICATIONS AND DETAILS (MOST RECENT EDITION), SECTION 604.
3. CONTRACTOR IS RESPONSIBLE TO BACKFILL THE WET WELL AND MANHOLE COMPLETELY AS DESCRIBED WITHOUT ANY CAVITIES OR VOIDS.
4. PER CITY OF PHOENIX ORDINANCE G-4396, THESE PLANS ARE FOR OFFICIAL USE ONLY AND MAY NOT BE SHARED WITH OTHERS EXPECT AS REQUIRED FOR THE CONSTRUCTION OF THE PUBLIC WORKS FACILITIES SHOWN HEREON. THE PROJECT OWNER, AND THE OWNER'S LENDERS, CONSULTANTS, CONTRACTORS AND SUBCONTRACTORS ARE PROHIBITED FROM DISCLOSING THE PLANS AND SPECIFICATIONS TO ANY PERSONS OTHER THAN THOSE WHO HAVE A NEED TO KNOW THE INFORMATION FOR THE PURPOSE OF THE PROJECT.
5. EXISTING WET WELL BOTTOM IS TO BE CORE DRILLED BEFORE BACKFILLING. WET WELL SHALL BE ABANDONED IN PLACE WITH CONTROLLED LOW STRENGTH MATERIAL (LSM) IN ACCORDANCE WITH THE MOST RECENT EDITION OF THE MAG STANDARD SPECIFICATIONS AND DETAILS FOR PUBLIC WORKS CONSTRUCTION, SECTION 604. LOW STRENGTH FLOWABLE FILL DEPTH SHALL NOT BE GREATER THAN 5-FEET BELOW GRADE. THE REMAINING VOLUME SHALL BE BACKFILLED WITH GENERAL FILL MATERIAL TO 95% COMPACTION. GENERAL BACKFILL SHALL MATCH GRADING PLAN.
6. EXISTING MANHOLE NO. 1 IS TO BE CORE DRILLED BEFORE BACKFILLING.THE CONTRACTOR SHALL REMOVE THE COVER AND FRAME, AND SHALL REMOVE THE TOP 6-FT BELOW GRADE OF THE MANHOLE. THE MANHOLE IS TO BE ABANDONED IN PLACE WITH CONTROLLED LOW STRENGTH MATERIAL (LSM) IN ACCORDANCE WITH THE MOST RECENT EDITION OF THE MAG STANDARD SPECIFICATIONS AND DETAILS FOR PUBLIC WORKS CONSTRUCTION, SECTION 604. LOW STRENGTH FLOWABLE FILL DEPTH SHALL NOT BE GREATER THAN 5-FEET BELOW GRADE. THE REMAINING VOLUME SHALL BE BACKFILLED WITH GENERAL FILL MATERIAL TO 95% COMPACTION. GENERAL BACKFILL SHALL MATCH GRADING PLAN.

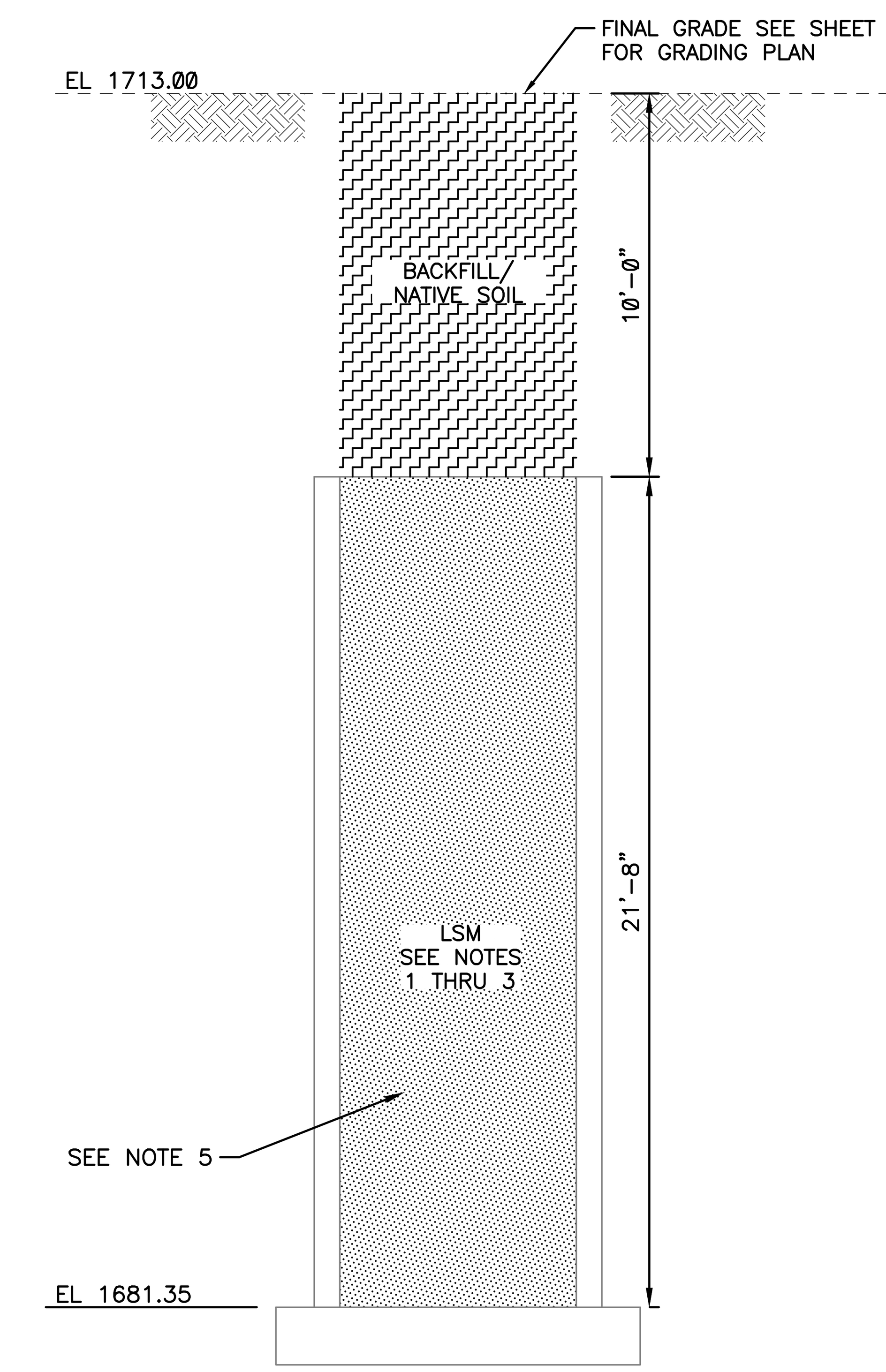




LIFT STATION TOP PLAN
SCALE: 1/4" = 1'-0"



SECTION 1 (M3 M3)
SCALE: 1/4" = 1'-0"



ABANDON WET WELL IN PLACE
SECTION & DETAIL

Contact Arizona 811 at least two full working days before you begin excavation
ARIZONA811
Call 811 or click Arizona811.com

FACILITY DRAWINGS
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FOR CITY OF PHOENIX USE ONLY - REFERENCE CID NUMBER: #

REVISION	ENGINEERING COMPANY	PROJECT NO.	PROJECT NAME	DATE	CAD FILE NAME	DWG NUMBER	REMARKS

Registered Professional Engineer (Civil) CERTIFICATE NO. 41013 FERNANDO SARMIENTO Date Signed ARIZONA, U.S.A.

GREELEY AND HANSEN
2800 N. 44TH STREET, SUITE 650
PHOENIX, AZ 85008

REVISIONS

NO.	BY	DATE	CKD	REMARKS

DES MT/RP
DWN RAM
CKD FS

City of Phoenix

CITY OF PHOENIX
WATER SERVICES DEPARTMENT
COLLECTION SYSTEMS
REMOTE FACILITIES

MECHANICAL PROCESS
LIFT STATION 76 PHASE II EXPANSION
EXISTING LIFT STATION DEMOLITION PLAN & SECTION

CITY PROJECT NO. WS90400067
DATE: MAY 2023
M03 SHEET 14 OF 41
CAD FILE: 04276.05_M03

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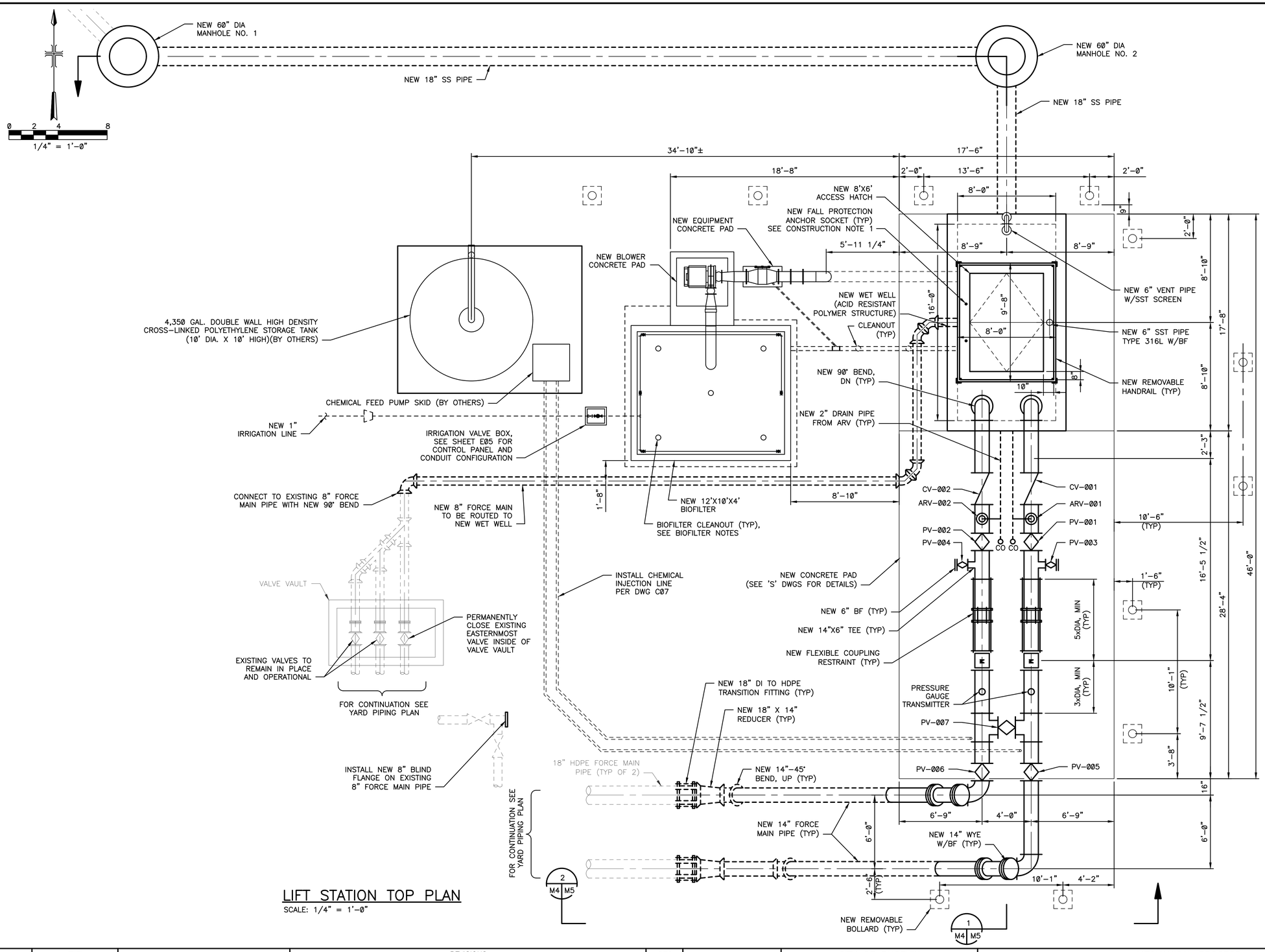

LIFT STATION TOP PLAN

SCALE: 1/4" = 1'-0"

CONSTRUCTION NOTES

1. INSTALL STAINLESS STEEL ADHESIVE MOUNT ANCHOR FALL PROTECTION SOCKET BY 3M DBI/SALA OR APPROVED EQUAL.
2. ALL BURIED DIP TO BE RESTRAINED PER SPECIFICATIONS.

BIOFILTER NOTES

1. LOCATION OF CLEANOUTS FOR THE BIOFILTER WILL BE FIELD VERIFIED BY THE CONTRACTOR IN FULL COORDINATION WITH THE CITY OF PHOENIX.
2. BIOFILTER CLEANOUTS SHALL BE INSTALLED USING THE LATEST APPROVED STANDARDS BY THE CITY AND IN STRICT CONFORMANCE WITH THE CITY'S DIRECTION.

Contact Arizona 811 at least two full working days before you begin excavation
ARIZONA811 BLUE STAKE, INC.
Call 811 or click Arizona811.com

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REVISION	ENGINEERING COMPANY	PROJECT NO.	PROJECT NAME	DATE	CAD FILE NAME	DWG NUMBER	REMARKS

Registered Professional Engineer (Civil) CERTIFICATE NO. 41013 FERNANDO SARMIENTO Date Signed ARIZONA, U.S.A.

GREELEY AND HANSEN
2800 N. 44TH STREET, SUITE 650
PHOENIX, AZ 85008

REVISIONS				
NO.	BY	DATE	CKD	REMARKS

DES MT/RP
DWN RAM
CKD FS

City of Phoenix

CITY OF PHOENIX
WATER SERVICES DEPARTMENT
COLLECTION SYSTEMS
REMOTE FACILITIES

MECHANICAL PROCESS

LIFT STATION 76 PHASE II EXPANSION
NEW LIFT STATION PLAN

CITY PROJECT NO. WS90400067
DATE: MAY 2023
M04 SHEET 15 OF 41
CAD FILE: 04276.05_M04

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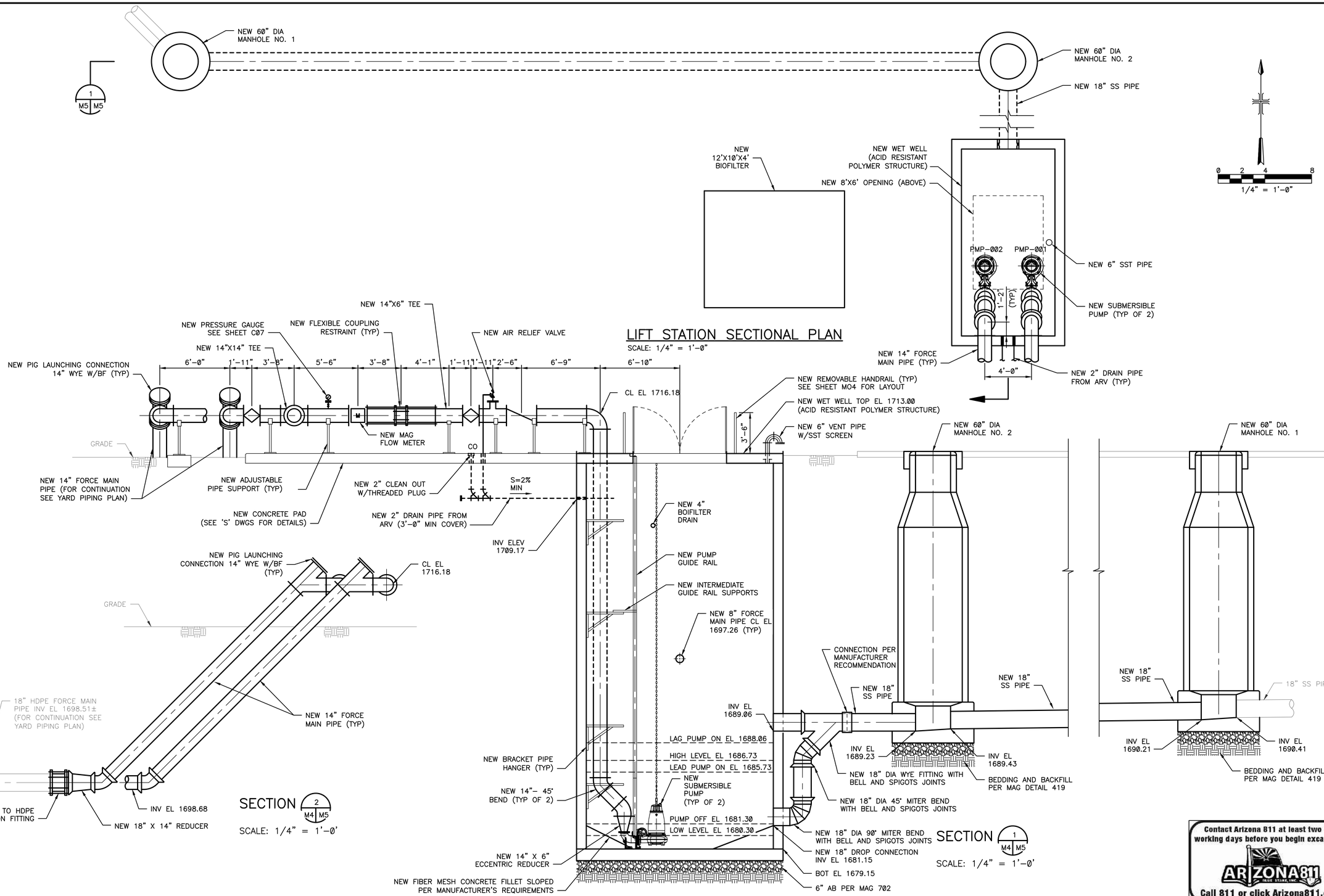

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Registered Professional Engineer (Civil)
CERTIFICATE NO. 41013
FERNANDO SARMIENTO
Date Signed
ARIZONA, U.S.A.

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2800 N. 44TH STREET, SUITE 650
PHOENIX, AZ 85008

REVISIONS				
NO.	BY	DATE	CKD	REMARKS

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CKD FS

City of Phoenix
CITY OF PHOENIX
WATER SERVICES DEPARTMENT
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REMOTE FACILITIES

MECHANICAL PROCESS

LIFT STATION 76 PHASE II EXPANSION
NEW LIFT STATION PLAN & SECTION

CITY PROJECT NO. WS90400067
DATE: MAY 2023
M05 SHEET 16 OF 41
CAD FILE: 04276.05_M05

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100% SUBMITTAL

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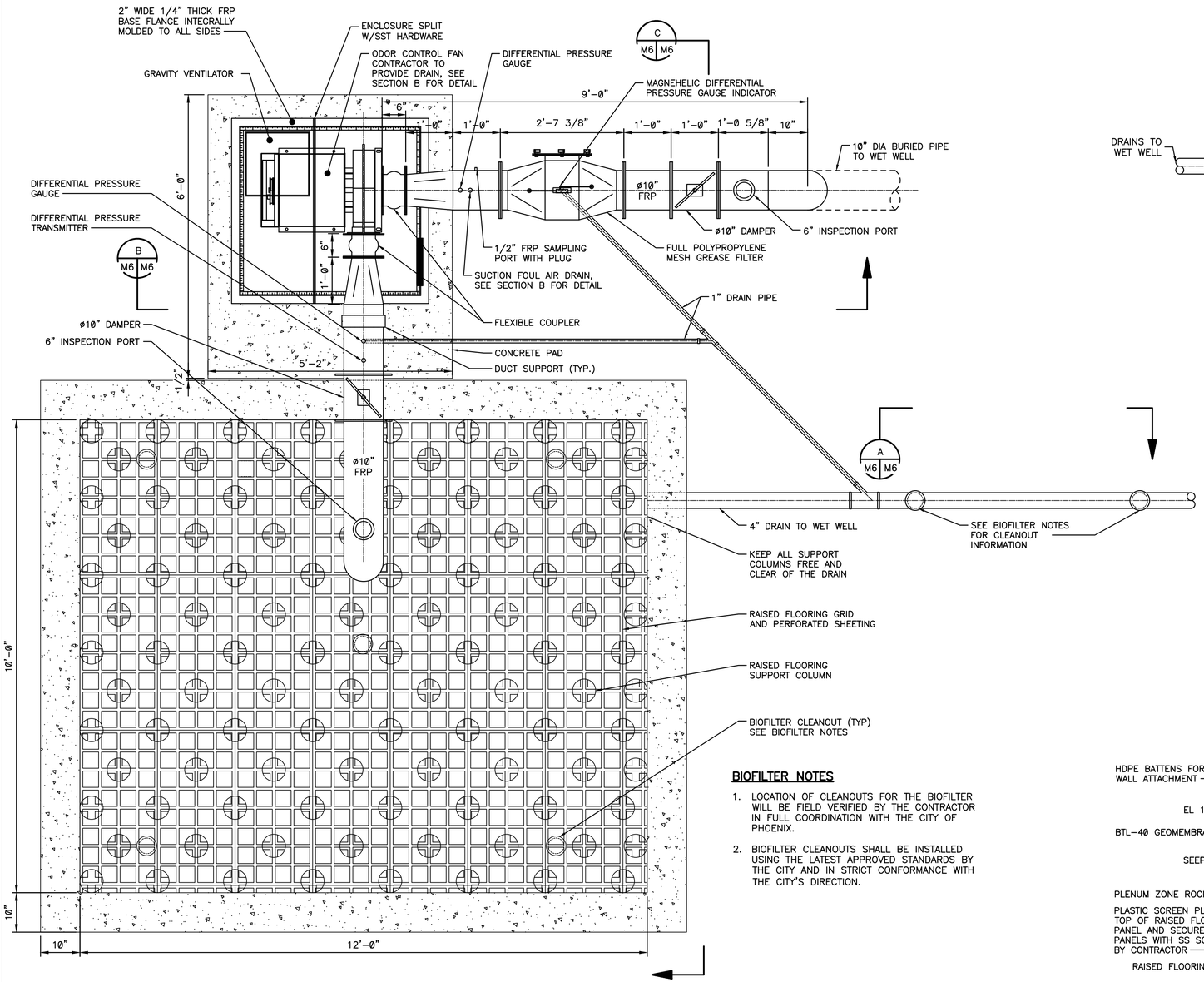
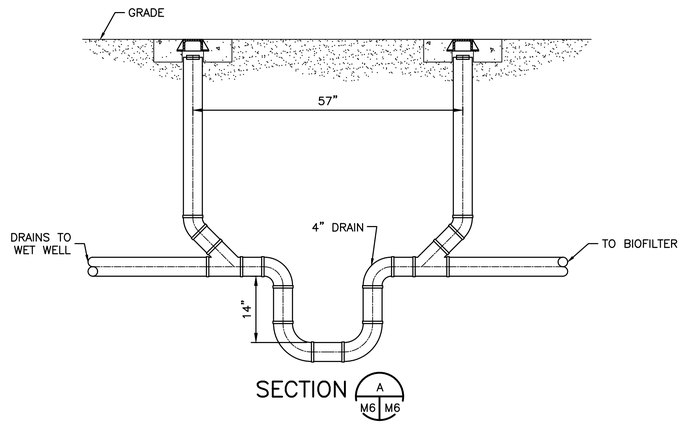


BIOFILTER PLAN VIEW

SCALE: 3/4" = 1'-0"

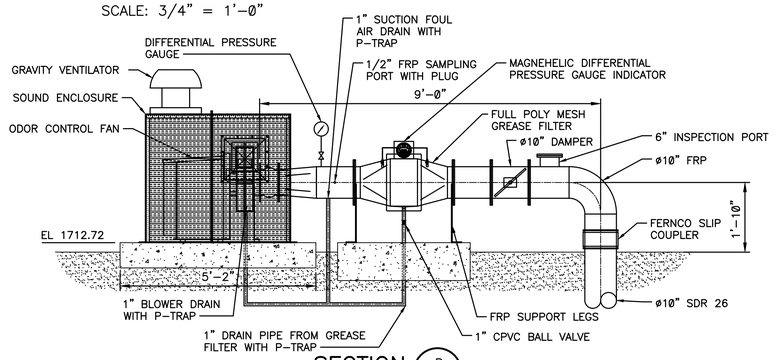
BIOFILTER NOTES

1. LOCATION OF CLEANOUTS FOR THE BIOFILTER WILL BE FIELD VERIFIED BY THE CONTRACTOR IN FULL COORDINATION WITH THE CITY OF PHOENIX.
2. BIOFILTER CLEANOUTS SHALL BE INSTALLED USING THE LATEST APPROVED STANDARDS BY THE CITY AND IN STRICT CONFORMANCE WITH THE CITY'S DIRECTION.



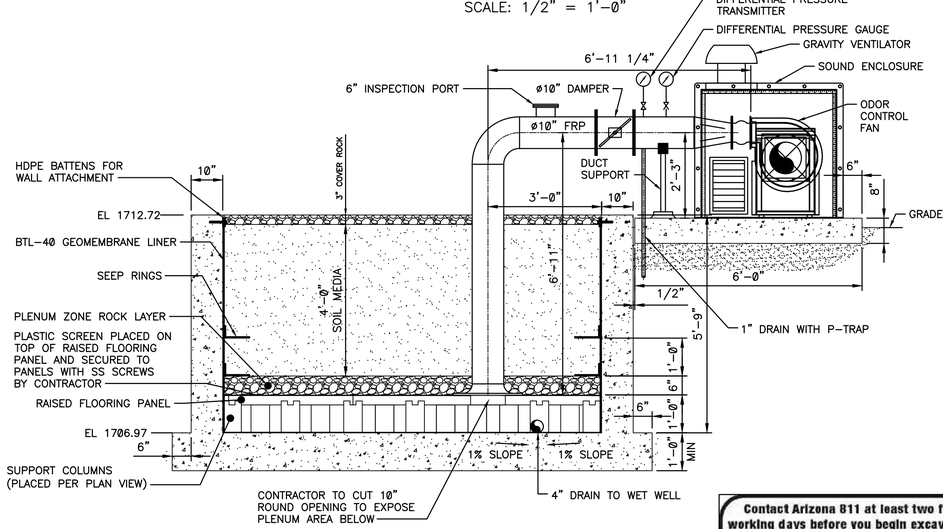
SECTION A M6 M6

SCALE: 3/4" = 1'-0"



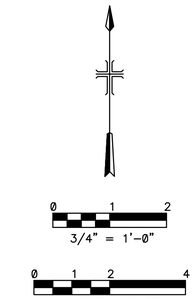
SECTION B M6 M6

SCALE: 1/2" = 1'-0"



SECTION C M6 M6

SCALE: 1/2" = 1'-0"



FACILITY DRAWINGS
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REVISION	ENGINEERING COMPANY	PROJECT NO.	PROJECT NAME	DATE	CAD FILE NAME	REMARKS

FOR CITY OF PHOENIX USE ONLY – REFERENCE CID NUMBER: #

Contact Arizona 811 at least two full working days before you begin excavation
ARIZONA811 BLUE STAKE, INC.
Call 811 or click Arizona811.com

Registered Professional Engineer, Civil
CERTIFICATE NO. 41013
FERNANDO SARMIENTO
Date Signed 6/30/23
ARIZONA, U.S.A.

GREELEY AND HANSEN
2800 N. 44TH STREET, SUITE 650
PHOENIX, AZ 85008

REVISIONS				
NO.	BY	DATE	CKD	REMARKS

DES MT/RP
DWN RAM
CKD FS

City of Phoenix

CITY OF PHOENIX
WATER SERVICES DEPARTMENT
COLLECTION SYSTEMS
REMOTE FACILITIES

MECHANICAL PROCESS

LIFT STATION 76 PHASE II EXPANSION
BIOFILTER PLAN AND SECTION

CITY PROJECT NO. WS90400067
DATE: MAY 2023
M06 SHEET 17 OF 41
CAD FILE: 04276.05_M06

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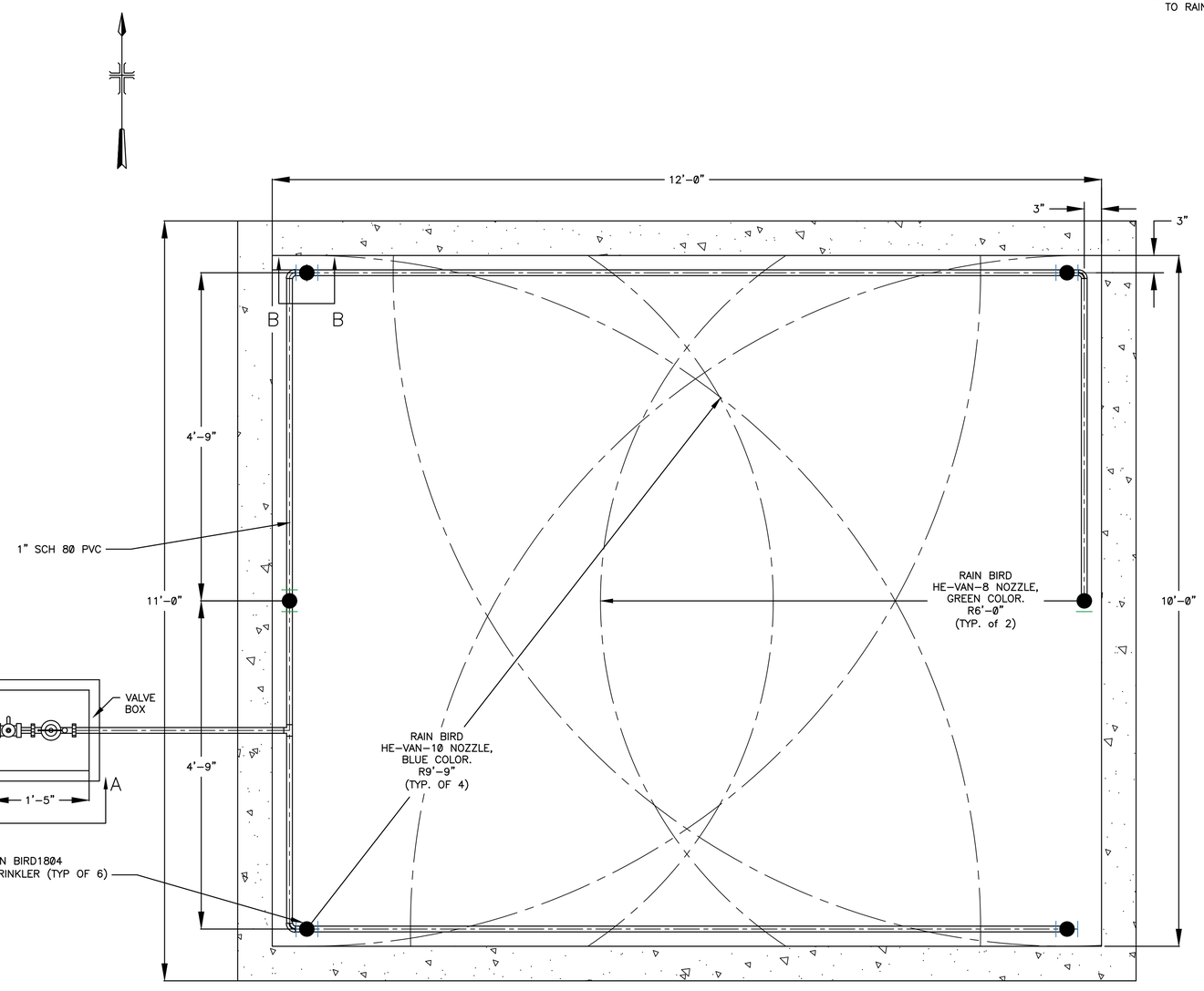
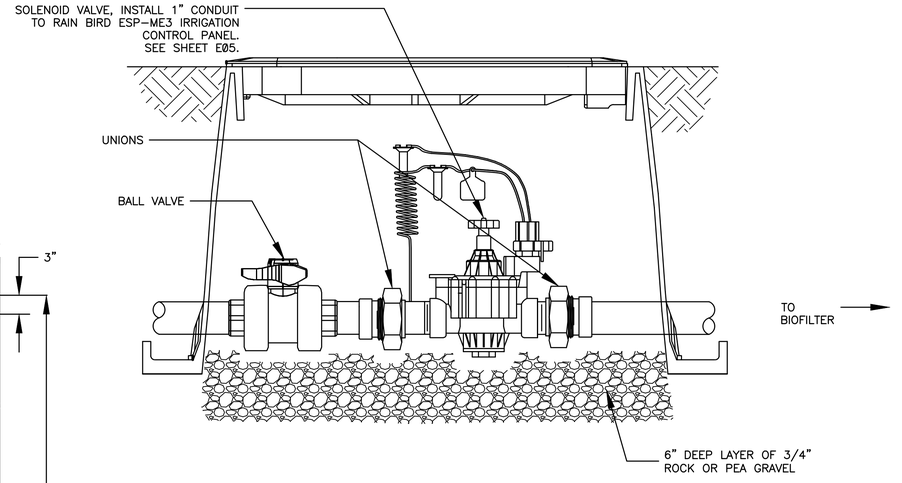
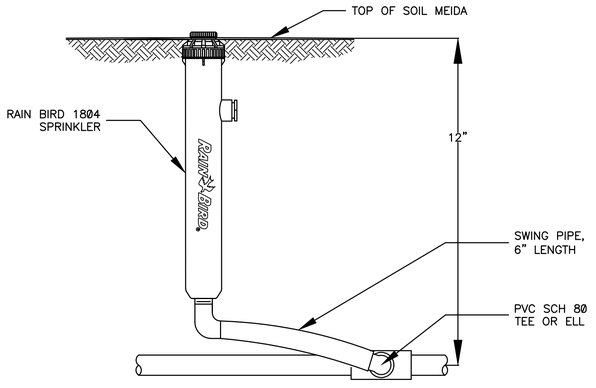


PLAN VIEW
NOT TO SCALE



SECTION A-1A
NOT TO SCALE



SECTION B-B
NOT TO SCALE

NOTES:
1. CONTRACTOR TO FIELD INSTALL THE SPECIFIED SPRAY NOZZLE ON EACH SPRINKLER.
2. CONTRACTOR TO ADJUST EACH SPRINKLER TO ACHIEVE THE ANGLE AND DISTANCE AS SHOWN ON THE SPRINKLER PLAN VIEW.

FACILITY DRAWINGS
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FOR CITY OF PHOENIX USE ONLY - REFERENCE CID NUMBER: #

REVISION	ENGINEERING COMPANY	PROJECT NO.	PROJECT NAME	DATE	CAD FILE NAME	DWG NUMBER	REMARKS

Registered Professional Engineer (Civil)
CERTIFICATE NO.
41013
FERNANDO
SARMIENTO
Date Signed
ARIZONA, U.S.A.

GREELEY AND HANSEN
2800 N. 44TH STREET, SUITE 650
PHOENIX, AZ 85008

REVISIONS				
NO.	BY	DATE	CKD	REMARKS

DES MT/RP
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City of Phoenix

CITY OF PHOENIX
WATER SERVICES DEPARTMENT
COLLECTION SYSTEMS
REMOTE FACILITIES

MECHANICAL PROCESS

LIFT STATION 76 PHASE II EXPANSION
BIOFILTER IRRIGATION PLAN

CITY PROJECT NO. WS90400067
DATE: MAY 2023
M07 SHEET 18 OF 41
CAD FILE: 04276.05_M07

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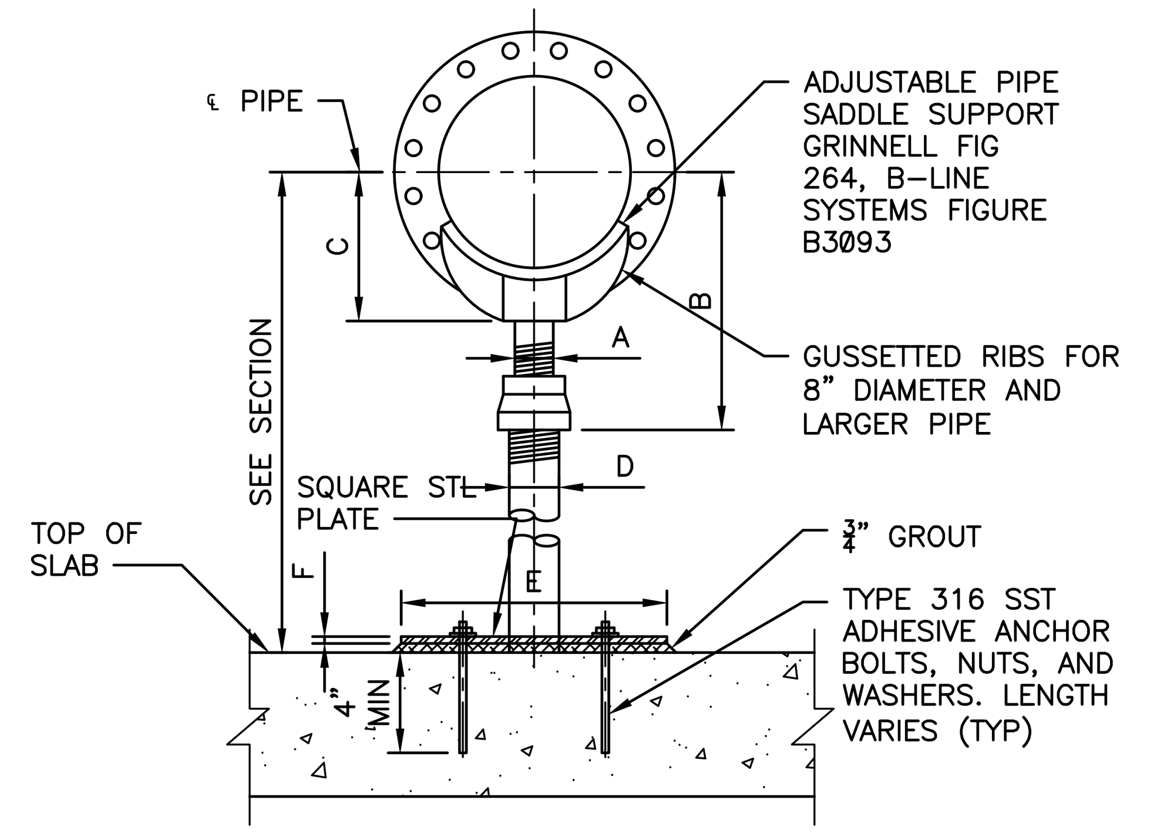
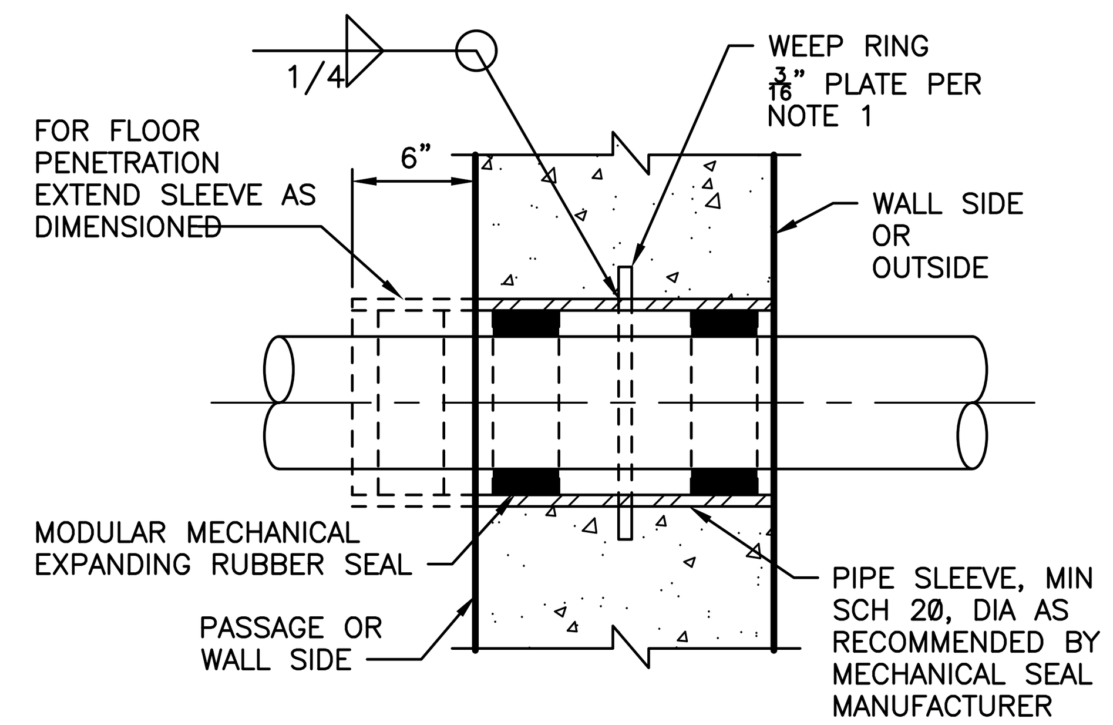


ADJUSTABLE PIPE SADDLE SUPPORT TABLE							
NOMINAL PIPE SIZE	NOMINAL A	B		C	NOMINAL D	E	F
		MIN	MAX				
14"	3"	16-1/4"	20-3/4"	10-15/16"	4"	10"	3/8"

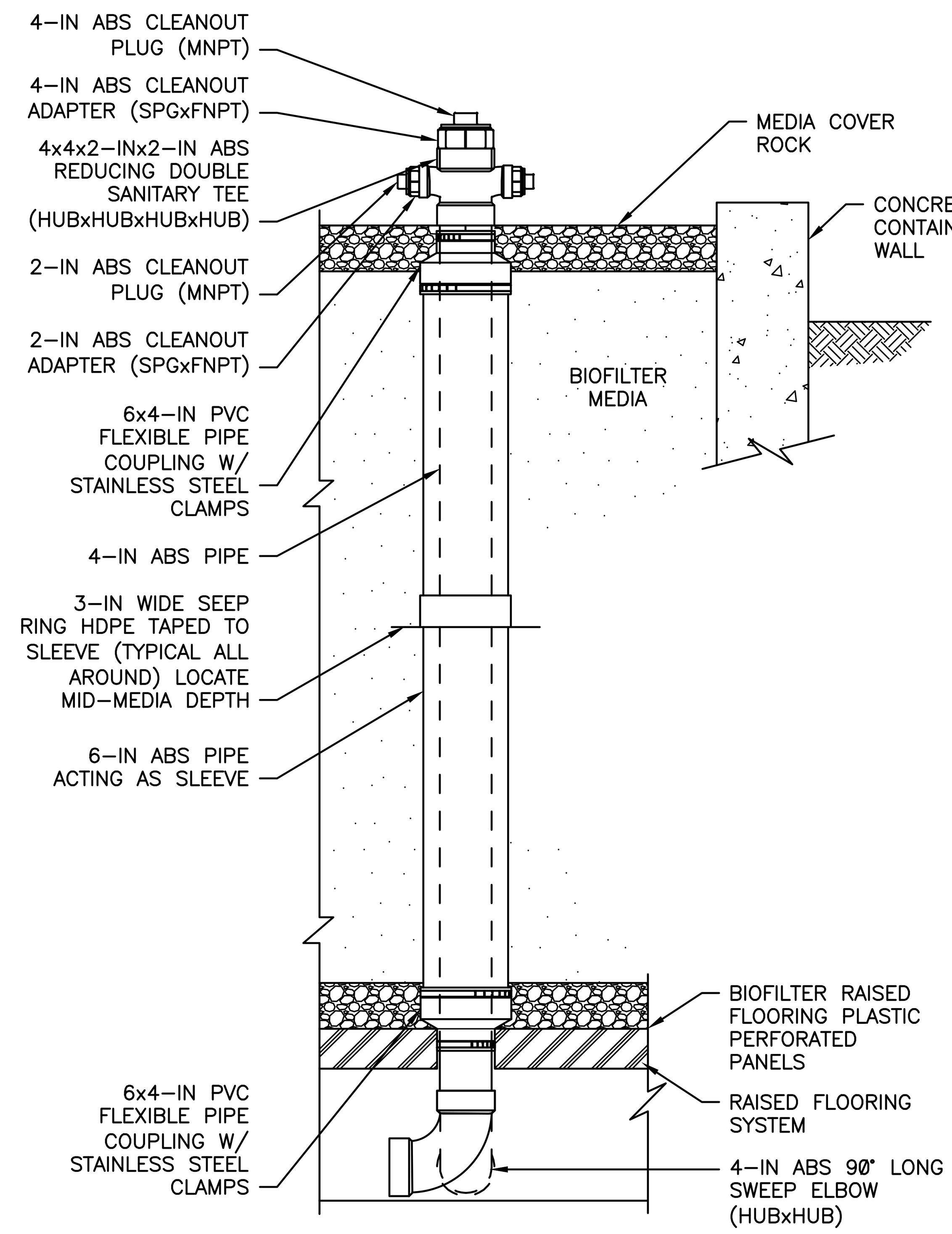
ADJUSTABLE PIPE SUPPORT DETAIL
SCALE: NTS



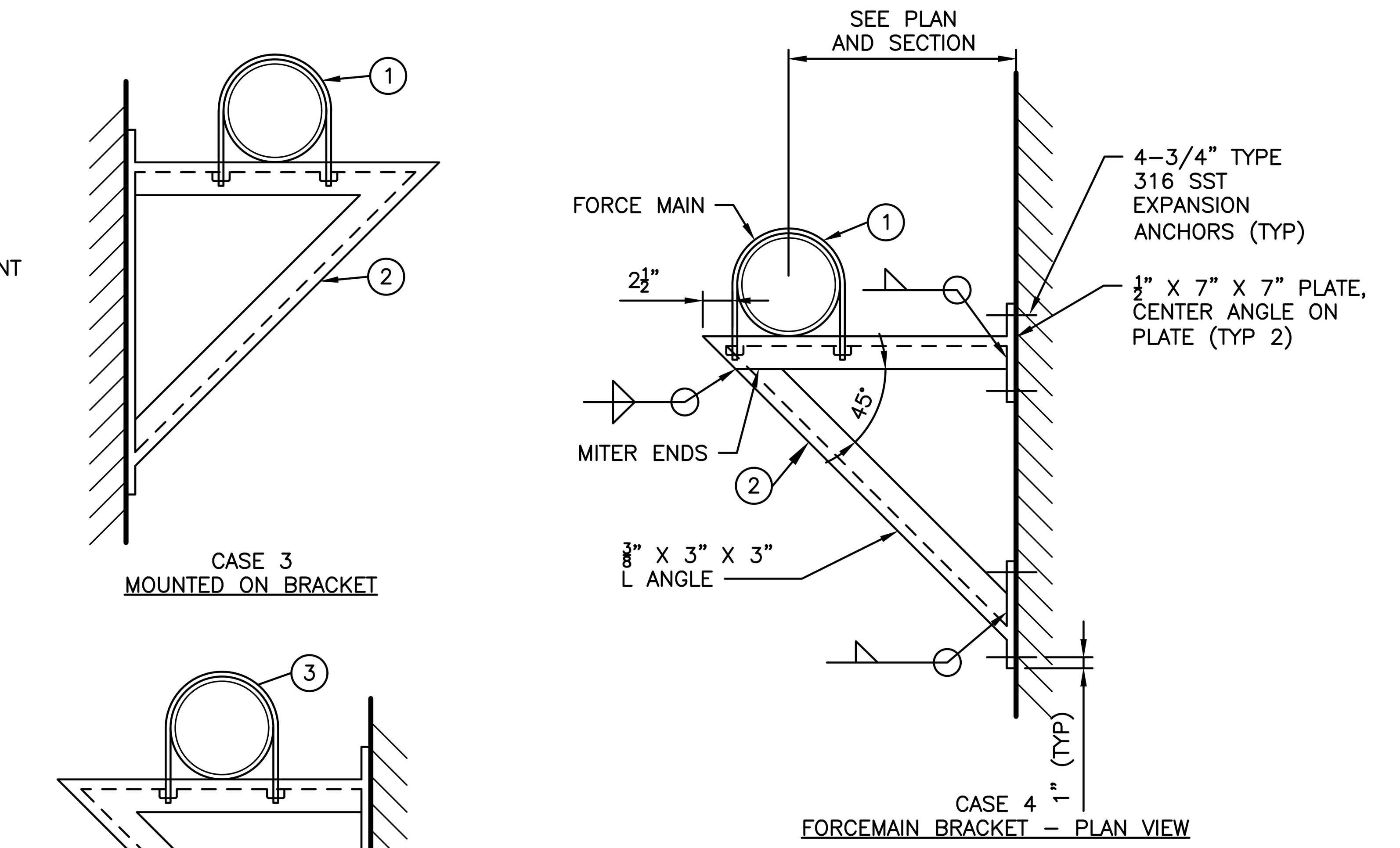
NOTES:

1. WEEP RING SHALL HAVE A MINIMUM DIAMETER 3" GREATER THAN THE OUTSIDE DIAMETER OF THE PIPE..
2. PIPE SLEEVE MATERIAL SHALL BE SST 316.

TYPE B WALL AND FLOOR PIPE PENETRATION DETAIL
SCALE: NTS



BIOFILTER CLEANOUT DETAIL
SCALE: NTS

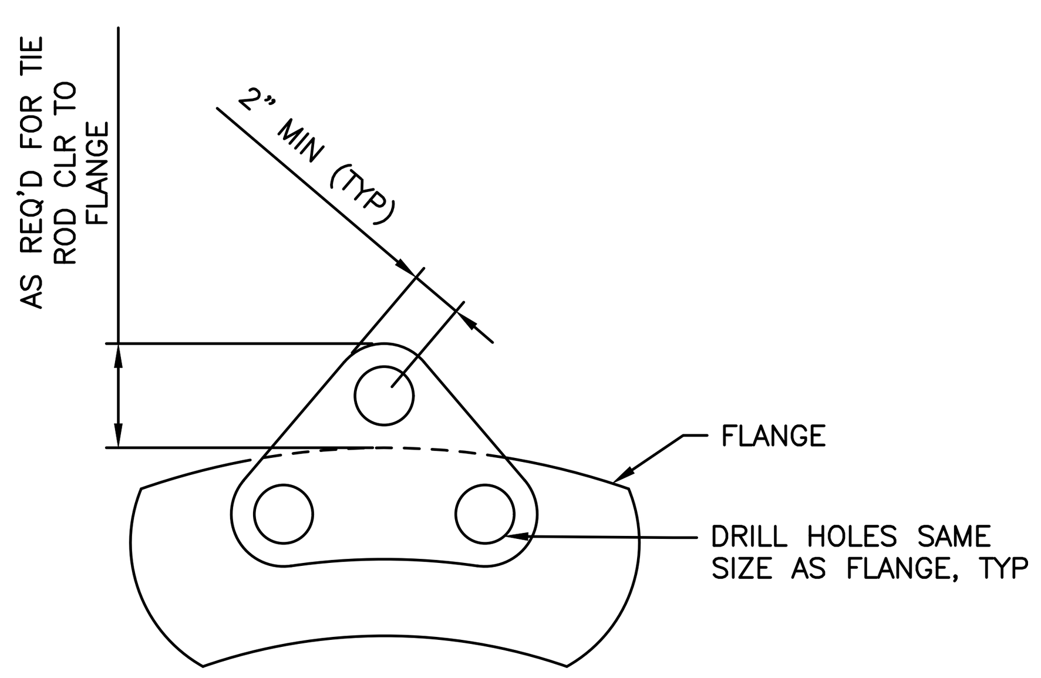


1. 1" U-BOLT PER GRINNELL CO #137
2. BRACKET SIMILAR TO GRINNELL CO #195 FOR LOAD NOT EXCEEDING 1,500 LBS AND SIMILAR TO #199 FOR LOADS OF 1,500 - 3,000 LBS. FOR LOADS GREATER THAN 3,000 LBS, BRACKETS MAY BE CONSTRUCTED OF CHANNELS OR ANGLES WITH REQUIRED STRENGTH. SUCH BRACKETS TO BE REVIEWED BY THE ENGINEER. WHEN LOADS ON BRACKETS ARE EXCESSIVE, FLANGES ARE TO BE INCREASED TO DISTRIBUTE THE LOAD OVER A LARGER AREA OF THE WALL.
3. 3/8" OR 1/2" U-BOLT PER GRINNELL COMPANY #137 FOR 2" AND 4" DIAMETER AIR RELIEF DRAINS AND 3" CARRIER PIPE DRAIN.

LOCATION OF HANGERS AND BRACKETS TO BE APPROVED BY ENGINEER.

ALL HANGERS, BRACKETS AND ANCHORS IN WET WELL, ODOR CONTROL FACILITY, AND VAULTS SHALL BE TYPE 316 SST.

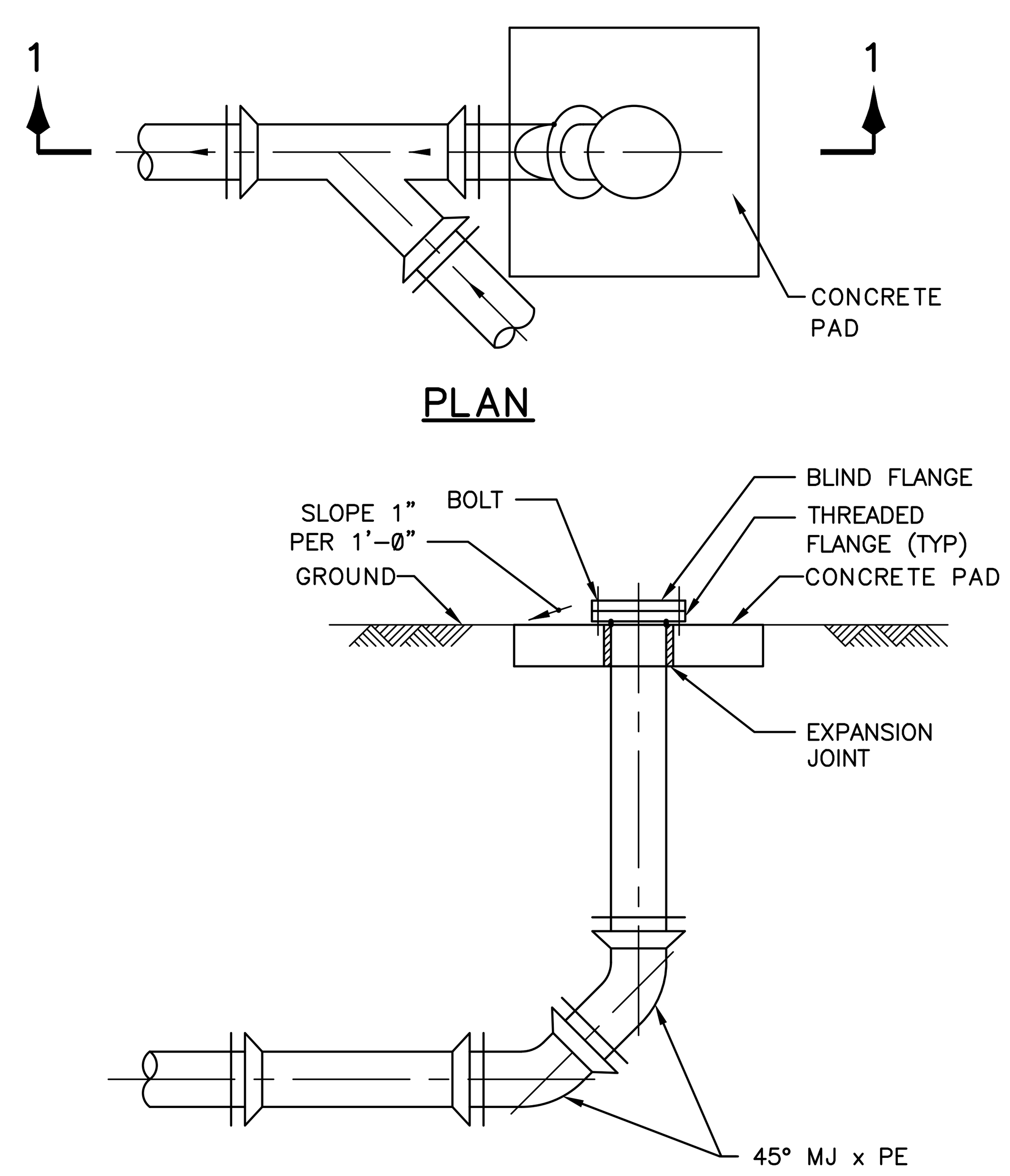
WATER AND SEWER PIPE HANGER DETAILS
SCALE: NTS



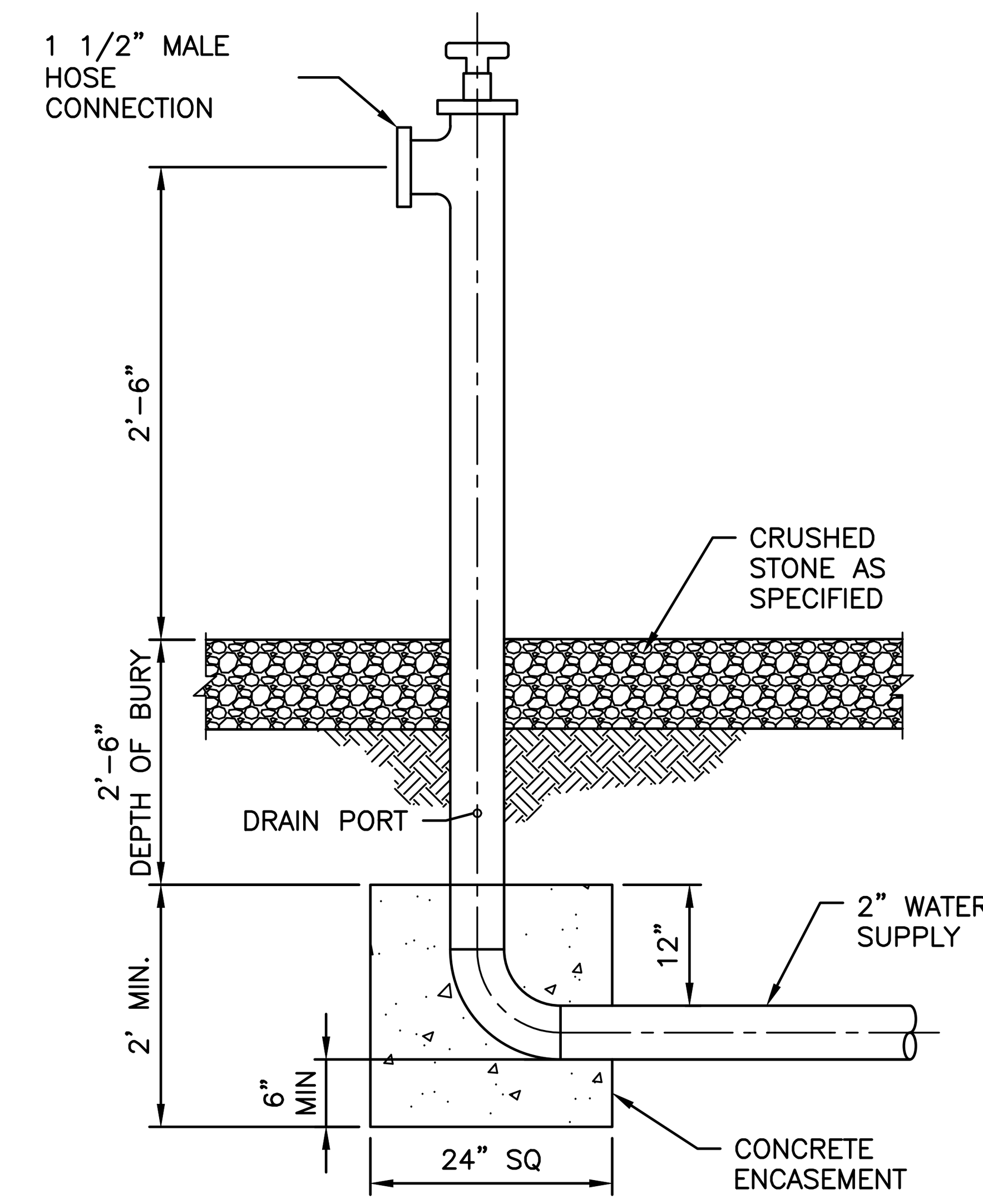
NOTES:

1. PLATE SHALL CONFORM TO ASTM A 283, GRADE D.

THRUST LUG DETAIL
SCALE: NTS



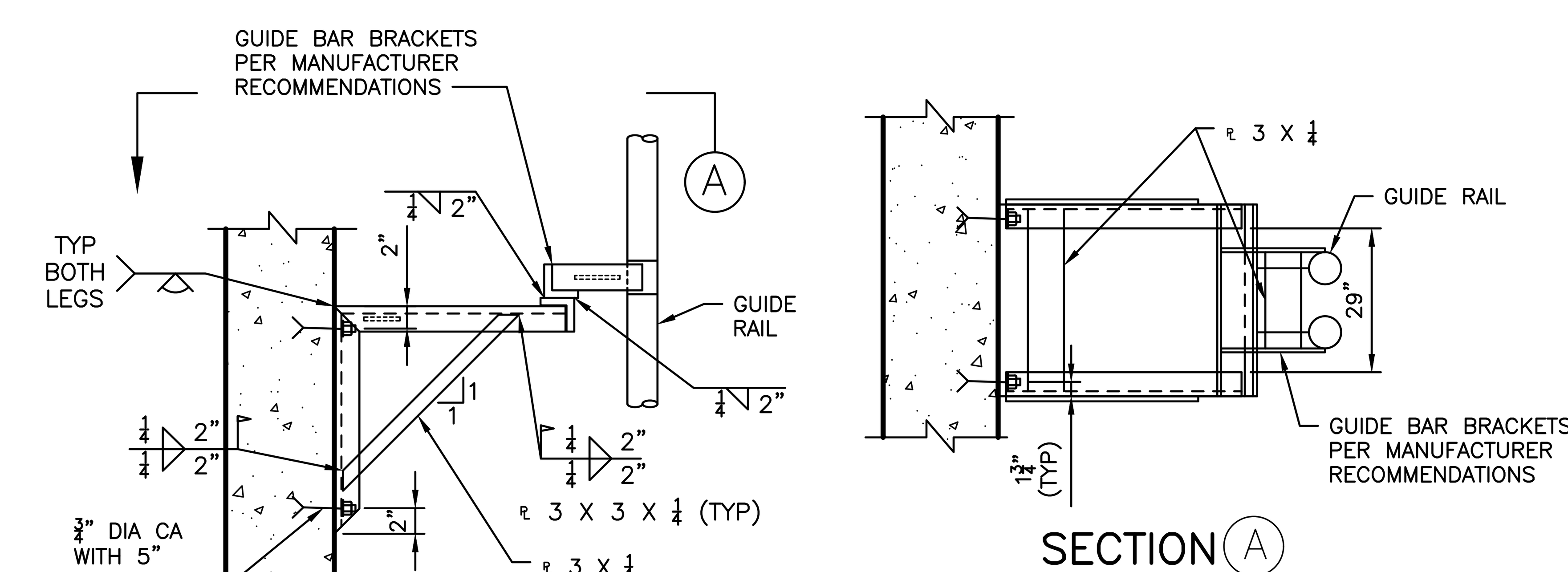
CLEANOUT DETAIL
NOT TO SCALE



NOTES:

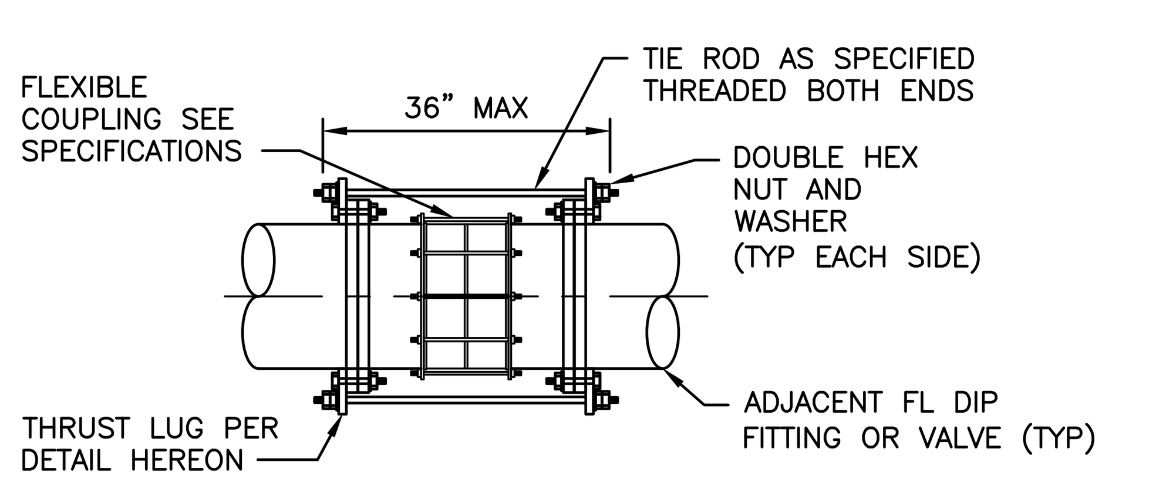
1. FIELD LOCATE HOSE BIB, CONFIRM WITH OWNER.
2. INSTALL GUARD POSTS FOR EACH HOSE BIB WHERE DIRECTED BY THE OWNER.

HOSE BIB DETAIL
SCALE: NTS



WALL MOUNTED INTERMEDIATE GUIDE BAR BRACKET DETAIL

SCALE: NTS



PIPE SIZE	TIE ROD DIA	NO TIE RODS REQ'D	TIE BOLT DIA
14"	3/4"	10"	1"

NOTES:

1. PROVIDE TIE RODS WHERE FLEXIBLE COUPLING RESTRAINTS ARE SPECIFIED AND AT ALL OTHER LOCATIONS INDICATED ON THE DRAWINGS.
2. ORIENTATE AND SPACE TIE RODS AS REQUIRED TO EVENLY DISTRIBUTE PIPE PRESSURE.
3. PROVIDE SUFFICIENT SPACE SO COUPLING CAN BE SLIPPED AT LEAST ONE DIRECTION TO CLEAR JOINT.

FLEXIBLE COUPLING RESTRAINT DETAIL
SCALE: NTS

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Registered Professional Engineer CERTIFICATE NO. 41013 FERNANDO SARMIENTO (Civil) Date Signed ARIZONA, U.S.A.

GREELEY AND HANSEN
2800 N. 44TH STREET, SUITE 650
PHOENIX, AZ 85008

REVISIONS				
NO.	BY	DATE	CKD	REMARKS

DES MT/RP
DWN RAM
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City of Phoenix

CITY OF PHOENIX
WATER SERVICES DEPARTMENT
COLLECTION SYSTEMS
REMOTE FACILITIES

MECHANICAL PROCESS
LIFT STATION 76 PHASE II EXPANSION
DETAILS 1

CITY PROJECT NO. WS90400067
DATE: MAY 2023
M08 SHEET 19 OF 41
CAD FILE: 04276.05_M08

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PUMP SCHEDULE

TAG No.	TYPE	RATING POINT CAPACITY (GPM)	HEAD (FT)	MIN. EFF. (%)	NPSH AVAILABLE	MIN SHUTOFF HEAD (FT)	MIN SUCTION/ DISCHARGE SIZE	PUMP RPM MIN	PUMP RPM MAX	SEAL TYPE	MOTOR DATA HP	MOTOR DATA RPM (MAX)	MOTOR DATA VOLTAGE	MOTOR DATA PHASES	MOTOR DATA MOTOR (HZ)	SPECS
PMP-001	SUBMERSIBLE	1700	94.1	72.2	–	182.5	6 IN	–	1775	MECHANICAL	60	1775	460	3	60	11212
PMP-002	SUBMERSIBLE	1700	94.1	72.2	–	182.5	6 IN	–	1775	MECHANICAL	60	1775	460	3	60	11212

EXPOSED PIPING SCHEDULE

ABBREV	SERVICE	SIZE	MATERIAL	JOINTS	SPECS
FM	RAW WASTEWATER	14 IN	DIP THICKNESS CLASS 53	FLANGED	15050
RWW	RAW WASTEWATER	2 IN	CPVC SCHEDULE 80	PLAIN END/SOLVENT WELD/FLANGED	15050

BURIED PIPING SCHEDULE

ABBREV	SERVICE	SIZE	MATERIAL	JOINTS	SPECS
SS	RAW WASTEWATER	18 IN	VCP EXTRA STRENGTH	BELL AND SPIGOT	15050
FM	RAW WASTEWATER	14 IN	DIP	FLANGED	15050
FM	RAW WASTEWATER	8 IN (OD)	DIP	WELDED/FLANGED	15050
D	RAW WASTEWATER	4 IN	CPVC SCHEDULE 80	WELDED/FLANGED	15050
D	RAW WASTEWATER	1 IN	CPVC SCHEDULE 80	THREADED	15050
FA	FOUL AIR	10 IN	FRP	FLANGED	15812
W	POTABLE WATER	2 IN	CPVC SCHEDULE 80	SOLDER TYPE WITH THREADED OR FLANGED ADAPTERS FOR VALVES	15050
W	POTABLE WATER	1 IN	CPVC SCHEDULE 80	SOLDER TYPE WITH THREADED OR FLANGED ADAPTERS FOR VALVES	15050

VALVE SCHEDULE

VALVE No.	VALVE TYPE AND SIZE	JOINT TYPE	ACTUATOR TYPE	SPECS
ARV-001	AIR RELIEF VALVE-2 IN	THREADED	NONE	15119
ARV-002	AIR RELIEF VALVE-2 IN	THREADED	NONE	15119
CV-001	CHECK VALVE-14 IN	FLANGED	NONE	15114
CV-002	CHECK VALVE-14 IN	FLANGED	NONE	15114
PV-001	PLUG VALVE-14 IN	FLANGED	MANUAL HAND WHEEL	15112
PV-002	PLUG VALVE-14 IN	FLANGED	MANUAL HAND WHEEL	15112
PV-003	PLUG VALVE-6 IN	FLANGED	MANUAL HAND WHEEL	15112
PV-004	PLUG VALVE-6 IN	FLANGED	MANUAL HAND WHEEL	15112
PV-005	PLUG VALVE-14 IN	FLANGED	MANUAL HAND WHEEL	15112
PV-006	PLUG VALVE-14 IN	FLANGED	MANUAL HAND WHEEL	15112
PV-007	PLUG VALVE-14 IN	FLANGED	MANUAL HAND WHEEL	15112

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Registered Professional Engineer (Civil) CERTIFICATE NO. 41013 FERNANDO SARMIENTO Date Signed 6/30/23 ARIZONA, U.S.A.

GREELEY AND HANSEN
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REVISIONS NO.	BY	DATE	CKD	REMARKS

DES MT
DWN RAM
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City of Phoenix

CITY OF PHOENIX
WATER SERVICES DEPARTMENT
COLLECTION SYSTEMS
REMOTE FACILITIES

MECHANICAL PROCESS

LIFT STATION 76 PHASE II EXPANSION
MECHANICAL SCHEDULES

CITY PROJECT NO. WS90400067
DATE: MAY 2023
M09 SHEET 20 OF 41
CAD FILE: 04276.05_M09

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GENERAL STRUCTURAL NOTES

A. GENERAL

1. UNLESS DETAILED, SPECIFIED, OR INDICATED OTHERWISE, CONSTRUCTION SHALL BE AS INDICATED IN THE APPLICABLE TYPICAL DETAILS AND GENERAL NOTES. TYPICAL DETAILS APPLY EVEN THOUGH NOT REFERENCED AT SPECIFIC LOCATIONS OR IN SPECIFIED CONTRACT DRAWINGS. WHERE SPECIFIC DETAILS OR NOTES DIFFER FROM TYPICAL DETAILS AND THESE GENERAL NOTES, THE SPECIFIC REQUIREMENTS GOVERN.
2. STRUCTURAL DIMENSIONS CONTROLLED BY, AFFECTED BY, OR AFFECTING MECHANICAL OR ELECTRICAL WORK, OR BY EQUIPMENT SUPPLIED, SHALL BE COORDINATED AND VERIFIED BY THE PRIME CONTRACTOR PRIOR TO CONSTRUCTION. IF THIS COORDINATION REQUIRES ANY CHANGE TO THE STRUCTURAL DRAWINGS, SUCH CHANGE SHALL BE SUBMITTED FOR THE ENGINEER'S APPROVAL PRIOR TO WORK.
3. MECHANICAL AND ELECTRICAL SUPPORTS, ANCHORAGES, OPENINGS, AND RECESSES NOT SHOWN ON THE STRUCTURAL DRAWINGS, BUT REQUIRED TO COMPLETE OTHER PORTIONS OF THE WORK, SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL AND SHALL BE PROVIDED PRIOR TO PLACING CONCRETE.
4. STRUCTURES HAVE BEEN DESIGNED FOR OPERATIONAL LOADS ON THE COMPLETED STRUCTURES. UNLESS OTHERWISE INDICATED, CONCRETE TANKS HAVE BEEN DESIGNED FOR TESTING PRIOR TO BACKFILLING, AND CONCRETE STRUCTURES HAVE BEEN DESIGNED FOR DEAD LOADS AT 75% OF SPECIFIED CONCRETE STRENGTH; DURING CONSTRUCTION, ALL OTHER CONSTRUCTION LOADS SHALL BE ACCOMMODATED BY SHORING, BRACING, OR OTHER PROTECTION, BY THE CONTRACTOR.
5. ANY CHANGES TO THE DESIGN WHICH ARE PROPOSED BY THE CONTRACTOR SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COORDINATION AND COST OF CHANGES TO ANY COMPONENTS OCCASIONED BY SUCH CHANGE. THE COST OF ANY DESIGN WORK NECESSITATED BY SUCH PROPOSAL SHALL BE BORNE BY THE CONTRACTOR.
6. THE STRUCTURES HEREIN HAVE BEEN DESIGNED TO THE CODES AND STANDARDS SPECIFIED BELOW. ANY ITEMS DESIGNED BY THE CONTRACTOR SHALL MEET THESE SAME REQUIREMENTS. SUCH DESIGNS SHALL BE PREPARED AND SEALED BY AN ENGINEER REGISTERED TO PRACTICE IN THE STATE OF ARIZONA.
7. UNLESS OTHERWISE SHOWN OR SPECIFIED, FINISHED GRADE AROUND STRUCTURES, SHOWN GENERICALLY, MAY INDICATE GROUND SURFACE, TOP OF CONCRETE SLABS ON GRADE, OR PAVEMENT. FOR TYPES OF FINISHED SURFACES, REFER TO CIVIL OR ARCHITECTURAL DRAWINGS.
8. GUARDRAILS, HANDRAILS, LADDERS, STAIRS, CATWALKS, ELEVATORS, AND SIMILAR SAFETY DEVICES SHALL CONFORM TO THE LATEST FEDERAL AND STATE OSHA REQUIREMENTS, AND TO THE BUILDING CODE.
9. SHOP DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER PRIOR TO FABRICATION.

B. CODES AND STANDARDS

1. THE AGENCY HAVING BUILDING CODE JURISDICTION IS CITY OF PHOENIX, ARIZONA.
2. INTERNATIONAL BUILDING CODE, 2018 EDITION (IBC), INCLUDING OTHER CODES & STANDARDS REFERENCED THEREIN, PROVIDES MINIMUM REQUIREMENTS..
3. RISK CATEGORY: III
4. LOADING:
   A) DEAD LOADS: ACTUAL LOADS.
      LOADS FOR EQUIPMENT PROVIDED BY THE CONTRACTOR SHALL BE THE ACTUAL LOADS, AS PROVIDED BY THE MANUFACTURER OF THE EQUIPMENT.
   B) LIVE LOADS:
      ROOF 20 PSF,
      FLOOR, GRATINGS, STAIRS, SOFFITS, ETC. 100 PSF,
      SLABS-ON-GRADE & DRAINAGE STRUCTURES H-20,
      RAILINGS 50 PLF,
   C) ROOF SNOW LOAD: ZERO.
   D) WIND LOADING:
      BASIC WIND SPEED (3-SECOND GUST): 108 MPH,
      EXPOSURE: C
      MINIMUM PRESSURE: 16 PSF
   E) SEISMIC LOADING:
      SEISMIC IMPORTANCE FACTOR: 1.25
      MAPPED SPECTRAL RESPONSE ACCELERATION: S_S= 0.251, S_1 =0.079
      SITE CLASS: D
      SPECTRAL RESPONSE COEFFICIENTS: S_{DS}=0.268, S_{D1}=0.127
      SEISMIC DESIGN CATEGORY: B
      ANALYSIS PROCEDURE: EQUIVALENT LATERAL FORCE
      BASIC SEISMIC FORCE RESISTING SYSTEMS:
      CONCRETE TANKS, NON-SLIDING BASE: R= 2.0, Cs= 0.167 DESIGN BASE SHEAR: V= Cs W
5. MANHOLES, CATCH BASINS, AND SIMILAR STRUCTURES SHALL BE PER MAG STANDARD DETAILS.

C. EARTHWORK.

1. DESIGN IS BASED ON IBC PRESUMPTIVE VALUES FOR SILT (ML)
2. PRIOR TO PLACEMENT OF FILL OR FORMING OR REBAR PLACEMENT FOR ANY STRUCTURE, FOOTING, GRADE SLAB OR TANK:
   A) REMOVE ANY VEGETATION OR TOPSOIL AND DISPOSE OF IT.
   B) EXCAVATE TO SUBGRADE INDICATED AND SCARIFY TO 12" DEPTH AND RECOMPACT TO 95% MAXIMUM DENSITY WITHIN ±2% OF OPTIMUM MOISTURE CONTENT.
   C) OBTAIN ENGINEER'S APPROVAL OF SUBGRADE PREPARATION.
3. EXCAVATIONS SHALL BE CARRIED OUT TO A 1½:1 SLOPE.
4. FILL AND BACKFILL SHALL BE CARRIED OUT IN LIFTS OF A MAXIMUM OF 8" . TESTING SHALL BE PERFORMED AT LEAST EVERY SECOND LIFT.
5. GRADE TO DRAIN AWAY FROM STRUCTURES, A MINIMUM GRADE OF 2% FOR A MINIMUM OF 4'-0" FROM STRUCTURE PERIMETER, EXCEPT THAT GRADING AWAY FROM BURIED FOOTERS SHALL BE FOR 4'-0" FROM PIERS FOUNDED ON THESE.
6. SOIL VALUES (UNFACTORED):
   A) BEARING CAPACITY: 1500 LB/FT^2
   B) ACTIVE PRESSURE: 60 LB/FT^3
   C) AT-REST PRESSURE: 100 LB/FT^3
   D) PASSIVE PRESSURE: 200 LB/FT^3
   E) FRICTION FACTOR: 0.25

D. CONCRETE

1. ALL CONCRETE TANKS AND CONTAINMENT STRUCTURES ARE "WATER-BEARING", WATER-BEARING CONCRETE STRUCTURES, INCLUDING REINFORCING, SHALL COMPLY WITH ACI "CODE REQUIREMENTS FOR ENVIRONMENTAL ENGINEERING CONCRETE STRUCTURES" (ACI 350-06).
2. ALL OTHER CONCRETE CONSTRUCTION, INCLUDING REINFORCING, SHALL COMPLY WITH ACI "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE" (ACI 318-14).
3. NON-STRUCTURAL CONCRETE IS CONCRETE FOR THRUST BLOCKS, ENCASEMENTS, FILL, CURBS AND SIDEWALKS. STRUCTURAL CONCRETE IS ALL OTHER CONCRETE.
4. STRUCTURAL CONCRETE:
   A) MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI IN 28 DAYS.
   B) WATER-CEMENT RATIO SHALL NOT EXCEED 0.45.
   C) MINIMUM CEMENT CONTENT: 600 lb/yd^3
   D) SLUMP AT POINT OF PLACEMENT SHALL NOT EXCEED 3" ±1". IF SUPERPLASTICIZER IS USED, IT SHALL BE ADDED AT THE JOB SITE, AFTER VERIFYING THAT THE SLUMP (BEFORE PLASTICIZING) DOES NOT EXCEED 3" ±1". SUPERPLASTICIZED CONCRETE SLUMP SHALL NOT EXCEED 7" ±1".
   E) MAXIMUM AGGREGATE SIZE: 1" (ASTM C-33, SIZE 67).
5. NON-STRUCTURAL CONCRETE
   A) MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI IN 28 DAYS.
   B) WATER-CEMENT RATIO SHALL NOT EXCEED 0.550.
   C) MINIMUM CEMENT CONTENT: 520 lb/cy
   D) SLUMP AT POINT OF PLACEMENT SHALL NOT EXCEED 4" ±1".
   E) MAXIMUM AGGREGATE SIZE: 1½" (ASTM C-33, SIZE 467).
6. POZZOLANS SHALL BE USED IN WATER-BEARING STRUCTURES AND MAY BE USED IN OTHER CONCRETE: FLY ASH, PER ASTM C618 CLASS F, 10%-20% REPLACEMENT OF CEMENT.
7. HIGH-RANGE WATER REDUCER (SUPERPLASTICIZER) SHALL BE USED IN CURBS AND PEDESTALS AND FOR THE FIRST LIFT OF WALLS AND COLUMNS PLACED AGAINST HARDENED CONCRETE. IT MAY BE USED IN SUBSEQUENT LIFTS IN WALLS AND COLUMNS.
8. SUBMIT MIX DESIGNS, INCLUDING STRENGTH HISTORY, FOR APPROVAL.
9. LOCATION OF ALL CONSTRUCTION, CONTRACTION, AND EXPANSION JOINTS SHALL BE AS SHOWN ON THE DRAWINGS OR APPROVED BY THE ENGINEER. CONSTRUCTION JOINTS SHALL BE THOROUGHLY CLEANED AND INTENTIONALLY ROUGHENED FOR BOND. PROVIDE WATER STOPS IN ALL CONSTRUCTION JOINTS IN WATER BEARING SLABS AND WALLS
10. EMBEDDED ITEMS SHALL BE FIRMLY HELD INTO POSITION IN THE FORMWORK OR MASONRY AND SHALL NOT BE "WET STABBED" INTO FRESHLY PLACED CONCRETE OR GROUT.
11. EXPANSION JOINTS SHALL HAVE EDGES ROUNDED TO 1/4" RADIUS, USE 1/2" CORK OR CANE-FIBER FORM BOARD, EXCAVATED TO 1/2" DEPTH AND FILLED WITH AN APPROVED POLY-SULFIDE CAULK.
12. DO NOT PLACE ANY CONCRETE WHOSE TEMPERATURE IS ABOVE 90°F. DO NOT PLACE ANY CONCRETE THAT IS MORE THAN 90 MINUTES OLD, SINCE BATCH TIME.
13. UNLESS SELF-CONSOLIDATING CONCRETE IS APPROVED AS SUCH, ALL CONCRETE SHALL BE CONSOLIDATED BY INTERNAL VIBRATION.
15. PROVIDE A MINIMUM OF 7 DAYS MOIST CURING OF ALL CONCRETE. IF DAYTIME HIGHS ARE ABOVE 95°F, USE WATER CURE ONLY (NOT MEMBRANE CURE).
16. FORMS & SHORES SHALL NOT BE REMOVED FROM SUSPENDED SLABS AND BEAMS UNTIL THEY HAVE ATTAINED AT LEAST 75% OF SPECIFIED STRENGTH.

E. REINFORCING STEEL

1. ALL DETAILING, FABRICATION, AND PLACEMENT OF REINFORCING SHALL BE IN ACCORDANCE WITH ACI 318-14, AND THE "MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES", ACI 315-LATEST EDITION.
2. REINFORCING STEEL SHALL BE DEFORMED BARS OR WELDED WIRE MESH CONFORMING IN QUALITY TO THE REQUIREMENT FOR DEFORMED BILLET-STEEL BARS FOR CONCRETE REINFORCEMENT, ASTM A615, GRADE 60. WELDED REINFORCING STEEL SHALL BE LOW-ALLOY ASTM A706.
3. ALL REINFORCEMENT AT CORNERS OR JUNCTIONS OF WALLS, CURBS AND/OR SLABS SHALL BE CONTINUOUS, LAPPED AS SPECIFIED BELOW, OR TERMINATED IN A STANDARD HOOK.
4. AT CONSTRUCTION JOINTS, COLUMNS, AND MASONRY GROUT LIFTS, REINFORCING SHALL BE DOWELED. UNLESS SHOWN OTHERWISE, DOWELS SHALL HAVE THE SAME DIAMETER AND SPACING AS REINFORCING WHICH IS TO BE SPLICED TO IT. DOWELS SHALL BE FIRMLY HELD INTO POSITION IN THE FORMWORK OR MASONRY AND SHALL NOT BE "WET STABBED" INTO FRESHLY PLACED CONCRETE OR GROUT.
5. CONCRETE COVER OVER REINFORCING SHALL BE AS FOLLOWS:
   A) SURFACES NOT EXPOSED TO EARTH, WEATHER OR WATER:1-1/2"
   B) SURFACES EXPOSED TO EARTH, WEATHER OR WATER:2"
   C) CONCRETE PLACED DIRECTLY AGAINST EARTH: 3"
   D) CONCRETE SHALL BE PLACED WITH A TOLERANCE OF ±1/2" OF THE COVER SPECIFIED AND ±3" OF THE LATERAL POSITION SPECIFIED.
   E) WHERE CONCRETE IS PLACED AGAINST THE SIDES OF EXCAVATIONS, EXCAVATIONS MUST BE CAREFULLY TRIMMED SO THAT SIDE COVER IS NO MORE THAN 6". IF THIS REQUIREMENT IS NOT MET, FORMS MUST BE INSTALLED OR SUPPLEMENTAL REINFORCING PROVIDED.
6. BAR SUPPORTS AND SPACERS SHALL MEET THE REQUIREMENTS OF THE ACI, AND SHALL BE PLASTIC OR PLASTIC-COATED WIRE IN WALLS AND SUSPENDED SLABS. IN SLABS ON GRADE AND FOOTINGS, THEY SHALL BE 4000 PSI CONCRETE BLOCKS.
7. THE MINIMUM LENGTH OF LAPS OF REINFORCING (CLASS B SPLICES) SHALL BE:
   A) 36 BAR DIAMETERS FOR HORIZONTAL BARS IN CONCRETE WALLS AND TOP BARS IN SLABS > 14" THICK (≤ #6)
   B) 30 BAR DIAMETERS FOR OTHER BARS IN CONCRETE WALLS & SLABS (≤ #6)

E. REINFORCING STEEL (CONT.)

8. SUBMIT SHOP DRAWINGS OF ALL REINFORCING FOR APPROVAL PRIOR TO PLACEMENT. SHOP DRAWINGS SHALL BE PER ACI DETAILING MANUAL, ACI SP.
9. SUBMIT MANUFACTURER'S DATA ON ALL COUPLERS, MECHANICAL SPLICERS, REBAR POSITIONERS, DOBIES, CHAIRS, AND OTHER REINFORCEMENT ACCESSORIES FOR APPROVAL PRIOR TO PLACEMENT.

F. STRUCTURAL STEEL

1. STEEL CONSTRUCTION SHALL CONFORM TO THE SPECIFICATIONS AND STANDARDS CONTAINED IN THE LATEST EDITION OF THE AISC STEEL CONSTRUCTION MANUAL. BOLTING SHALL CONFORM TO THE AISC SPECIFICATION FOR BOLTING USING A325 BOLTS. WELDING SHALL CONFORM TO AWS STRUCTURAL WELDING CODE, D1.1.
2. UNLESS OTHERWISE SPECIFIED STEEL SHALL CONFORM TO:
   A) SHAPES, PLATES, & BARS ASTM A36
   B) STRUCTURAL TUBING ASTM A500, GRADE B
   C) PIPE ASTM F1043, GRADE B, 50 KSI YIELD
   D) WIDE FLANGE SECTIONS ASTM A992
   E) ANCHOR BOLTS ASTM A307, 3/4" DIA. MINIMUM
   F) BOLTS ASTM A325, TYPE 1, GALV, 5/8" DIA. MINIMUM
   G) WELDING E70XX, 3/16" MINIMUM
3. HARDENED, HEAVY-DUTY WASHERS OR PLATE WASHERS SHALL BE USED AT ALL OVERSIZED OR SLOTTED HOLES. WASHERS SHALL NOT BE USED AT STANDARD HOLES, UNLESS PREVIOUSLY APPROVED BY THE ENGINEER.
4. ALL WELDS SHALL BE SLAGGED AND SHALL REMAIN UNPAINTED UNTIL INSPECTION HAS BEEN COMPLETED AND APPROVED.
5. WELDING SHALL BE IN ACCORDANCE WITH PRE-QUALIFIED PROCEDURES, BY WELDERS CERTIFIED FOR THE MATERIAL, WELD, POSITION, AND PROCEDURES EMPLOYED. TUBE WELDING OF T-, Y- AND K- CONNECTIONS (DESIGNATED "TUBE" SHALL BE PER AWS D1.1. FIGURE 3.4, 3.5, OR 3.6, AS APPLICABLE. OTHER WELDING SHALL BE PER AWS D1.1, FIGURE 3.3. EACH WELD SHALL BE FULLY DETAILED ON SHOP DRAWINGS PER AWS A2.4.
6. FIELD WELDING SHALL NOT BE PERFORMED UNLESS SPECIFICALLY SHOWN AS SUCH IN THESE DRAWINGS, OR ON APPROVED SUBMITTALS.
7. STEEL ENCASED IN CONCRETE SHALL NOT BE PAINTED, AND SHALL, AT TIME OF CONCRETE PLACEMENT, BE CLEAN AND FREE OF DELETERIOUS SUBSTANCES.
8. SUBMIT SHOP DRAWINGS, FOR APPROVAL, PRIOR TO FABRICATION.
9. IF FABRICATION, MEASUREMENT OR INSTALLATION ERRORS NECESSITATE FIELD MODIFICATION OF STRUCTURAL STEEL, THE ENGINEER SHALL BE CONSULTED PRIOR TO THE MODIFICATION, AND HIS/HER INSTRUCTIONS SHALL BE FOLLOWED. THIS SHALL BE PERFORMED AT NO ADDITIONAL COST TO THE OWNER.

G. MISCELLANEOUS METALS AND FRP FABRICATIONS.

1. CARBON STEEL FABRICATIONS SHALL MEET THE REQUIREMENTS GIVEN ABOVE FOR STRUCTURAL STEEL. SUCH FABRICATIONS SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION, UON.
2. STAINLESS STEEL SHAPES, PLATES, BARS, AND SHEET SHALL BE PER ASTM A240, TYPE 304 OR 316. STAINLESS STEEL FASTENERS AND ANCHORS SHALL BE PER ASTM A320, TYPE 316. WELDING SHALL BE PER AWS D1.6.
3. ALUMINUM CONSTRUCTION SHALL BE PER THE ALUMINUM CONSTRUCTION MANUAL OF THE ALUMINUM ASSOCIATION, LATEST EDITION. SHAPES, PLATES, AND BARS SHALL BE 6061-T6, PER ASTM B221, UON. WELDING SHALL BE IN ACCORDANCE WITH AWS D1.2.
4. ALUMINUM SURFACES IN CONTACT WITH CONCRETE OR MASONRY SHALL BE PAINTED WITH HEAVY ALKALI-RESISTANT BITUMINOUS PAINT.
5. GRATING, CHECKER PLATE, AND ACCESS DOORS.
   A) UON, ALL GRATING, FLOOR PLATES, AND HORIZONTAL ACCESS DOORS SHALL BE DESIGNED FOR 100 PSF LIVE LOAD, WITH A MAXIMUM DEFLECTION OF ¼". DESIGN OF GRATING AND FLOOR PLATES SHALL NOT DEPEND UPON FASTENERS TO MEET THESE GRAVITY LOADING REQUIREMENTS.
   B) GRATING SHALL BE BANDED (METAL) OR SEALED (FRP) ON ALL EDGES. IF CUTTING OF MORE THAN 2 ADJACENT BEARING BARS IS REQUIRED, PROVIDE REINFORCING OR SUPPLEMENTARY SUPPORTS.
   C) FLOOR PLATES SHALL HAVE A NON-SLIP FINISH. IF CUTTING OF MORE THAN 2½" WIDTH IS REQUIRED, PROVIDE REINFORCING OR SUPPLEMENTARY SUPPORTS.
   D) UNLESS OTHERWISE SPECIFIED, THESE SHALL BE MADE OF ALUMINUM.

H. MECHANICAL/ELECTRICAL SUPPORT

1. EQUIPMENT, PIPE, CONDUIT, AND SIMILAR ITEMS SHALL BE SUPPORTED IN ACCORDANCE WITH THE MECHANICAL/ELECTRICAL SPECIFICATIONS AND DRAWINGS AND THE ADDITIONAL REQUIREMENTS IN THE STRUCTURAL DRAWINGS AND SPECIFICATIONS.
2. ALL EQUIPMENT, PIPES, CONDUITS, AND CABLE TRAYS SHALL BE ANCHORED AND/OR BRACED PER SMACNA SEISMIC RESTRAINT MANUAL, SEISMIC HAZARD LEVEL (SHL) D.
4. MEMBERS, CHANNELS, FITTINGS & FASTENERS IN CHLORINE CONTAINMENT AREAS SHALL BE FRP. IN ALL OTHER CORROSIVE OR WET LOCATIONS THEY SHALL BE STAINLESS STEEL. IN OTHER LOCATIONS, THESE SHALL BE GALVANIZED.
5. FASTENERS CONNECTING FITTINGS TO CHANNEL OR CHANNEL TO CHANNEL SHALL BE 1/2" DIAMETER UNLESS OTHERWISE SHOWN.
6. ALL HOLES IN FITTINGS SHALL BE UTILIZED FOR FASTENING EXCEPT AS OTHERWISE SHOWN.

I. FASTENERS

1. FASTENERS IN SUBMERGED OR CORROSIVE AREAS, AND FOR FASTENING ALUMINUM, STAINLESS STEEL AND FRP FITTINGS SHALL BE TYPE 316 STAINLESS STEEL OTHER FASTENERS SHALL BE CARBON STEEL.

J. TESTING AND INSPECTION

1. BUILDING INSPECTION PER THE BUILDING CODE SHALL BE PERFORMED BY THE JURISDICTION. IF NO BUILDING PERMIT IS REQUIRED, THESE INSPECTIONS SHALL BE PERFORMED BY THE ENGINEER.
2. SPECIAL INSPECTION AND TESTING SHALL BE PERFORMED BY THE ENGINEER. THE CONTRACTOR SHALL PROVIDE 24 HOURS' PRIOR NOTICE AND SAFE ACCESS FOR THESE INSPECTIONS AND SHALL ENSURE THAT WORK IS READY FOR INSPECTION AS SCHEDULED.
3. PERIODIC (HOLD-POINT) INSPECTION IS REQUIRED FOR THE FOLLOWING WORK:
   A) COMPLETION OF SUBGRADE PREPARATION, PRIOR TO REBAR INSTALLATION, FOR FOOTINGS AND MATS.
   B) INSTALLATION OF REBAR AND EMBEDS FOR MASONRY WALLS, AND FOR CONCRETE FOOTINGS, WALLS, ELEVATED SLABS, AND FOUNDATION SLABS. PERFORMED AT LEAST TWO HOURS BEFORE CONCRETE OR GROUT PLACEMENT
   C) WELDING FOR ALL FILLET WELDS 5/16" AND SMALLER, PERFORMED AT COMPLETION OF ALL WELDING, AFTER WELDS ARE SLAGGED, AND BEFORE PAINTING OR COVERING.
   D) CONNECTIONS USING A325, A490, GRADE 8, OR OTHER HIGH-STRENGTH BOLTS; PERFORMED AFTER ALL BOLTING IS COMPLETE, AND BEFORE PAINTING OR COVERING.
   E) ANY WEDGE ANCHORS EXCEEDING 3/8" IN DIAMETER, PERFORMED AFTER ALL SUCH ANCHORS FOR A GIVEN STRUCTURE ARE INSTALLED AND BEFORE TRIMMING.
4. CONTINUOUS SPECIAL INSPECTION IS REQUIRED DURING ALL ASPECTS OF THE FOLLOWING:
   A) CONCRETE PLACEMENT FOR STRUCTURAL CONCRETE.
   B) DURING WELDING FOR FILLET WELDS LARGER THAN 5/16" & FOR ALL GROOVE WELDING.
   C) EPOXY ANCHORS EXCEEDING 3/8" DIAMETER, AFTER DRILLING.
5. WELDS NEED NOT HAVE SPECIAL INSPECTION WHEN THE WELDING IS DONE IN AN APPROVED FABRICATOR'S SHOP. HOWEVER, THE APPROVED FABRICATOR MUST SUBMIT A CERTIFICATE OF COMPLIANCE IN ACCORDANCE WITH IBC SECTION 1704.2.5.1. NO FABRICATION WORK SHALL BE PERFORMED OFF OF THE PROJECT SITE, EXCEPT IN THE APPROVED FABRICATOR'S SHOP.

K. DEFERED SUBMITTALS.

1. THE FOLLOWING STRUCTURAL COMPONENTS SHALL BE DESIGNED AND MANUFACTURED BY AN APPROVED FABRICATOR. DESIGN AND FABRICATION SHALL BE IN ACCORDANCE WITH THE CODES AND STANDARDS CITED IN THESE GENERAL STRUCTURAL NOTES, DRAWINGS, AND/OR CONTRACT SPECIFICATIONS. SUBMIT CALCULATIONS, DRAWINGS, AND MANUFACTURER'S DATA, SUFFICIENT TO DEMONSTRATE COMPLIANCE, TO THE ENGINEER FOR REVIEW. AFTER THE ENGINEER'S REVIEW, THE CONTRACTOR SHALL SUBMIT SAME TO THE BUILDING DEPARTMENT FOR APPROVAL. ALL COSTS AND TIME REQUIRED FOR DEFERED SUBMITTAL REVIEW AND APPROVAL SHALL BE INCLUDED IN THE CONTRACTOR'S BID.
2. CALCULATIONS AND DESIGN DRAWINGS FOR MANUFACTURED STANDARD PRODUCTS SHALL BE PREPARED AND SEALED BY AN ENGINEER REGISTERED IN ONE OF THE UNITED STATES, PROVIDED THAT THERE IS NO ALTERATION OF SIZE, MATERIAL, OR CODES/STANDARDS BETWEEN THE STANDARD DESIGN AND THAT PROPOSED FOR USE ON THIS PROJECT. ALTERNATIVELY, MANUFACTURED PRODUCTS MAY BEAPPROVED BY THE ICC. CALCULATIONS AND DRAWINGS FOR FABRICATED COMPONENTS, OR WHERE VARIATION IS PROPOSED FROM STANDARD SIZE, MATERIAL, OR CODES/STANDARDS, SHALL BE PREPARED AND SEALED BY AN ENGINEER REGISTERED IN THE STATE OF ARIZONA.
3. ITEMS REQUIRING DEFERED SUBMITTAL INCLUDE:
   A) PRE-CAST CONCRETE PRODUCTS (INCLUDING POYMER-CONCRETE).

ABBREVIATIONS

AS	AS SHOWN	IF	INSIDE FACE
AB	ANCHOR BOLT	L.P.	LOW POINT
BLDG	BUILDING	LONG	LONGITUDINAL
CJ	CONTRACTION JOINT CONSTRUCTION JOINT	MAX	MAXIMUM
		MIN	MINIMUM
CLR	CLEAR	MFR, MANUF	MANUFACTURER
CNR	CORNER	MCJ	MASONRY CONTROL JOINT
CONT	CONTINUOUS	(N)	NEW
CTR	CENTER	OF	OUTSIDE FACE
(E)	EXISTING	OH	OPPOSITE HAND
EA	EACH	OPP	OPPOSITE
EF	EACH FACE	PC	PIECE
EJ	EXPANSION JOINT	PL	PLATE
EL, ELEV	ELEVATION	RB	ROUND BAR
EQ, EQUIP	EQUIPMENT	SCH	SCHEDULE
EW	EACH WAY	SIM	SIMILAR
EXIST	EXISTING	SJ	SAWN JOINT
FAB	FABRICATED, FABRICATOR	STD	STANDARD
FB	FLAT BAR	STRUC	STRUCTURAL
FF	FINISHED FLOOR	T&B	TOP & BOTTOM
FG	FINISHED GRADE	TOC	TOP OF CONCRETE (CURB)
FJ	FORMED JOINT	TOM	TOP OF MASONRY
GB	GRADE BREAK	TOS	TOP OF STEEL
GSN	GENERAL STRUCTURAL NOTES	TOW	TOP OF WALL
H.P.	HIGH POINT	TRANSV	TRANSVERSE
H1E	(STANDARD) HOOK ONE END	TYP	TYPICAL
H2E	(STANDARD) HOOK TWO ENDS	UON	UNLESS OTHERWISE NOTED
HK, HKS	HOOK OR HOOKS	VERT	VERTICAL
HORIZ	HORIZONTAL		
HSS	HOLLOW STRUCTURAL SHAPE		

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Registered Professional Engineer
CERTIFICATE NO. 40290
CARL VILHELM HEERUP
Date Signed 06/23
HEERUP ENGINEERING
12825 W. Ballad Drive
Sun City West, AZ 85375
(602) 451-3275

GREELEY AND HANSEN
2800 N 44TH STREET, SUITE 650
PHOENIX, ARIZONA 85008

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CITY OF PHOENIX
WATER SERVICES DEPARTMENT

COLLECTIONS SYSTEMS
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GENERAL STRUCTURAL NOTES

CITY PROJECT NO. WS90400067

DATE: JANUARY 2023

SØ1 SHEET 21 OF 41

CAD FILE: 2159-S

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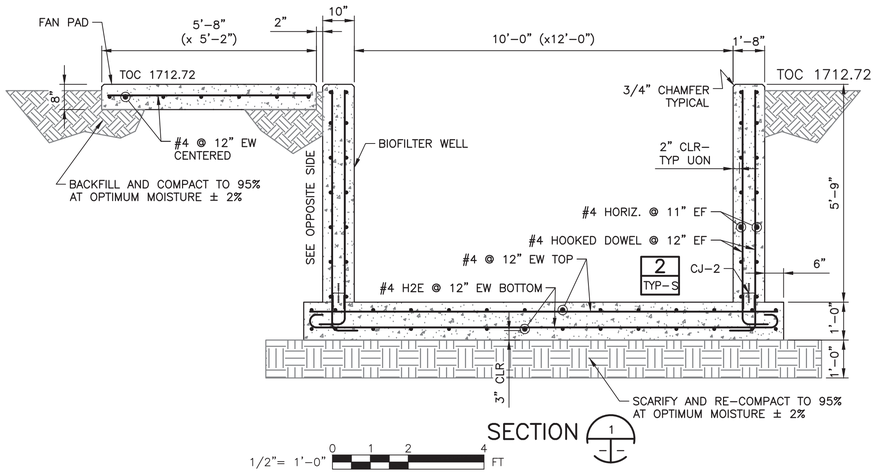

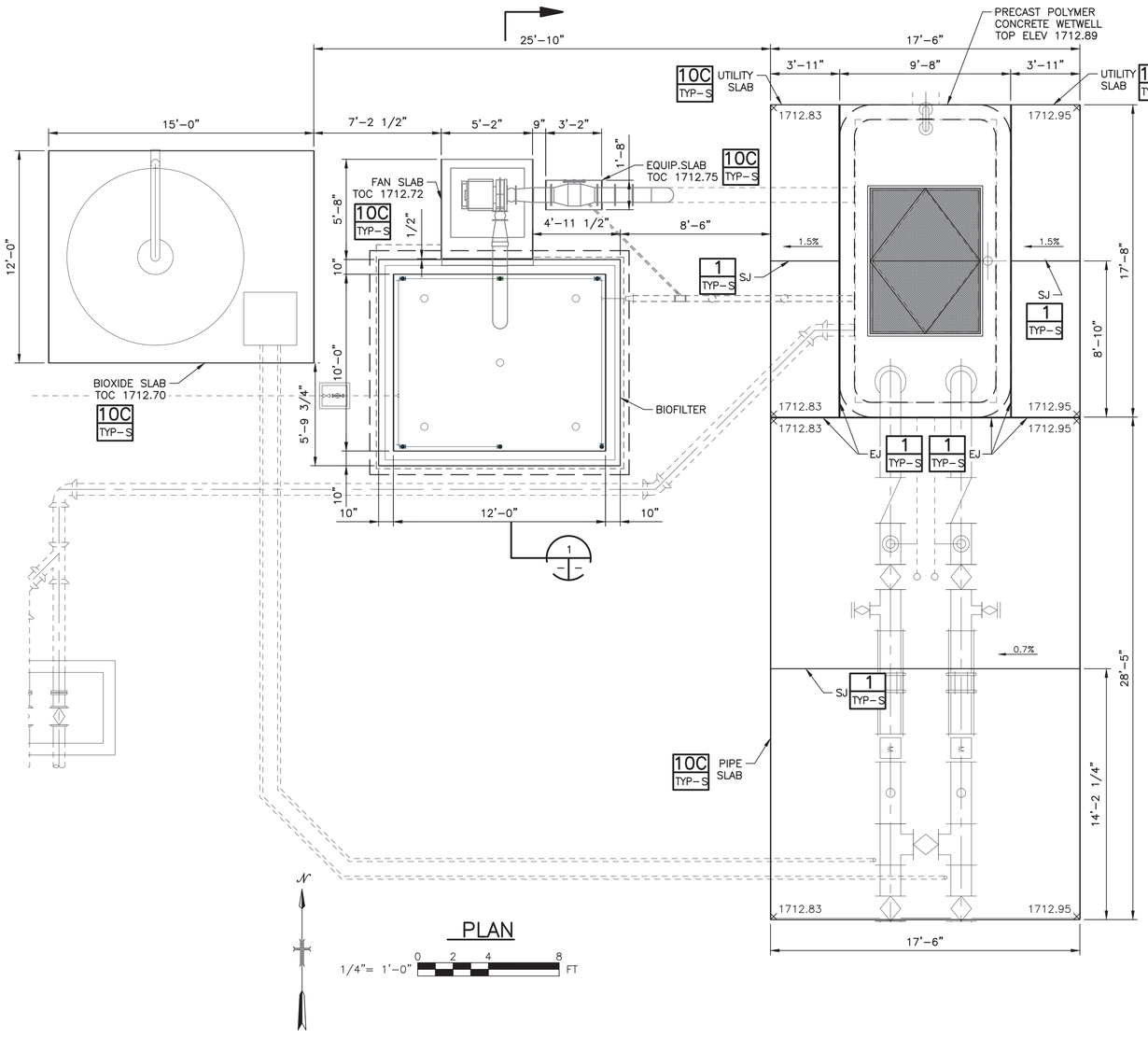

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Registered Professional Engineer (Mechanical) CERTIFICATE NO. 40290 CARL VILHELM HEERUP Date Signed 10/6/23

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(602) 451-3275

GREELEY AND HANSEN
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PLAN AND SECTION

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S02 SHEET 22 OF 41

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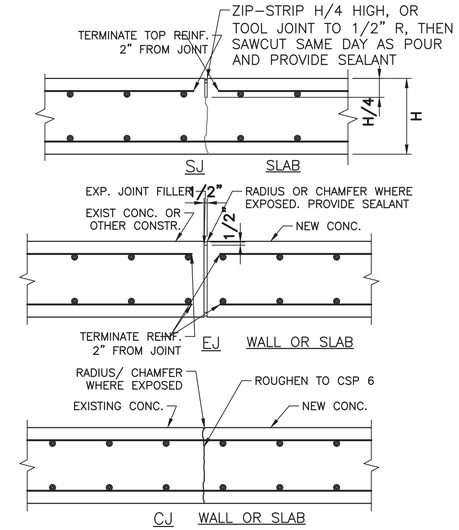

1 TYP-S **TYPICAL CONCRETE JOINTS**

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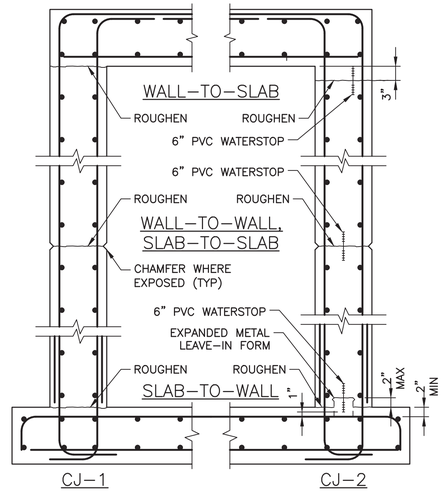

2 TYP-S **TYPICAL CONSTRUCTION JOINTS**

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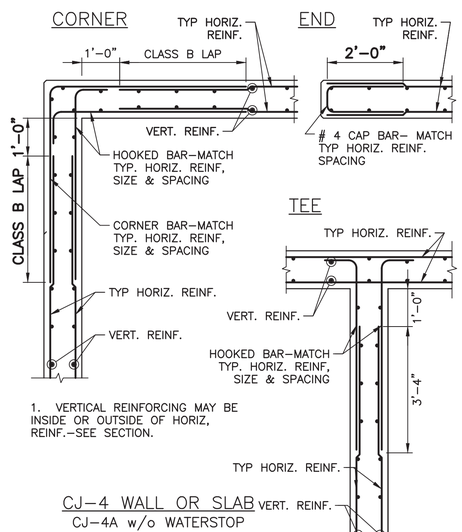

8 TYP-S **WALL INTERSECTIONS**

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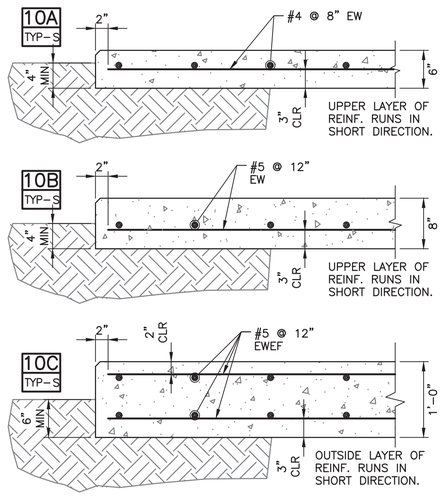

SEE GSN FOR SUBGRADE PREP.

10 TYP-S **TYPICAL SLABS**

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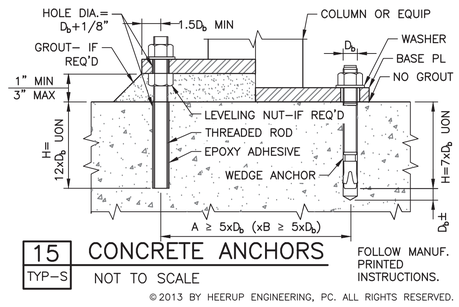
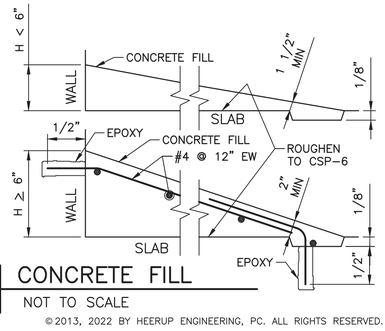


15 TYP-S **CONCRETE ANCHORS**

NOT TO SCALE

FOLLOW MANUF. PRINTED INSTRUCTIONS.



19 TYP-S **CONCRETE FILL**

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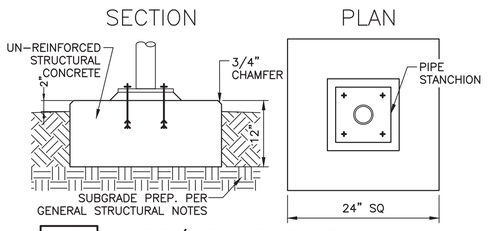

48 TYP-S **PIPE/ EQUIP SLAB**

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TYPICAL DETAILS

CITY PROJECT NO. WS90400067

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AREA CLASSIFICATIONS

	DESCRIPTION
DAMP	INDICATES THAT ALL ELECTRICAL EQUIPMENT AND MATERIALS INSTALLED WITHIN THE ROOM OR AREA IN WHICH THIS NOTATION APPEARS SHALL BE OF NEMA 12 CONSTRUCTION (OR GASKETED AND SUITABLE FOR USE IS A WET LOCATION WHERE NEMA STANDARDS DO NOT APPLY) UNLESS OTHER-WISE NOTED.
WET	INDICATES THAT ALL ELECTRICAL EQUIPMENT AND MATERIALS INSTALLED WITHIN THE ROOM OR AREA IN WHICH THIS NOTATION APPEARS SHALL BE OF NEMA 4X CONSTRUCTION (OR GASKETED AND SUITABLE FOR USE IN A WET LOCATION WHERE NEMA STANDARDS DO NOT APPLY) UNLESS OTHER-WISE NOTED.
CORROSIVE	INDICATES THAT ALL ELECTRICAL EQUIPMENT AND MATERIALS INSTALLED WITHIN THE ROOM OR AREA IN WHICH THIS NOTATION APPEARS SHALL BE OF NEMA 4X NON-METALLIC CONSTRUCTION (OR CORROSION RESISTANT CONSTRUCTION SUITABLE FOR USE IN A WET LOCATION WHERE NEMA STANDARDS DO NOT APPLY) UNLESS OTHERWISE NOTED.
CLASS 1, DIV. 1 GROUP D	INDICATES THAT ALL ELECTRICAL EQUIPMENT AND MATERIALS INSTALLED WITHIN THE ROOM OR AREA IN WHICH THIS NOTATION APPEARS SHALL CONFORM TO N.E.C. REQUIREMENTS FOR THE HAZARDOUS AREA CLAS-SIFICATION SHOWN.

BREAKERS

SINGLE LINE	PLAN	
52 XXXX / XXXX	——	DRAWOUT MEDIUM VOLTAGE POWER BREAKER UPPER NUMBER INDICATES LONG TIME TRIP SETTING LOWER NUMBER INDICATES BREAKER CONTINUOUS CURRENT RATING
XP XAT / XAF	CB	THERMAL-MAGNETIC CIRCUIT BREAKER TRIP RATING ABOVE; FRAME RATING BELOW. TYPICAL FOR OTHER TYPES OF BREAKERS. BREAKER TO BE 3 POLE UNLESS NOTED OTHERWISE AS 1P OR 2P
X / MCP, Z	J	COMBINATION MOTOR STARTER WITH MOTOR CIRCUIT PROTECTOR, MAGNETIC CONTACTOR AND OVERLOAD PROTECTION X= AMPERE SIZE Z= NEMA SIZE
Z	Z	MOTOR STARTER WITH MAGNETIC CONTACTOR AND OVERLOAD PROTECTION Z= NEMA SIZE

COMMUNICATION SYSTEMS

TTB	TELEPHONE TERMINAL BOARD 4FT X 8FT X 3/4 INCH UNLESS NOTED OTHERWISE
▼	TELEPHONE OUTLET, WALL TYPE (MOUNT 1'-6" AFF UNO)
▼	TELEPHONE OUTLET AND FLOOR BOX
▼	TELEPHONE/DATA OUTLET, WALL TYPE (MOUNT 1'-6" AFF UNO)
▼	TELEPHONE/DATA OUTLET AND FLOOR BOX
S C1	PAGING SPEAKER, WALL MOUNTED "H1" AND "C1" DENOTES TYPE. H=HORN, C=CONE
S H1	PAGING SPEAKER, WALL MOUNTED, BI-DIRECTIONAL NOTATIONS SAME AS ABOVE
S H3	
S C2	PAGING SPEAKER, FLUSH MOUNTED CEILING TYPE
S	PAGING STATION, SURFACE MOUNTED
VC	REMOTE WALL MOUNTED VOLUME CONTROL. FOR CEILING SPEAKER (MOUNT UP 5'-0" AFF UNO)
A	PAGING SPEAKER AMPLIFIER ASSEMBLY

CONDUIT

———	EXPOSED CONDUIT
- - - - -	UNDERGROUND DUCT BANK OR CONCEALED CONDUIT IN CONCRETE FLOOR, CEILING OR WALL UNLESS OTHERWISE INDICATED OR NOTED.
	INDICATES CONDUIT TURNING UP OR TOWARD THE VIEWER.
	INDICATES CONDUIT TURNING DOWN OR AWAY FROM THE VIEWER.
1000	CONDUITS IDENTIFIED BY A NUMBER SHALL BE LISTED IN THE CONDUIT SCHEDULES
AA	CONDUITS IDENTIFIED BY LETTERS SHALL CONFORM TO THE TABLES IN THE LEGEND
——∃	CONDUIT STUBBED OUT AND CAPPED
	FLEXIBLE CONDUIT OR MANUFACTURER'S CABLE(S)
	TEE FITTING IN CONDUIT

CONDUIT CONTINUED

	DESCRIPTION
XXXX ►	CONDUIT HOMERUN, XXX DENOTES DESTINATION CONTRACTOR SHALL FIELD ROUTE FROM EQUIPMENT TO DESIGNATED LOCATION
(2)-3"C, 3-#3/0, 1-#2G	DENOTES A QUANTITY OF TWO (2) 3-INCH CONDUITS EACH CONTAINING THREE NO. 3/0 AWG CONDUCTORS AND 1 NO. 2 AWG GROUND CONDUCTOR
2 PR #16 TWSH	DENOTES A QUANTITY OF TWO INSTRUMENT CABLES. EACH CABLE TO CONSIST OF TWO NO. 16 AWG CONDUCTORS TWISTED TOGETHER AND COVERED WITH A METALLIC SHIELD AND AN OVERALL PROTECTIVE JACKET. REFER TO THE SPECIFICATIONS FOR THE EXACT CABLE TO BE PROVIDED.
2 TR #16 TWSH	SAME AS ABOVE EXCEPT CABLE TO CONSIST OF THREE NO. 16 AWG CONDUCTORS TWISTED, SHIELDED AND COVERED WITH AN OVERALL PROTECTIVE JACKET. REFER TO THE SPECIFICATIONS FOR THE EXACT CABLE TO BE PROVIDED.
2 PR #16 TW	DENOTES A QUANTITY OF TWO INSTRUMENT CABLES. EACH CABLE TO CONSIST OF TWO NO. 16 AWG CONDUCTORS TWISTED TOGETHER AND AN OVERALL PROTECTIVE JACKET. REFER TO THE SPECIFICATIONS FOR THE EXACT CABLE TO BE PROVIDED.
(3)-4"C	THREE 4-INCH CONDUITS
——G——	BARE COPPER GROUNDING CONDUCTOR AWG #4/0 UNLESS NOTED OTHERWISE OR SPECIFIED

CONTROL DIAGRAM CONDUCTORS

	DESCRIPTION
	CONDUCTORS NOT CONNECTED
	CONDUCTORS CONNECTED
	CONDUCTOR SHIELD
	CONDUCTOR SHIELD TWISTED PAIR
	FIELD CONDUCTOR SHIELD
	FIELD CONDUCTOR SHIELD TWISTED PAIR
	EARTH GROUND
	CHASSIS GROUND
	NEUTRAL
	SEPARABLE CONNECTOR SIFICATION SHOWN.

CONTROL DIAGRAM COMPUTER CONTOL SYSTEM INPUT\OUTPUT

DI #	DISCRETE INPUT
DO #	DISCRETE OUTPUT
AI #	ANALOG INPUT
AO #	ANALOG OUTPUT

ELEMENTS

	RESISTOR OR RESISTIVE ELEMENT
	OVERLOAD RELAY THERMAL ELEMENT (HEATER)
	STRIP HEATER OR HEATING ELEMENT
/*	HIGH VOLTAGE, GROUP OPERATED, AIR-BREAK SWITCH * CONTINUOUS AMPERE RATING

EQUIPMENT

SINGLE LINE	PLAN	
UH-_ _KW	UH-	UNIT HEATER NO. 1
WH-_ _KW	WH-	WATER HEATER NO. 1
DAMPER	DM	DAMPER MOTOR
MOV	MOV	MOTOR OPERATED VALVE "XXXX" DENOTES LOOP NUMBER TO BE OBTAINED FROM INSTRUMENTATION DRAWINGS
HH	HH	HAND HOLE
——	RCS	REMOTE CONTROL STATION
ITP	ITP	INTERMEDIATE TERMINAL PANEL

FIRE ALARM SYSTEMS

	DESCRIPTION
TYPE R	FIRE ALARM HEAT DETECTOR 135Y FIXED TEMPERATURE UNLESS OTHER- WISE NOTED. "200" DENOTES 200YF TYPE, "R" DENOTES FIXED TEMPERATURE RATE-OF-RISE TYPE.
I 2	FIRE ALARM DUCT SMOKE DETECTOR PHOTOCELL TYPE UNLESS OTHERWISE NOTED: "I" DENOTES IONIZATION TYPE.
2	FIRE ALARM DUCT SMOKE DETECTOR
FACP-	FIRE ALARM CONTROL PANEL NO. 1
FAVP-	FIRE ALARM VENTILATION PANEL NO. 1 (WITH GRAPHIC PANEL)
FARAP-	FIRE ALARM REMOTE ANNUNCIATOR NO. 1
M WP	FIRE ALARM MANUAL PULL STATION, MOUNT UP 4'-0" WP DENOTES WEATHERPROOF COVER
F	OUTDOOR WEATHERPROOF FIRE ALARM MASTER BOX
F	WP FIRE ALARM SPEAKER, MOUNT UP 7'-8"
S	FIRE ALARM STROBE, WALL MOUNT UP 6'-8" OR AT CEILING
F	FIRE ALARM HORN AND STROBE LIGHT COMBINATION, MOUNT UP 6'-8"
F	FIRE ALARM HORN AND STROBE LIGHT COMBINATION, CEILING MOUNT
	SPRINKLER VALVE SUPERVISORY SWITCH
F	FIRE ALARM BELL
FB	WEATHERPROOF HI-DENSITY FIRE ALARM STROBE LIGHT
	SPRINKLER FLOW ALARM SWITCH
CM	ADDRESSABLE CONTROL MODULE
MM	ADDRESSABLE MONITOR MODULE
SD	SMOKE DETECTOR

GROUNDING

SINGLE LINE	PLAN	
		GROUND ROD
——		GROUND ROD IN GROUNDING WELL
——		GROUND ROD IN TEST WELL
——		GROUND GRID CABLE CONNECTION, WELDED

LIGHTING

$a	SINGLE POLE SWITCH "a" INDICATES SWITCHLEG SHALL CONTROL LUMINAIRES WITH "a" DESIGNATION
$2 b	DOUBLE POLE SWITCH "b" INDICATES SWITCHLEG SHALL CONTROL LUMINAIRES WITH "b" DESIGNATION
$3 c	THREE WAY SWITCH "c" INDICATES SWITCHLEG SHALL CONTROL LUMINAIRES WITH "c" DESIGNATION
$4 d	FOUR WAY SWITCH "d" INDICATES SWITCHLEG SHALL CONTROL LUMINAIRES "d" DESIGNATION
$M	SINGLE POLE, DOUBLE THROW MOMENTARY CONTACT SWITCH, CENTER OFF
$P	SINGLE POLE SWITCH AND PILOT LIGHT
PB	PULL BOX
PB	
Ca	LIGHTING CONTACTOR WITH NUMBER OF POLES AS INDICATED a-CONTACTOR NUMBER (C1, C2, ETC.)
ALCP-X OR	ALP-X AREA LIGHTING CONTACTOR PANEL X= PANEL NAME
TM	TIME SWITCH
LP-X OR	LP-X LIGHTING PANELBOARD NO. X (240/120V OR 208/120V) X= PANELBOARD NAME
PP-X OR	PP-X POWER DISTRIBUTION PANELBOARD NO. X (480V OR 480/277V) X= PANELBOARD NAME
XX X Y b NL	TYPICAL LUMINAIRES SEE SCHEDULE FOR SPECIFICS "XX"-FIXTURE TYPE X= PANELBOARD NAME "b"-CONTROLLED BY Y= CIRCUIT NUMBER SWITCH "b" NL= NIGHT LIGHT (UNSWITCHED)
XX NL X Y b	FLUORESCENT TYPE LUMINAIRES. SEE SCHEDULE FOR SPECIFICS. NOTATIONS SAME AS ABOVE.

LIGHTING CONTINUED

XX X Y a NL	FLUORESCENT TYPE LUMINAIRES. SEE SCHEDULE FOR SPECIFICS. NOTATIONS SAME AS ABOVE.
TYPE	INDICATES ALL LUMINAIRES WITHIN THE ROOM OR AREA IN WHICH THIS NOTATION APPEARS SHALL BE TYPE "A" UNLESS OTHERWISE NOTED. SEE LIGHTING FIXTURE SCHEDULE FOR TYPES
R	ALARM BEACON. COLOR AS NOTED. SEE SPECIFICATIONS FOR REQUIREMENTS.
E1 LP-X Y	EMERGENCY LUMINAIRES WITH BATTERY PACK "E1" FIXTURE TYPE. SEE SCHEDULE FOR SPECIFICS. X= PANELBOARD NAME Y= CIRCUIT NUMBER
REM	REMOTE EMERGENCY LUMINAIRES "E2"-FIXTURE TYPE. SEE SCHEDULE FOR SPECIFICS
X1 LP-3 Y *	CEILING MOUNTED EXIT SIGN "X1" LUMINAIRE TYPE. SEE SCHEDULE FOR SPECIFICS X= PANELBOARD NAME Y= CIRCUIT NUMBER * SP= SELF POWERED
X2 LP-X Y *	WALL OUTLET EXIT SIGN. ARROW INDICATES DIRECTION OF EXCESS "X2" LUMINAIRE TYPE. SEE SCHEDULE FOR SPECIFICS. X= PANELBOARD NAME Y= CIRCUIT NUMBER * SP= SELF POWERED
	INFARED LIGHT

MISCELLANEOUS

SINGLE LINE	PLAN	
	——	CONDUCTORS OR CONDUITS CROSSING PATHS BUT NOT CONNECTED
	——	CONDUCTORS ELECTRICALLY CONNECTED
	——	INDICATES LIMITS OF EQUIPMENT OR WIRING ENCLOSURE
FU# AMPS	——	FUSE, AMPERE RATING AS NOTED
FU# AMPS	——	FUSE DISCONNECT
	——	INDUCTOR
K	——	KEY INTERLOCK
E K	——	ELECTRONIC KEY INTERLOCK
	——	CORD AND PLUG CONNECTION.
T	——	THERMOSTAT
OS	——	OCCUPANCY SENSOR
PC	——	PHOTOCELL
ESA	——	EMERGENCY SHOWER ALARM STATION
	——	SINGLE FACE CLOCK AND CLOCK HANGER OUTLET
		JUMPER (OPTION 1)
		JUMPER (OPTION 2)
XXX		MOTOR SWITCH
		DEMOLITION

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FACILITY DRAWINGS
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FOR CITY OF PHOENIX USE ONLY - REFERENCE CID NUMBER: #

REVISION	ENGINEERING COMPANY	PROJECT NO.	PROJECT NAME	DATE	CAD FILE NAME	DWG NUMBER	REMARKS

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JOSEPH E
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REVISIONS				
NO.	BY	DATE	CKD	REMARKS

DES LC
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CKD DA

City of Phoenix

CITY OF PHOENIX
WATER SERVICES DEPARTMENT
COLLECTION SYSTEMS
REMOTE FACILITIES

ELECTRICAL

LIFT STATION 76 PHASE II EXPANSION
LEGEND 1

CITY PROJECT NO. WS90400067
DATE: MAY 2023
E01 SHEET 24 OF 41
CAD FILE: 04276.05_E01

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100% SUBMITTAL

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POWER SWITCHES

SINGLE LINE	PLAN	DESCRIPTION
*		NON-FUSIBLE DISCONNECT SWITCH, 600 VOLT, 3 POLE, * AMPERE RATING
*	F	FUSIBLE DISCONNECT SWITCH, 600 VOLT, 3 POLE, AMPERE RATING AND FUSE SIZE AS NOTED *AMPERE RATING *FUSE RATING
	P 2	MANUAL MOTOR STARTER WITH THERMAL OVERLOAD PROTECTION "P" INDICATES WITH PILOT LIGHT "2" INDICATES NUMBER OF POLES
		DRAWOUT TYPE EQUIPMENT OR DEVICE
		MEDIUM VOLTAGE CABLE TERMINATION
		MEDIUM VOLTAGE AIR INTERRUPTER SWITCH
		MEDIUM VOLTAGE FUSED AIR INTERRUPTER SWITCH
#		MEDIUM VOLTAGE FUSED MOTOR CONTROLLER *AT=AUTOTRANSFORMER TYPE
TAG KVA PRIMARY SECONDARY PHASE	T	TRANSFORMER, RATINGS AND CONNECTIONS AS NOTED. UNLESS OTHERWISE NOTED ON THE ONE LINE DIAGRAMS ALL DRY TYPE TRANSFORMERS SERVICING ADMINISTRATIVE AND LABORATORY SPACES SHALL HAVE A K FACTOR OF 13. ALL OTHER DRY TYPE TRANSFORMERS SHALL HAVE A K-4 RATING. ISOLATION TRANSFORMERS SHALL HAVE A K-20 RATING
M * *		METER * WM-WATTMETER WHM-WATTHOUR METER WHDM-WATTHOUR DEMAND METER WHDR-WATTHOUR DEMAND RECORDER PF-POWER FACTOR METER TRANSDUCER * AX-CURRENT TRANSDUCER WX-WATT TRANSDUCER
XX/XX (*) CT		CURRENT TRANSFORMER *QUANTITY XXXX = PRIMARY AMPERE RATING
XX/XX (*) **		POTENTIAL TRANSFORMER (PT) OR CONTROL POWER TRANSFORMER (CPT) *QUANTITY XXXX = PRIMARY VOLTAGE RATING
G#		GENERATOR WITH GENERATION NUMBER, RATINGS AND CONNECTIONS AS NOTED IN CALL-OUT ON DRAWING
RATE ATS-#	ATS-#	AUTOMATIC TRANSFER SWITCH (ATS) "N" INDICATES NORMAL SOURCE "S" INDICATES STANDBY SOURCE "RATE" INDICATES CONTINUOUS CURRENT RATING "#" INDICATES ATS NAME
VFD	VFD	AC MOTOR SPEED CONTROLLER (VARIABLE FREQUENCY DRIVE)
SCR	SCR	DC MOTOR SPEED CONTROLLER (SILICON CONTROLLED RECTIFIER)
#	MTR	MOTOR, NUMERAL INDICATES HORSEPOWER
VS VM *		VOLTMETER WITH SWITCH, 3 PHASE * = SCALE
VS AM *		AMMETER WITH SWITCH, 3 PHASE * = SCALE
LA		LIGHTNING ARRESTOR
		SURGE SUPPRESSER
TVSS	TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR (POWER DISTRIBUTION TYPE)
TAGNUMBER		PILOT LIGHT, COLOR AS NOTED A-AMBER, B-BLUE, C-CLEAR G-GREEN, R-RED, W-WHITE
*		SPECIAL CAPACITOR *SC-SURGE CAPACITOR PR-POWER FACTOR CORRECTION CAPACITOR
		CONTROL STATION (STANDMOUNT OR WALLMOUNT) SEE SCHEMATIC DIAGRAMS AND/OR INSTRUMENTATION DIAGRAMS FOR TYPE AND QUANITY OF OPERATORS.
TAGNUMBER	TAGNUMBER OR SV	SOLENOID OPERATED VALVE
ETM		ELAPSED TIME METER

PUSH BUTTONS

SINGLE LINE	DESCRIPTION
X X # (X)	PUSHBUTTON, MOMENTARY CONTACT, SPRING RETURN, NORMALLY CLOSED
X X # (X)	PUSHBUTTON, MOMENTARY CONTACT, SPRING RETURN, NORMALLY OPEN
X X # (X)	START-STOP PUSHBUTTON CONTROL STATION, MAINTAINED CONTACT WITH LOCKOUT DEVICE ON STOP
X X A B # XO (X)	2 POSITION SELECTOR SWITCH, NORMALLY CLOSED
X X A B # XO (X)	2 POSITION SELECTOR SWITCH, NORMALLY OPEN
X X A B # XO OX (X)	2 POSITION 2 POLE SELECTOR SWITCH
X X LOCAL COMPUTER # XO OX OX (X)	2 POSITION 3 POLE SELECTOR SWITCH
X X A B C # XOO (X)	3 POSITION SELECTOR SWITCH, NORMALLY CLOSED
X X A B C # XOO (X)	3 POSITION SELECTOR SWITCH, NORMALLY OPEN
X X A B C # XOO OXO OOX (X)	3 POSITION 3 POLE SELECTOR SWITCH
X X A B C D # XOOO (X)	4 POSITION SELECTOR SWITCH, NORMALLY OPEN

PUSH BUTTONS CONT.

DESCRIPTION	
EMERGENCY STOP PUSHBUTTON WITH RED MUSHROOM HEAD OPERATOR (MAINTAINED CONTACT)	X X A B C D # XOOO (X)
	4 POSITION SELECTOR SWITCH, NORMALLY CLOSED
	X X A B C D # XOOO OXOO OOXO OOOX (X)
	4 POSITION 4 POLE SELECTOR SWITCH

RELAY CONTACTS

X X CR XX XX # (X)	MOTOR STARTER, TIMING, OR CONTROL RELAY COIL NUMBER AS INDICATED
X X TD ON/OFF DELAY RUNG1 RED RUNG2 RED # (X)	0-## MIN
X X XX XX # (X)	NORMALLY OPEN RELAY CONTACT
X X XX XX # (X)	NORMALLY CLOSED RELAY CONTACT
X X # (X)	NOTC-NORMALLY OPEN TIMED CLOSING, WHEN ENERGIZED
X X # (X)	NCTO-NORMALLY CLOSED TIMED OPENING, WHEN ENERGIZED
X X # (X)	NOTO-NORMALLY OPEN, TIMED OPENING WHEN DE-ENERGIZED
X X # (X)	NCTC-NORMALLY CLOSED, TIMED CLOSING WHEN DE-ENERGIZED

SWITCH CONTACTS

SINGLE LINE	
TAGNUMBER OR	FIELD MOUNTED INSTRUMENT X= DESIGNATION TO BE OBTAINED FROM INSTRUMENTATION DRAWINGS 0000= LOOP NUMBER TO BE OBTAINED FROM INSTRUMENTATION DRAWINGS
XO	AUXILLARY SWITCH CONTACT NORMALLY CLOSED
XO	AUXILLARY SWITCH CONTACT NORMALLY OPEN

SWITCH CONTACTS CONT.

SINGLE LINE	
X X # (X)	NORMALLY OPEN SWITCH
X X # (X)	NORMALLY CLOSED SWITCH
X X # (X)	LIQUID LEVEL (FLOAT) NORMALLY CLOSED, OPENS ON RISING LEVEL
X X # (X)	LIQUID LEVEL (FLOAT) SWITCH NORMALLY OPEN, CLOSES ON RISING LEVEL
X X # (X)	PRESSURE SWITCH NORMALLY OPEN, CLOSES ON RISING PRESSURE
X X # (X)	PRESSURE SWITCH NORMALLY CLOSED, OPENS ON DROPPING PRESSURE
X X V # (X)	VACUUM SWITCH NORMALLY OPEN, CLOSES ON RISING PRESSURE
X X V # (X)	VACUUM SWITCH NORMALLY CLOSED, OPENS ON DROPPING PRESSURE
X X # (X)	DIFFERENTIAL PRESSURE SWITCH NORMALLY OPEN, CLOSES ON RISING DIFFERENTIAL PRESSURE
X X # (X)	DIFFERENTIAL PRESSURE SWITCH NORMALLY CLOSED, OPENS ON RISING DIFFERENTIAL PRESSURE
X X # (X)	TEMPERATURE SWITCH NORMALLY OPEN, CLOSES ON RISING TEMPERATURE
X X # (X)	TEMPERATURE SWITCH NORMALLY CLOSED, OPENS ON RISING TEMPERATURE
X X # (X)	FLOW SWITCH (AIR, WATER, ETC.,) NORMALLY OPEN, CLOSES ON INCREASED FLOW
X X # (X)	FLOW SWITCH (AIR, WATER, ETC.,) NORMALLY CLOSED, OPENS ON INCREASED FLOW
X X # (X)	POSITION (LIMIT) SWITCH NORMALLY OPEN
X X # (X)	POSITION (LIMIT) SWITCH NORMALLY CLOSED

SWITCH CONTACTS CONT.

SINGLE LINE	
X X # (X)	POSITION (LIMIT) SWITCH NORMALLY OPEN-HELD CLOSED
X X # (X)	POSITION (LIMIT) SWITCH NORMALLY CLOSED-HELD OPEN
X X # (X)	TORQUE SWITCH NORMALLY OPEN, CLOSES ON HIGH TORQUE
X X # (X)	TORQUE SWITCH NORMALLY CLOSED, OPENS ON HIGH TORQUE
X X * # (X)	PUSH-TEST, 110V S6 LAMP UNLESS NOTED, LETTER IS LENS COLOR * R-RED G-GREEN B-BLUE

RECEPTACLES

* LP-X Y	208V, 3P, 4W, RECEPTACLE *AMPERE RATING AS NOTED X= PANELBOARD NUMBER Y= CIRCUIT NUMBER
LP-X Y	COMBINATION 20A, 120V, 2P, 3W DUPLEX AND 20A, 240V, 2P,3W SINGLE RECEPTACLES UNDER COMMON PLATE X= PANELBOARD NUMBER Y= CIRCUIT NUMBER
LP-X Y	DOUBLE RECEPTACLE (QUAD), 20A, 120V, 2P, 3W MOUNTED IN 2 GANG BOX. X= PANELBOARD NUMBER Y= CIRCUIT NUMBER
*	240V, 20, 3W, RECEPTACLE *AMPERE RATING AS NOTED
	MULTI-OUTLET ASSEMBLY
TYPE	FLOOR OUTLET BOX WITH TYPE OUTLET INDICATED
* LP-X Y	480V, 3P, 4W RECEPTACLE AND DISCONNECT SWITCH *AMPERE RATING AS NOTED X= PANELBOARD NUMBER Y= CIRCUIT NUMBER
* LP-X Y	DUPLEX RECEPTACLE, 20A, 120V, 2P, 3W UNLESS OTHERWISE NOTED * C-MOUNTED ABOVE COUNTER-TOP GF- GROUND FAULT INTERRUPTER TYPE WP-WEATHERPROOF T-TRANSIENT VOLTAGE SURGE SUPPRESSER X= PANELBOARD NUMBER Y= CIRCUIT NUMBER
* ** LP-X Y	240V, 3P, 4W, RECEPTACLE **AMPERE RATING AS NOTED *WP= WEATHER PROOF XP= EXPLOSION PROOF X= PANELBOARD NUMBER Y= CIRCUIT NUMBER

SECURITY SYSTEMS

DS	SECURITY SYSTEM DOOR OR SWITCH
WS	SECURITY SYSTEM WINDOW SWITCH
KP	SECURITY SYSTEM KEY PAD
CR	SECURITY SYSTEM CARD ACCESS READER
GB	GLASS BREAK DETECTOR
MD	SECURITY ALARM MOTION DETECTOR
CCTV	CLOSED CIRCUIT TV CAMERA
PTZ	PAN, TILT, ZOOM CAMERA LENS CONTROLS

FACILITY DRAWINGS
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REVISION	ENGINEERING	PROJECT NO.	PROJECT NAME	DATE	CAD FILE NAME	DWG NUMBER	REMARKS

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NO.	BY	DATE	CKD	REMARKS

DES LC
DWN MV
CKD DA

City of Phoenix

CITY OF PHOENIX
WATER SERVICES DEPARTMENT
COLLECTION SYSTEMS
REMOTE FACILITIES

ELECTRICAL

LIFT STATION 76 PHASE II EXPANSION
LEGEND 2

CITY PROJECT NO. WS90400067
DATE: MAY 2023
E02 SHEET 25 OF 41
CAD FILE: 04276.05_E02

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AREA CLASSIFICATION SCHEDULE

BUILDING OR STRUCTURE	AREA	CLASSIFICATION	EXTENTS	ENVIRONMENT	REMARKS
OUTDOORS	OUTDOOR SPACE	CORROSIVE	WITHIN BOUNDS OF LIFT STATION	WET	
WET WELL	WET WELL	CLASS I, DIV 1, GROUP D	INSIDE WET WELL	WET, CORROSIVE	
THE SPACE ENCLOSED WITHIN 3 FEET OF THE TOP OF WET WELL		CLASS I, DIV 2, GROUP D			

3W	THREE WAY
4W	FOUR WAY

A

AMP	AMPERE
A/C	AIR CONDITIONING
AB	ANCHOR BOLT
AC	ALTERNATING CURRENT
AFD	ADJUSTABLE FREQUENCY DRIVE
AFF	ABOVE FINISH FLOOR
AFG	ABOVE FINISH GRADE
AHU	AIR HANDLING UNIT
AI	ANALOG INPUT
AL	ALUMINUM
ALCP	AREA LIGHTING CONTACTOR PANEL
AO	ANALOG OUTPUT
ATC	AUTOMATIC TEMPERATURE CONTROL
ATS	AUTOMATIC TRANSFER SWITCH
AUTO	AUTOMATIC
AUX	AUXILIARY
AWG	AMERICAN WIRE GAUGE CURRENT

B

BCP	BLOWER CONTROL PANEL
BLDG	BUILDING
BTU	BRITISH THERMAL UNIT

C

CB	CIRCUIT BREAKER
CKT	CIRCUIT
CLF	CURRENT LIMITING FUSE
CND	CONDUIT
COMB	COMBINATION
COND	CONDUCTIVITY
CPT	CONTROL POWER TRANSFORMER
CR	CONTROL RELAY
CS	CONTROL SWITCH
CT	CURRENT TRANSFORMER
CU	COPPER

D

DC	DIRECT CURRENT
DI	DIGITAL INPUT
DIA	DIAMETER
DIM	DIMENSION
DIV	DIVISION
DN	DOWN
DO	DIGITAL OUTPUT
DS	DISCONNECT SWITCH

E

EC	EMPTY CONDUIT
EGC	EQUIPMENT GROUNDING CONDUCTOR
EHH	ELECTRICAL HANDHOLE
EL	ELEVATION
ELEC	ELECTRICAL
EMERG	EMERGENCY
EMH	ELECTRICAL MANHOLE
EP	ELECTROPNEUMATIC

F

FBO	FURNISHED BY OTHERS
FE	FLOW ELEMENT
FIT	FLOW INDICATING TRANSMITTER
FT	FEET/FOOT
FU	FUSE
FUT	FUTURE
FURN	FURNISHED
FVR	FULL VOLTAGE REVERSING
FVNR	FULL VOLTAGE NON-REVERSING

G

GEC	GROUNDING ELECTRODE CONDUCTOR
GEN	GENERATOR
GFI	GROUND FAULT INTERRUPTER
GND	GROUND
GRS	GALVANIZED RIGID STEEL

H

HGT	HEIGHT
HH	HANDHOLE
HP	HORSEPOWER
HTR	HEATER
Hz	HERTZ

I

I	INSTRUMENTATION
IHH	INSTRUMENTATION HANDHOLE
IMH	INSTRUMENTATION MANHOLE
IN	INCH
INST	INSTANTANEOUS
INSTR	INSTRUMENT
ISW	INSTRUMENT ISOLATION SWITCH
ITP	INTERMEDIATE TERMINATION PANEL

L

L	LINE
LA	LIGHTNING ARRESTER
LCP	LOCAL CONTROL PANEL
LD	LEAK DETECTOR
LP	LIGHTING PANEL
LSIG	LONG-TIME SHORT-TIME INSTANTANEOUS GROUND FAULT

41

M

MAX	MAXIMUM
MCC	MOTOR CONTROL CENTER
MCP	MOTOR CIRCUIT PROTECTOR
MFR	MANUFACTURER
MH	MANHOLE
MIN	MINIMUM
MOV	MOTOR OPERATED VALVE
MPR	MOTOR PROTECTION RELAY
MS	MOTOR STARTER
MTD	MOUNTED

N

N	NEUTRAL
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRIC CODE
NO	NORMALLY OPEN
NTS	NOT TO SCALE
NUM	NUMBER

O

OC	ON CENTER
OL	OVERLOAD

P

PB	PULL BOX
PD	PLATE DESIGNATION
PF	POWER FACTOR
PFM	POWER FACTOR METER
PH	PHASE
PNL	PANEL
PP	POWER PANEL
PR	PAIR
PT	POTENTIAL TRANSFORMER

R

RCS	REMOTE CONTROL STATION
RECEPT	RECEPTACLE
RVA	REDUCE VOLTAGE AUTOTRANSFER
RVNR	REDUCE VOLTAGE NON-REVERSING

S

SC	SURGE CAPACITOR
SCR	SEMICONDUCTOR CONTROLLED RECTIFIER
SN	SOLID NEUTRAL
SV	SOLENOID VALVE
SSRV	SOFT START REDUCED VOLTAGE
ST	SPEED TACHOMETER
SW	SWITCH
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR

T

TFR	TRANSFORMER
TDC	TIME DELAY ON CLOSING
TDD	TIME DELAY AFTER DEENERGIZATION-OFF
TDE	TIME DELAY ENERGIZATION-ON DELAY
TDO	TIME DELAY ON OPENING
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
TWSH	TWISTED SHIELDED
TW	TWISTED

U

UPS	UNINTERRUPTABLE POWER SUPPLY

V

V	VOLTS
VFD	VARIABLE FREQUENCY DRIVE

W

W	WATTS
WHDM	WATT-HOUR DEMAND METER
WHDR	WATT-HOUR DEMAND
WHM	RECORDER WATT-HOUR METER
WM	WATT METER
WP	WATER PROOF
WX	WATT TRANSDUCER

X

XFMR	TRANSFORMER

Z

ZD	CIRCUIT BREAKER AUXILIARY CONTACT
ZM	ISOLATION SWITCH AUXILIARY CONTACT

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FACILITY DRAWINGS
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REVISION	ENGINEERING COMPANY	PROJECT NO.	PROJECT NAME	DATE	CAD FILE NAME	DWG NUMBER	REMARKS

Registered Professional Engineer
CERTIFICATE NO.
77484
JOSEPH E DINKEL
Date Signed
ARIZONA, U.S.A.

GREELEY AND HANSEN
2800 N. 44TH STREET, SUITE 650
PHOENIX, AZ 85008

REVISIONS				
NO.	BY	DATE	CKD	REMARKS

DES LC
DWN MV
CKD DA

City of Phoenix

CITY OF PHOENIX
WATER SERVICES DEPARTMENT
COLLECTION SYSTEMS
REMOTE FACILITIES

ELECTRICAL

LIFT STATION 76 PHASE II EXPANSION
ABBREVIATIONS AND AREA CLASSIFICATION

CITY PROJECT NO. WS90400067

DATE: MAY 2023

E03 SHEET 26 OF 41

CAD FILE: 04276.05_E03

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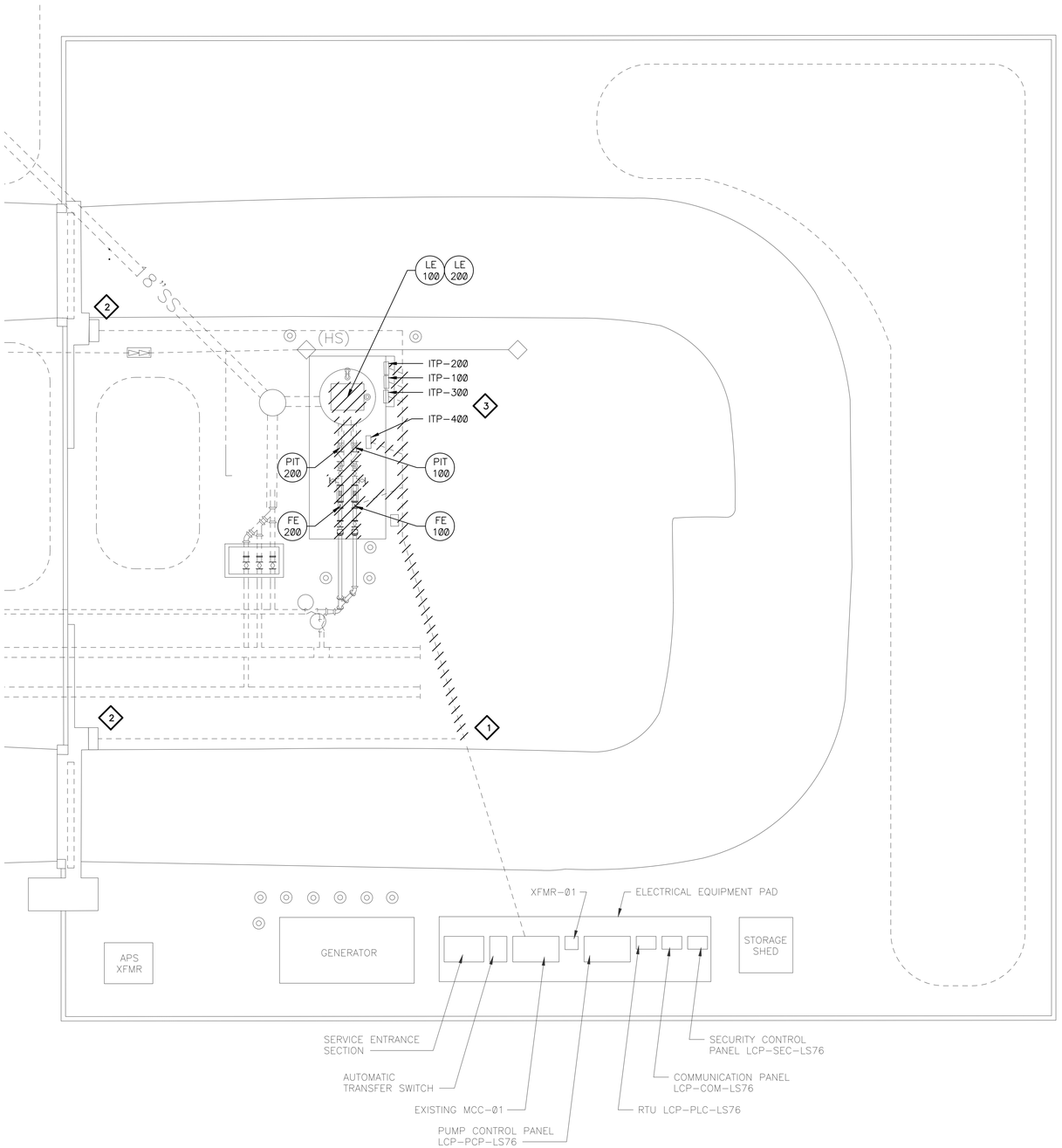

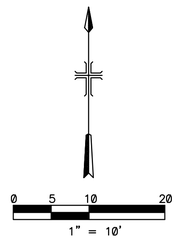

KEY NOTES:

1. DEMOLISH CONDUITS ASSOCIATED WITH WET WELL PUMPS POWER AND CONTROL UP TO THIS POINT. USE EXISTING CONDUITS TO FEED NEW PUMPS POWER AND CONTROL FOR NEW RELOCATED WET WELL.
2. NORTH AND SOUTH SECURITY GATE OPERATORS TO REMAIN IN SERVICE DURING DEMOLITION, PROVIDE TEMPORARY CONNECTION FOR POWER AND CONTROL UNTIL NEW PUMP SYSTEM IS INSTALLED AND AVAILABLE TO BE PUT INTO SERVICE.
3. RELOCATE EXISTING ITP'S TO NEW WET WELL AS SHOWN ON ELECTRICAL SITE PLAN.
4. RETURN SALVAGED ITEMS TO THE CITY OF PHOENIX.

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2800 N. 44TH STREET, SUITE 650
PHOENIX, AZ 85008

REVISIONS				
NO.	BY	DATE	CKD	REMARKS

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City of Phoenix

CITY OF PHOENIX
WATER SERVICES DEPARTMENT
ELECTRICAL SITE PLAN DEMOLITION
REMOTE FACILITIES

ELECTRICAL
LIFT STATION 76 PHASE II EXPANSION
ELECTRICAL SITE PLAN DEMOLITION

CITY PROJECT NO. WS90400067
DATE: MAY 2023
E04 SHEET 27 OF 41
CAD FILE: 04276.05_E04

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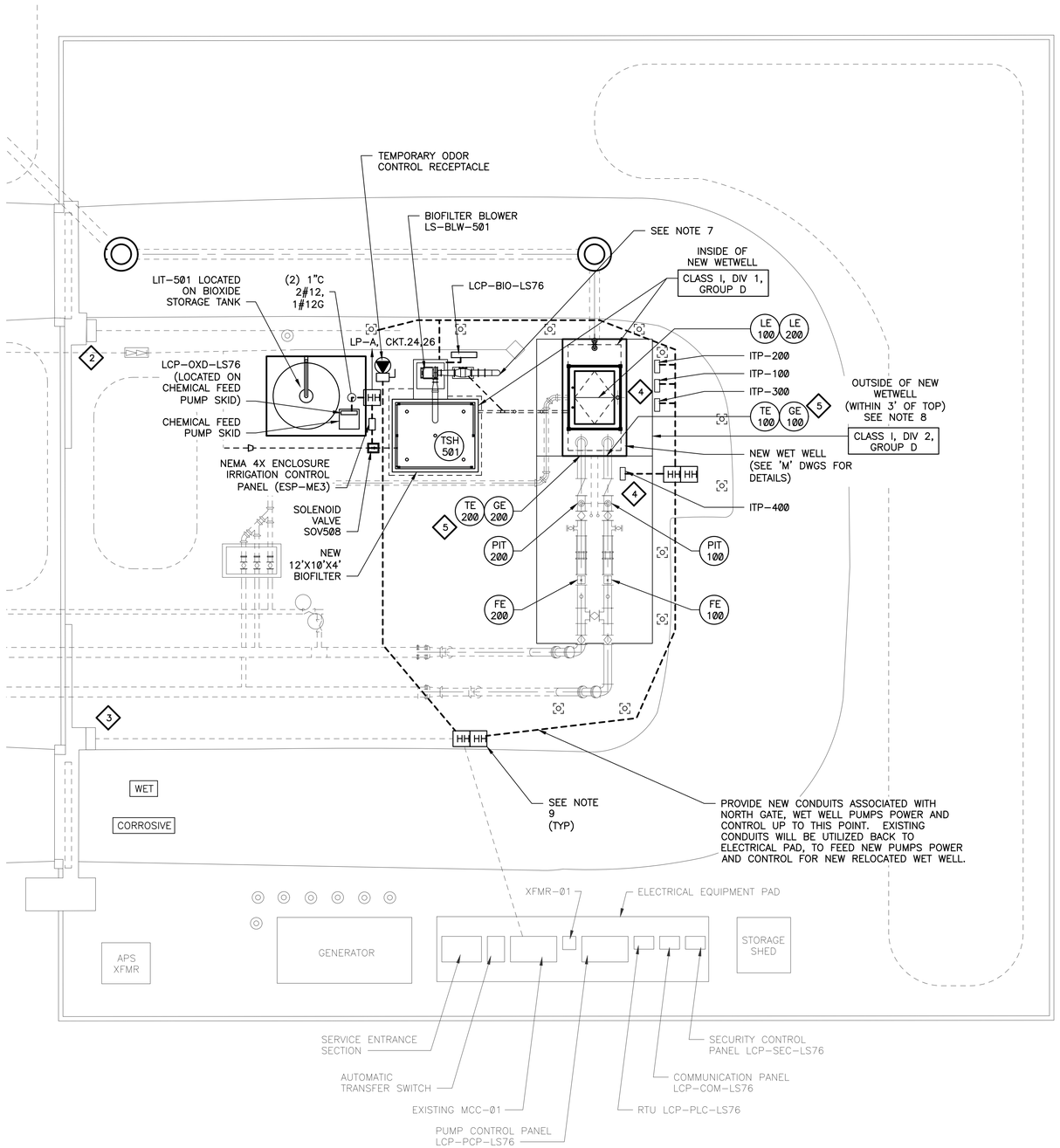

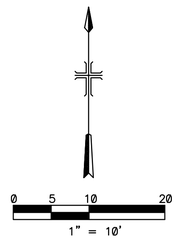

KEY NOTES:

1. PROVIDE NEW CONDUIT TO EXISTING NORTH GATE FROM EXISTING SECURITY CONTROL PANEL.
2. RECONNECT NORTH GATE CONTROL ONCE PUMP SYSTEM HAS BEEN INSTALLED AND PUT BACK INTO SERVICE. UTILIZE EXISTING CONDUITS AS NEEDED.
3. RECONNECT SOUTH GATE CONTROL ONCE PUMP SYSTEM HAS BEEN INSTALLED AND PUT BACK INTO SERVICE. UTILIZE EXISTING CONDUITS AS NEEDED.
4. DISCONNECT AND RELOCATE EXISTING ITP'S AS SHOWN AT NEW WET WELL. PROVIDE NEW CONDUIT AND WIRE AS DETAILED ON CONDUIT BLOCK DIAGRAMS FOR ALL POWER AND CONTROL FOR PUMPS #1 AND #2.
5. TE'S AND GE'S ARE INTERNAL TO SUBMERSIBLE PUMPS WITHIN WET WELL.
6. LE'S ARE INTERNAL TO THE WET WELL.
7. ENVELOPE WITHIN 3 FT OF FA PIPING, BLOWER, AND ABOVE BIOFILTER IS C1D2 PER NFPA 820.
8. EXTENT OF CLASSIFIED AREA PER NFPA 820 IS AN ENVELOPE WITHIN 3 FT AROUND THE HATCH OPENING AND 18" ABOVE THE SLAB. AN ENVELOPE WITHIN 3 FT OF THE VENT IS CLASS I DIV 2 AND ANOTHER 2 FT OUTSIDE OF THAT ENVELOPE IS CLASS I DIV 2.
9. PROVIDE A QUANTITY OF 2 HAND HOLES TO SEPARATE BETWEEN AC AND DC WIRING.
10. BOND EXPOSED METAL PIPES AND WET WELL HATCH FRAME TO EXISTING GROUND GRID. EXPAND EXISTING GROUND GRID TO ENCAPSULATE AROUND NEW WET WELL.
11. SEE DETAIL ON SHEET E9 FOR MOUNTING OF PANEL/ELECTRIC DEVICES.

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City of Phoenix

CITY OF PHOENIX
WATER SERVICES DEPARTMENT
COLLECTION SYSTEMS
REMOTE FACILITIES

ELECTRICAL

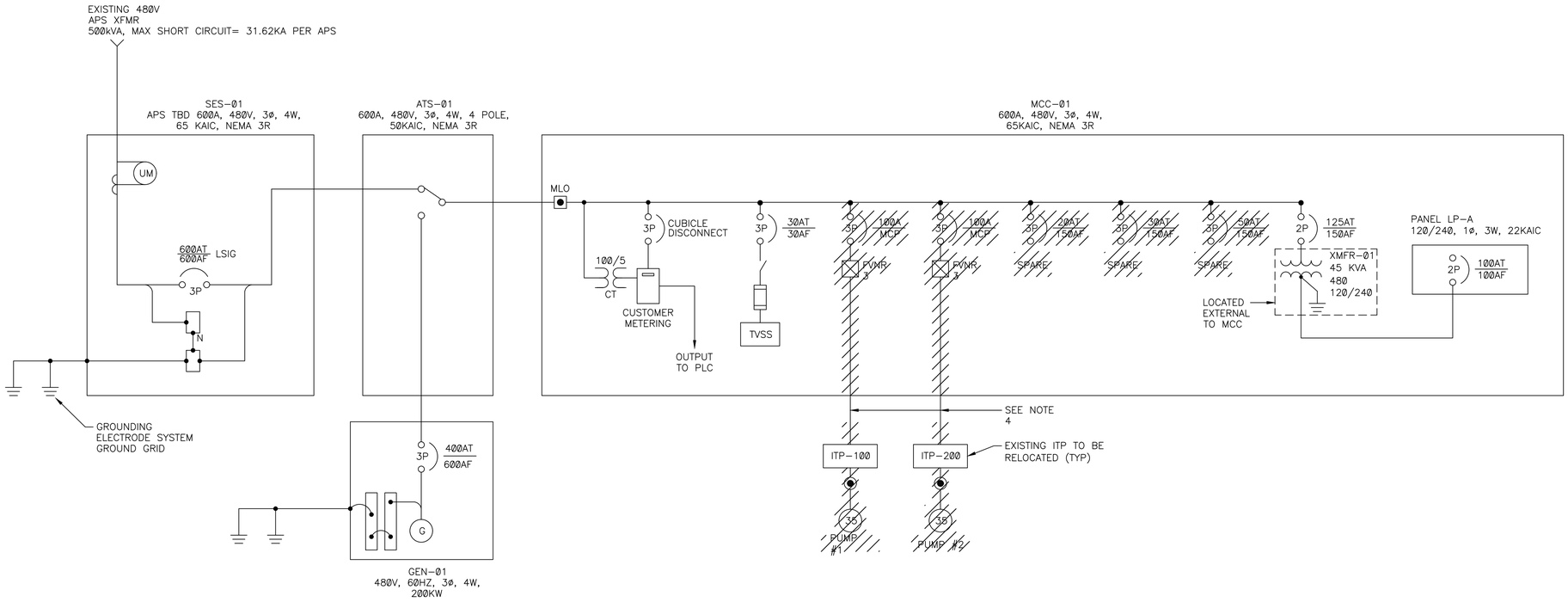
LIFT STATION 76 PHASE II EXPANSION
ELECTRICAL SITE PLAN

CITY PROJECT NO. WS90400067

DATE: MAY 2023

E05 SHEET 28 OF 41

CAD FILE: 04276.05_E05



MCC-01 SINGLE LINE DIAGRAM – DEMOLITION

NOTES

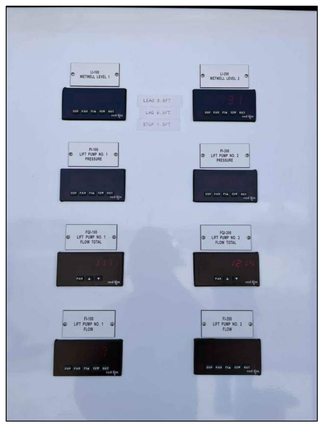
1. REMOVE EXISTING STARTERS AND BREAKERS, AND TURN OVER TO OWNER.
2. REMOVE ALL ASSOCIATED WIRE FOR POWER AND CONTROLS FOR PUMPS #1 AND #2. REMOVE ALL ASSOCIATED POWER AND CONTROL WIRING FROM EXISTING CONDUITS FROM WET WELL BACK TO MCC-01, AND LCP-PCP-LS76.
3. RETURN SALVAGED ITEMS TO THE CITY OF PHOENIX.
4. EXISTING CONDUITS FOR NEW PUMPS 1 & 2 TO BE UTILIZED FROM MCC TO NEW INTERCEPT POINT FOR FUTURE FEEDS AS SHOWN ON E-05. BEYOND INTERCEPT, DEMOLISH EXISTING PUMP FEEDS.

MOTOR CONTROL
CENTER
MCC-01

1	2	3
PDM	SPARE	LP-A
MLO	SPARE	
	SPARE	
	ITP-100	
SPD BREAKER		
SURGE PROTECTION DEVICE	ITP-200	
		XFMR-01 BREAKER
	SPACE	SPACE

MCC-01 ELEVATION

SCALE = NOT TO SCALE



PUMP CONTROL NOTES

1. REUSE EXISTING MINI CAS II MOTOR PROTECTION RELAYS FOR NEW PUMPS #1 AND #2,
2. RESET LIFT PUMP RUN TIME (HOURS), REMOVE AND TURN OVER TO OWNER IF RESET IS NOT POSSIBLE. REPLACE WITH NEW LIFT PUMP RUN TIME (HOURS) FOR PUMPS #1 AND #2 IF RESET IS NOT POSSIBLE.
3. VERIFY IF DIGITAL DISPLAYS CAN BE REUSED, IF NOT REMOVE AND REPLACE AND INSTALL PER SPECIFICATION 17052. NEW DISPLAYS. IF NEW DIGITAL DISPLAY IS INSTALLED, RECONNECT POWER AND SIGNALS AS REQUIRED.

EXISTING LCP-PCP-LS76 LIFT STATION NO.76 PUMP CONTROL

SCALE = NOT TO SCALE

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City of Phoenix

CITY OF PHOENIX
WATER SERVICES DEPARTMENT
COLLECTION SYSTEMS
REMOTE FACILITIES

ELECTRICAL

LIFT STATION 76 PHASE II EXPANSION
ELECTRICAL SINGLE LINE DEMOLITION

CITY PROJECT NO. WS90400067

DATE: MAY 2023

E06 SHEET 29 OF 41

CAD FILE: 04276.05_E06

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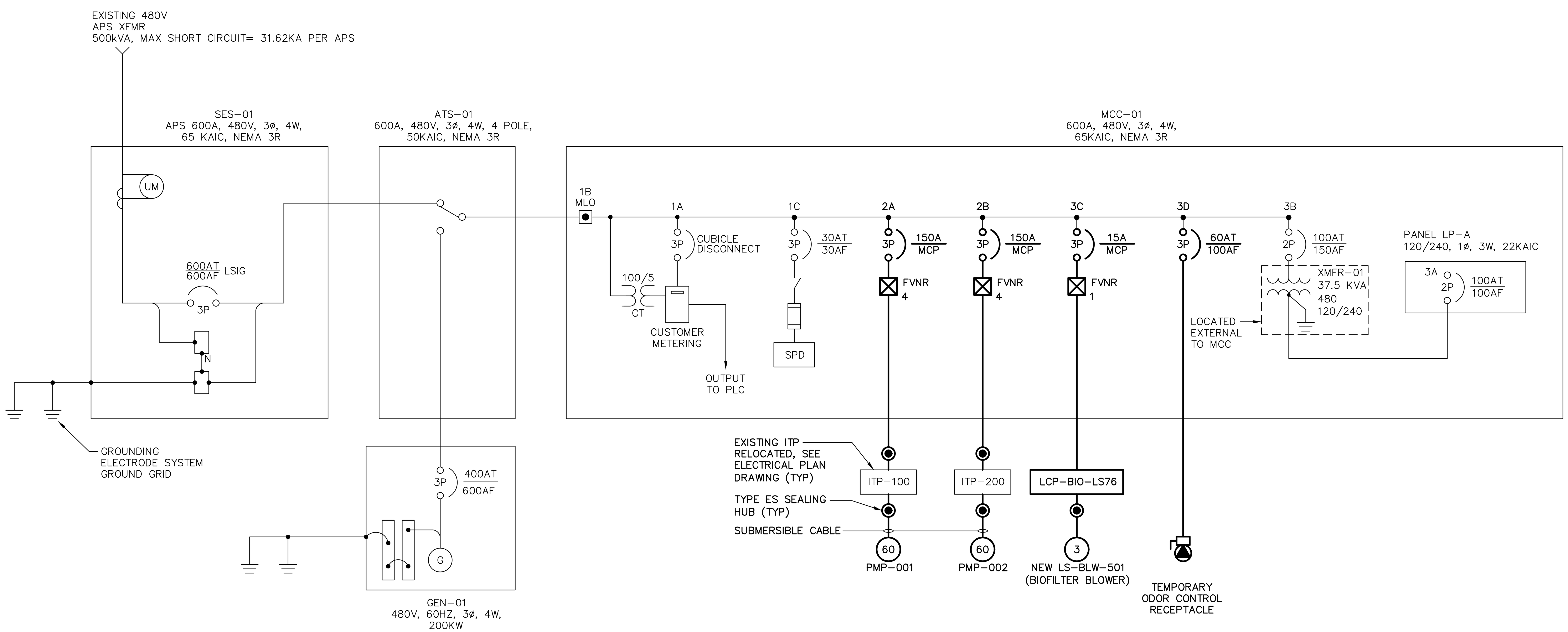
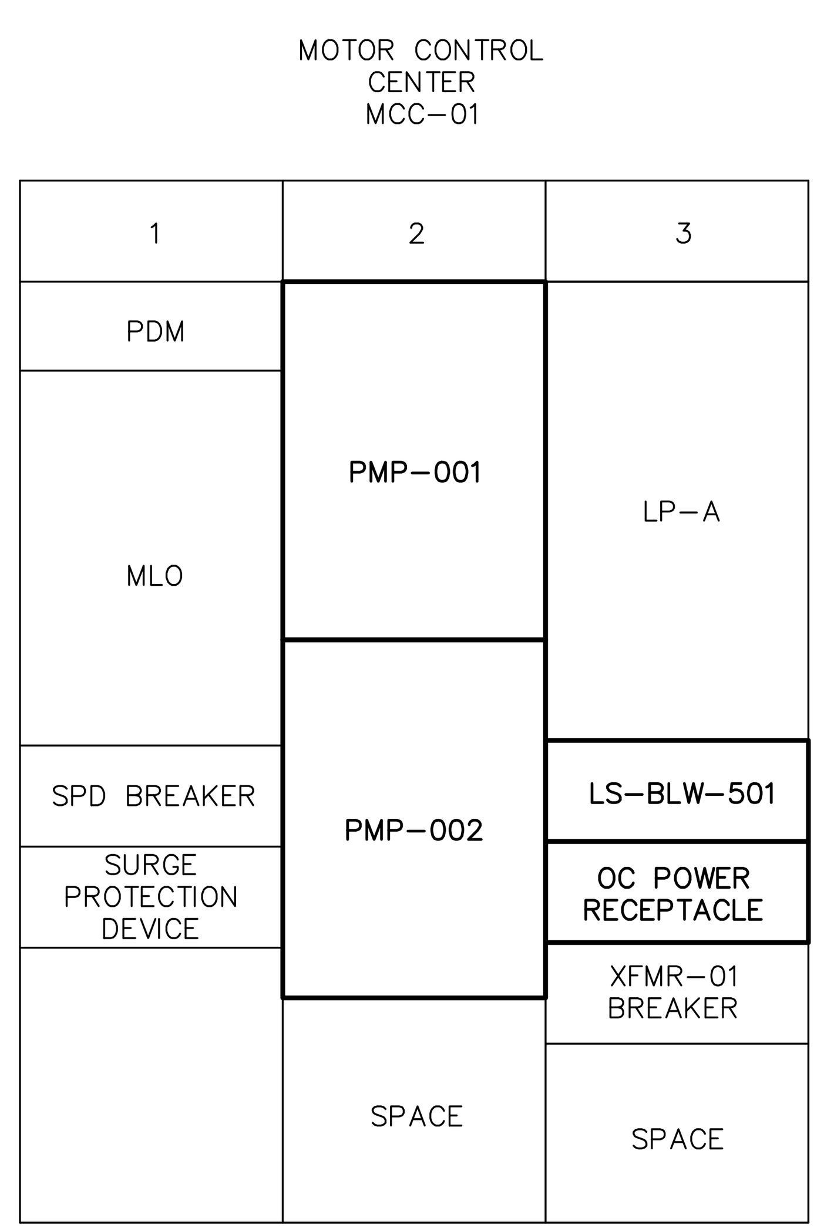


MCC-01 SINGLE LINE DIAGRAM



MCC-01 ELEVATION

SCALE = NOT TO SCALE

LOAD SUMMARY

FAC/AREA (ZONE/SITE): LS-76
EQUIPMENT LOCATION:
TAG NAME: MCC-01
FED FROM: SES-01

MANUFACTURER: SQUARE D
VOLTS/PHASE/WIRE: 480 VAC, 3P, 4W
MAIN BUS RATING: 600A
MAIN BREAKER (AMPS): 600A
AIC RATING (AMPS): 65kA
MAIN LUG ONLY: YES

CUBICLE NO.	TAG/CMMS NUMBER	BREAKER SIZE	STARTER SIZE	FEEDER CABLE SIZE	EQUIPMENT NAME	KVA	HP	FLA	BREAKER TRIP RATING
2A		MCP	4	#1	PUMP#1 (PMP-001)		60	77.0	150
2B		MCP	4	#1	PUMP#2 (PMP-002)		60	77.0	150
3D		100A	N/A	#1	XFMR-01 (37.5KVA)	37.5	N/A	78.1	100A
1C		30A	N/A		TVSS		N/A		30A
1A		N/A	N/A		PQM		N/A		N/A
3B		MCP	1	#12	BIOFILTER BLOWER (LS-BLW-501)		3	4.8	15A
3D		100A	N/A	#4	TEMP ODOR CONTROL RECEPTACLE		N/A	60.0	60A
FLA FOR NON-MOTOR LOAD (KVA):						37.5			
SUBTOTAL:								296.9	
PLUS 25% OF LARGEST MOTOR:								19.3	
TOTAL AMPS								316.2	
% LOADED (NO LARGER THAN 80% OF SELECTED LOAD SERVICE SIZE):								52.7%	

LOAD SUMMARY

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JOSEPH E DINKEL
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ARIZONA, U.S.A.

GREELEY AND HANSEN
2800 N. 44TH STREET, SUITE 650
PHOENIX, AZ 85008

REVISIONS

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City of Phoenix

CITY OF PHOENIX
WATER SERVICES DEPARTMENT
COLLECTION SYSTEMS
REMOTE FACILITIES

ELECTRICAL
LIFT STATION 76 PHASE II EXPANSION
ELECTRICAL SINGLE LINE AND EQUIPMENT ELEVATION

CITY PROJECT NO. WS90400067
DATE: MAY 2023

CAD FILE: 04276.05_E07

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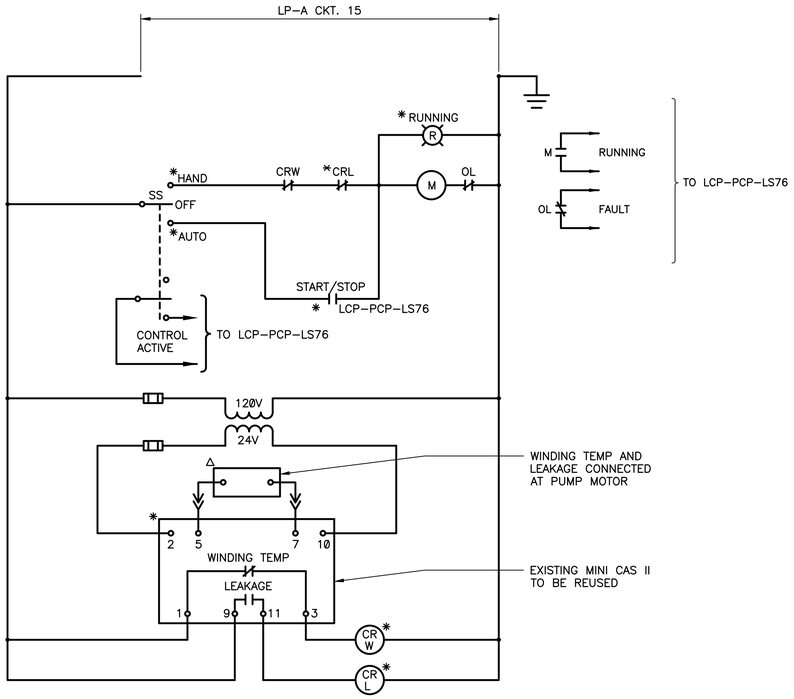
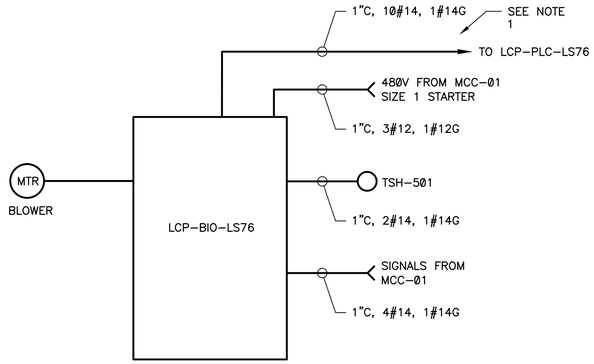


PMP-001 SCHEMATIC DIAGRAM

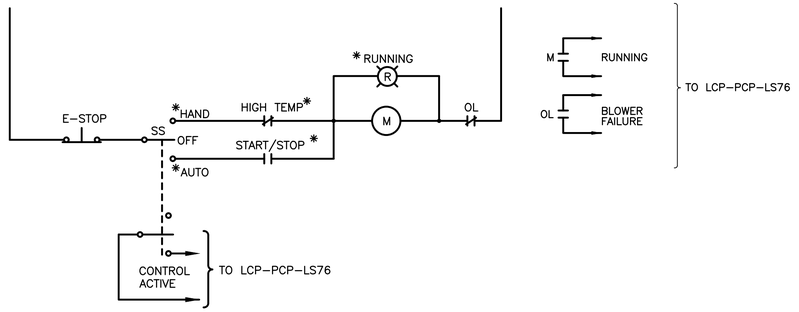
NOT TO SCALE

SIMILAR FOR PMP-002



BLOWER LOCAL CONTROL PANEL
LCP-BIO-LS76 BLOCK WIRING DIAGRAM

NOT TO SCALE



BLOWER SCHEMATIC DIAGRAM

NOT TO SCALE

LEGEND:

* LOCATED IN PUMP CONTROL PANEL LCP-PCP-LS76

△ LOCATED AT PUMP MOTOR

NOTES

1. PENDING VERIFICATION FROM I&C.

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City of Phoenix

CITY OF PHOENIX
WATER SERVICES DEPARTMENT
COLLECTION SYSTEMS
REMOTE FACILITIES

ELECTRICAL

LIFT STATION 76 PHASE II EXPANSION
SCHEMATIC DIAGRAM

CITY PROJECT NO. WS90400067

DATE: MAY 2023

E08 SHEET 31 OF 41

CAD FILE: 04276.05_E08

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PANEL LP-A

VOLTAGE, PHASE AND WIRE:	120, 240	VAC:	1Ø, 3W
BUS SIZE:	225	AMPS:	
MAIN SIZE:	150	AMPS:	
MAIN TYPE:	MCB		
MAIN TYPE:	BOLT-ON		

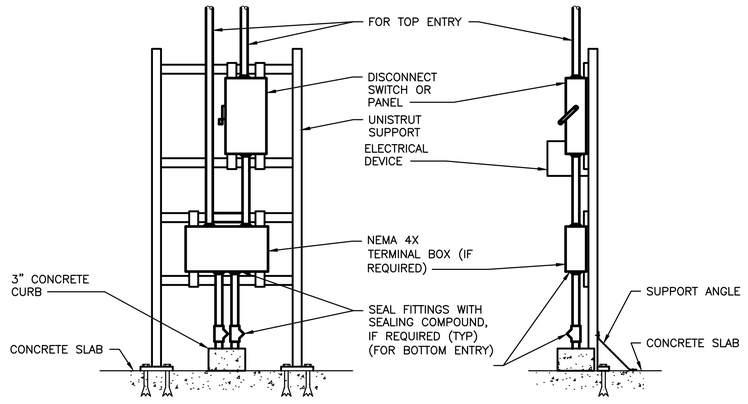
MANUFACTURER: SQUARE D
LOCATION: LS-76 MCC
ENCLOSURE: NEMA 3R
MOUNTING: MCC SECTION
BUS BRACING: 22kAIC
FED FROM: XFMR-Ø1 37.5KVA

CKT NO.	LOAD DESCRIPTION	CKT BREAKER AMP	AMPS A	AMPS B	AMPS A	AMPS B	CKT BREAKER AMP	LOAD DESCRIPTION	CKT NO.
1	EXTERIOR 120VAC OUTLETS	20	6.0		6.0		20	ALCP-100	2
3	GENERATOR BATTERY CHARGER	20		4.5		14.0	20	LCP-PCP-LS76 AIR CONDITIONER	4
5	GENERATOR BLOCK HEATER	20	12.5		5.0		20	LCP-PCP-LS76 UPS	6
7	EXTERIOR 240VAC OUTLETS	20		3.0		1.0	20	LCP-SEC-LS76	8
9			3.0		5.0		20	LCP-PLC-LS76 UPS POWER	10
11	LCP-PLC-LS76 LIGHT AND RCPT	20		2.0		14.0	20	LCP-SEC-LS76 AIR CONDITIONER	12
13	LCP-PCP-LS76 LIGHT AND RCPT	20	2.0		10.0		20	LCP-COM-LS76	14
15	LCP-PCP-LS76 PMP-001 CONTROL PWR	20		2.0		5.0	20	LCP-COM-LS76 AIR CONDITIONER	16
17	LCP-PCP-LS76 PMP-002 CONTROL PWR	20	2.0		6.0		20	SITE LIGHTING	18
19	SHADE CANOPY LIGHTING AND RECEPT	20		3.0		13.0	20	NORTH GATE CONTROLLER	20
21	SOUTH GATE CONTROLLER	20	13.0		13.0		20		22
23		20		13.0		12.0	15	LCP-OXD-LS76	24
25	BIOFILTER IRRIGATION CONTROLLER	20	16.0		16.0		20	LIT 501	26
27	SPACE	100					20	LIT-100	28
29							20	LIT-200	30

NOTES:

KVA A PHASE: 14.0 AMPS A PHASE: 131.5
KVA B PHASE: **10.0** AMPS B PHASE: **86.5**

TOTAL KVA: **24.0** (LOAD TOTALS ARE CALCULATED AS CONTINUOUS DUTY AT 125%)



PANEL/ELECTRIC
DEVICE MOUNTING DETAIL
SCALE: NTS

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City of Phoenix

CITY OF PHOENIX
WATER SERVICES DEPARTMENT
COLLECTION SYSTEMS
REMOTE FACILITIES

ELECTRICAL

LIFT STATION 76 PHASE II EXPANSION
PANEL LOAD SCHEDULE AND DETAIL

CITY PROJECT NO. WS90400067
DATE: MAY 2023
E9 SHEET 32 OF 41
CAD FILE: 04276.05_E09

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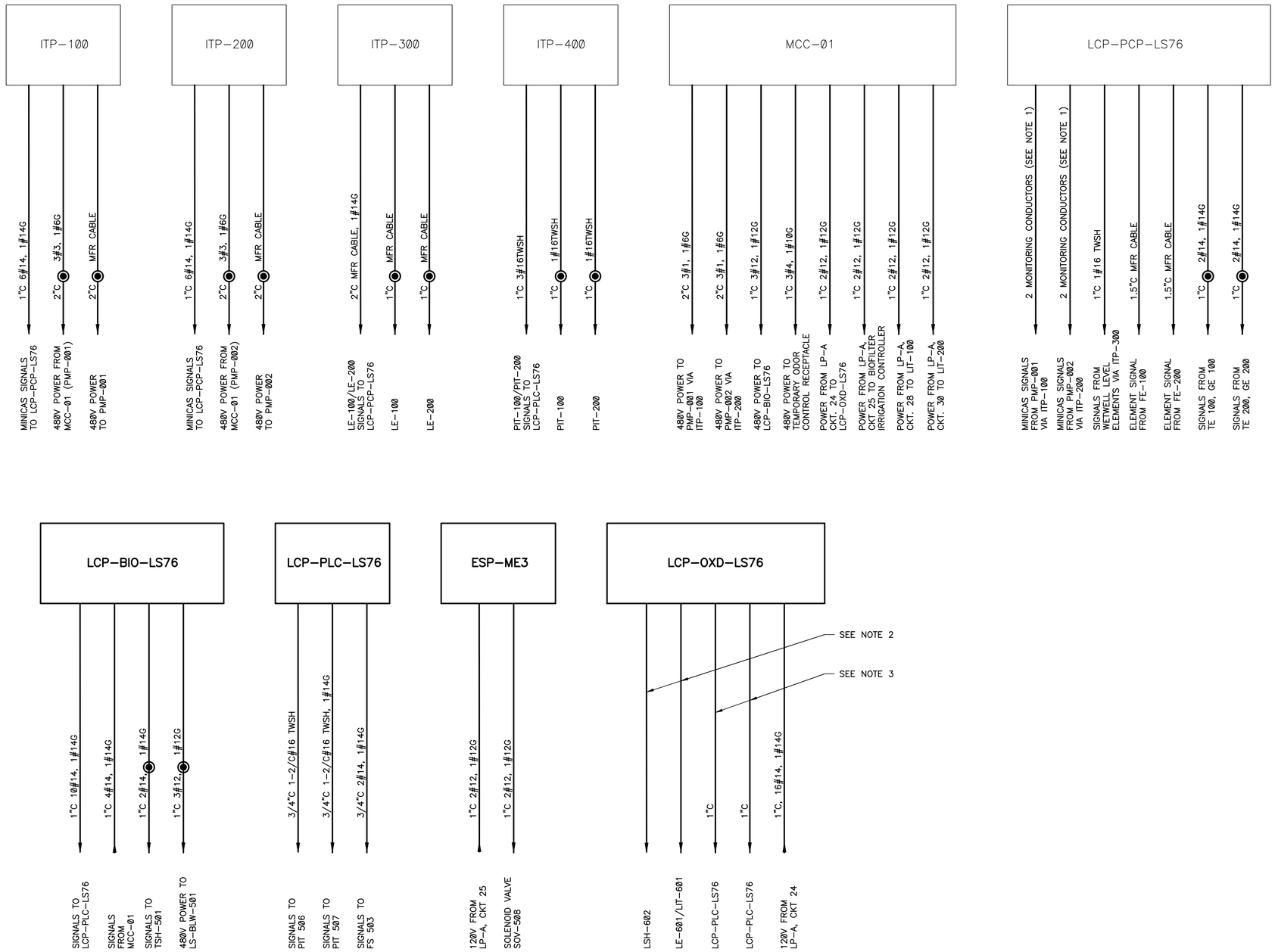

NOTES

1. COORDINATE WITH PUMP MANUFACTURER FOR WIRING REQUIREMENTS FOR MINICAS COMPATIBLE MONITORING CONDUCTORS.
2. CONDUITS AND CABLES REQUIRED TO BE PROVIDED BY OTHERS.
3. UTILIZED CONDUITS PROVIDED, CABLES REQUIRED TO BE PROVIDED BY OTHERS.

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REVISION	ENGINEERING COMPANY	PROJECT NO.	PROJECT NAME	DATE	CAD FILE NAME	DWG NUMBER
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

Contact Arizona 811 at least two full working days before you begin excavation
ARIZONA811 BLUE STAKE, INC.
Call 811 or click Arizona811.com

Registered Professional Engineer
CERTIFICATE NO.
77484
JOSEPH E DINKEL
Date Signed
ARIZONA, U.S.A.

GREELEY AND HANSEN
2800 N. 44TH STREET, SUITE 650
PHOENIX, AZ 85008

REVISIONS				
NO.	BY	DATE	CKD	REMARKS

DES LC
DWN MV
CKD DA

City of Phoenix

CITY OF PHOENIX
WATER SERVICES DEPARTMENT
COLLECTION SYSTEMS
REMOTE FACILITIES

ELECTRICAL

LIFT STATION 76 PHASE II EXPANSION
CONDUIT BLOCK DIAGRAM

CITY PROJECT NO. WS90400067
DATE: MAY 2023
E10 SHEET 33 OF 41
CAD FILE: 04276.05_E10

THIS DRAWING MUST BE FIELD VERIFIED BEFORE USE
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SUBMITTAL

100%

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INSTRUMENT IDENTIFICATION TABLE

LETTER	FIRST LETTER: MEASURED OR INITIATING VARIABLE	SUCCEEDING LETTERS: READOUT OUTPUT OR PASSIVE FUNCTION
A	ANALYSIS	ALARM
B	BURNER, COMBUSTION	CLOSE, STOP, DECREASE
C	CONDUCTIVITY, COMPUTER	CONTROL
D	DENSITY, DIFFERENTIAL	OPEN, START, INCREASE
E	VOLTAGE (EMP)	SENSOR (PRIMARY ELEMENT)
F	FLOW RATE, RATIO (FRACTION)	FORWARD
G	MOISTURE	GLASS, GAUGE, GATE
H	HAND	HIGH, OPENED
I	CURRENT (ELECTRICAL)	INDICATE
J	POWER, SCAN	–
K	TIME, TIME SCHEDULE, TIME RATE OF CHANGE	CONTROL STATION
L	LEVEL	LOW, CLOSED
M	MOTOR, MANUAL	MOMENTARY, MIDDLE, INTERMEDIATE
N	INTRUSION	ON OPERATE, RUNNING
O	–	ORIFICE, RESTRICTION, OVERLOAD
P	PRESSURE, VACUUM	POINT (TEST) CONNECTION
Q	QUANTITY, INTEGRATE, TOTALIZE	–
R	RADIATION	RECORD
S	SPEED, FREQUENCY, MOTION, SAFETY	SWITCH
T	TEMPERATURE	TRANSMIT
U	MULTIVARIABLE	MULTIFUNCTION
V	VIBRATION, VALVE	VALVE, DAMPER, LOUVER
W	WEIGHT, FORCE, TORQUE	WELL
X	UNCLASSIFIED, X-AXIS	UNCLASSIFIED
Y	EVENT, STATE, PRESENCE, Y-AXIS	RELAY, COMPUTE, CONVERT
Z	POSITION, DIMENSION, Z-AXIS	DRIVER, ACTUATOR, OR UNCLASSIFIED FINAL CONTROL ELEMENT

DEMOLITION

BASE INSTRUMENTATION SYMBOLS

XXXX / # — FIELD MOUNTED

XXXX / # — FACE OF MCC OR PANEL MOUNTED

XXXX / # — INTERIOR OF PANEL MOUNTED

XXXX / # — FIELD INDICATOR

XXXX / # — PANEL INDICATOR

X / # — OPERATOR INTERFACE FUNCTION

X / # — AUXILLARY INTERFACE FUNCTION

X / # — PLC FUNCTION

XXXX / # — IN-LINE

XXXX / # — TAPPED OR SAMPLED

XXXX / # — EXPOSED, SUBMERGED PROBE OR GAS DETECTOR

ANALYSIS INSTRUMENTS

ALKY = ALKALINITY
BOD = BIOCHEMICAL OXYGEN DEMAND
CH_4 = METHANE
CO_2 = CARBON DIOXIDE
COMB = COMBUSTIBLE GAS
CL_2 = CHLORINE
CLTR = CHLORINE TOTAL RESIDUAL
CLFR = CHLORINE FREE RESIDUAL
CO = CARBON MONOXIDE
DE = DENSITY
DO = DISSOLVED OXYGEN
F = FLUORIDE
$FeCL_3$ = FERRIC CHLORIDE
H_2S = HYDROGEN SULFIDE
H_2SO_4 = SULFURIC ACID
H_3PO_4 = PHOSPHORIC ACID
HC = HYDROCARBONS
HDNS = HARDNESS
HUM = HUMIDITY
MOH = METHANOL
NH = AMMONIA
NO_3^4 = NITRIC OXIDE
N_2 = NITROGEN
O_2 = OXYGEN
OP = ORTHO PHOSPHATE
ORP = OXIDATION REDUCTION POTENTIAL
OUR = OXYGEN UPTAKE RATE
OZ = OZONE
PH = pH
SD = SOLIDS DENSITY
SO2 = SULPHUR DIOXIDE
TOC = TOTAL ORGANIC CARBON
TOD = TOTAL OXYGEN DEMAND
TRB = TURBIDITY
TSS = TOTAL SUSPENDED SOLIDS
LEL = LOWER EXPLOSIVE LIMIT

HAND SWITCHES/PUSHBUTTONS

ACK = ACKNOWLEDGE
AM = AUTO/MANUAL
CAM = COMPUTER/AUTO/MANUAL
CLM = COMPUTER/LOCAL/MANUAL
CM = COMPUTER /MANUAL
COC = CLOSE/OPEN/COMPUTER
ESP = EMERGENCY STOP
ELOS = EMERGENCY LOCKOUT STOP
FJ = FORWARD JOG
FR = FORWARD/REVERSE
FS = FAST/SLOW
FOR = FORWARD/OFF/REVERSE
FOS = FAST/OFF/SLOW
FWD = FORWARD
HO = HAND/OFF
HOA = HAND/OFF/AUTO
HOC = HAND/OFF/COMPUTER
HOR = HAND/OFF/REMOTE
HOAR = HAND/OFF/AUTO/REMOTE
LC = LOCAL/COMPUTER
LT = LAMP TEST
LOC = LOCAL/OFF/COMPUTER
LOR = LOCAL/OFF/REMOTE
LOS = LOCKOUT STOP
LR = LOCAL/REMOTE
OAC = OPEN/AUTO/CLOSE
OC = OPEN/CLOSE
OCC = OPEN/CLOSE/COMPUTER
OO = ON/OFF
OSC = OPEN/STOP/CLOSE
POT = POTENTIOMETER
REV = REVERSE
RJ = REVERSE JOG
ROT = RUN/OFF/TEST
RS = RESET
SEL = SELECT
SIL = SILENCE
SLOS = START/LOCKOUT STOP
SM = SYSTEM/MANUAL
SP = STOP
SS = START/STOP
ST = START
TST = TEST
UD = UP/DOWN

SIGNAL CONDITIONERS

* = FUNCTION

AVG = AVERAGE
1:1 = REPEAT
1:X = BOOST (X=MULTIPLIER)
> = SELECT HIGHEST SIGNAL
< = SELECT LOWEST SIGNAL
X = BIAS
% = GAIN ATTENUATE
Δ = DIFFERENCE
Σ = SUM
× = MULTIPLY
÷ = DIVIDE
F(x) = CHARACTERIZED
√ = SQUARE ROOT
X^N = RAISED TO THE NTH POWER

SIGNAL CONVERTERS

* = INITIAL VARIABLE/CONVERTED VARIABLE

E = VOLTAGE
F = FREQUENCY
I = CURRENT
M = MOTOR
P = PNEUMATIC
PF = PULSE FREQUENCY
PD = PULSE DURATION
R = RESISTANCE

INDICATOR LIGHTS

XXXX

LAH = LEVEL ALARM HIGH
MA = MOTOR OVERLOAD ALARM
MN = MOTOR RUN STATUS
PAH = PRESSURE ALARM HIGH
SA = STROBE ALARM
YA = VFD FAULT

SIGNAL LINE LEGEND

ELECTRIC SIGNAL
HYDRAULIC SIGNAL
PNEUMATIC SIGNAL
FIBER OPTIC MEDIUM
SOFTWARE LINK (E.G. RS232, 485)
CAPILLARY TUBE

CONTROL SYSTEM INPUTS & OUTPUTS

PULSE INPUT
PULSE OUTPUT
ANALOG INPUT
ANALOG OUTPUT
DIGITAL INPUT
DIGITAL OUTPUT

ELECTRICAL INTERLOCKS

##

= A UNIQUE NUMBER (1 OR 2 DIGITS) ASSIGNED AS REFERENCE TO THE PARTICULAR INTERLOCK

NOTE: IN THE INTERLOCK LEGEND, LOCATED AT THE BOTTOM OF A P&ID, A BRIEF DESCRIPTION OF THE INTERLOCK'S FUNCTION IS PROVIDED AS WELL AS A REFERENCE TO THE CONTROL SCHEMATIC DRAWING NUMBER WHICH REFERENCES THE INTERLOCK.

R — NOHC

NC = NORMALLY CLOSED
NO = NORMALLY OPEN
NOHC = NORMALLY OPEN HELD CLOSED
R = RELAY WITH EACH SIGNAL LINE LEAVING DENOTING A POLE
R = RELAY WITH EACH SIGNAL LINE LEAVING DENOTING A POLE

7-DIGIT SERIALIZED KEY

XXXXXXX

NOTE: ALL VALVES, INSTRUMENTS, MOTORS, EQUIPMENT, ETC. ARE TO HAVE A FIXED 7-DIGIT SERIAL NUMBER. THIS NUMBER IS TO BE ASSIGNED TO THE PROJECT BY THE CITY'S PROJECT MANAGER.

EQUIPMENT PROVIDED BY OTHERS

V* — DENOTES VENDOR PACKAGE BOUNDARY

V* = VENDOR PROVIDED INDIVISUAL PIECE OF EQUIPMENT
O* = OWNER PROVIDED INDIVISUAL PIECE OF EQUIPMENT

FLOW STREAM LINE LEGEND

XXXX-YY" — PRIMARY FLOW STREAM
XXXX-YY" — SECONDARY FLOW STREAM
XXXX-YY" — TERTIARY FLOW STREAM

NOTE: XX IDENTIFIES THE FLOWSTREAM. SEE ABBREVIATIONS BELOW. ARROWS AND FLOW STREAM IDENTIFICATION TO BE LOCATED BEFORE AND AFTER EACH PIECE OF EQUIPMENT ON P&ID AS SPACE PERMITS.
YY DENOTES LINE SIZE IN INCHES

DRAWING CONTINUATION LEGEND

NN/XX — TO PROC/EQP — FLOW STREAM NO. NN TO DWG. NO. XX

FROM PROC/EQP — NN/XX — SIGNAL NO. NN FROM DWG. NO. XX

FROM PROC/EQP — TO PROC/EQP — FLOW STREAM TO OR FROM EQUIPMENT NOT SHOWN ON OTHER DRAWINGS.

(#) (#) — FLOW STREAM OR SIGNAL LINE CONTINUATION ON SAME DRAWING.

LARGE BREAK

SIGNAL LINE BREAK

CONNECTION POINT

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Registered Professional Engineer
CERTIFICATE NO.
77484
JOSEPH E
DINKEL
Date Signed 6/30/23
ARIZONA, U.S.A.

GREELEY AND HANSEN
2800 N. 44TH STREET, SUITE 650
PHOENIX, AZ 85008

REVISIONS				
NO.	BY	DATE	CKD	REMARKS

DES AG
DWN MV
CKD DR

City of Phoenix

CITY OF PHOENIX
WATER SERVICES DEPARTMENT
COLLECTION SYSTEMS
REMOTE FACILITIES

INSTRUMENTATION AND CONTROL

LIFT STATION 76 PHASE II EXPANSION
LEGEND 1

CITY PROJECT NO. WS90400067
DATE: MAY 2023
I01 SHEET 34 OF 41
CAD FILE: 04276.05_I01

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ACTUATOR SYMBOLS

- CYLINDER ACTUATOR (XX)
- DIAPHRAGM ACTUATOR (PRESSURE BALANCED) (XX)
- DIAPHRAGM ACTUATOR (SPRING OPPOSED) (XX)
- ELECTROHYDRAULIC ACTUATOR (E/H, XX)
- ELECTROPNEUMATIC ACTUATOR (E/P, XX)
- ELECTRIC ACTUATOR (E, XX)
- MANUAL ACTUATOR
- POSITIONER (Z, XX)
- PRESSURE RELIEF
- SOLENOID ACTUATOR (S, XX)

MOTOR OPPERATED VALVE (O, C, ZIL XXXX, ZIH XXXX, ZSL XXXX, ZSH XXXX, OSC, LOC, HMS XXXX, HS XXXX, MOV-XXXX, XXXXXXX, M)

ACTUATOR LEGEND: XX INDICATES STATUS OF ACTUATOR ON LOSS OF POWER WITH THE FOLLOWING OPTIONS:

- FO = FAIL OPEN,
- FC = FAIL CLOSED,
- FP = FAIL TO PRE-SET POSITION, AND
- BLANK = FAIL TO LAST POSITION.

COMMUNICATION SYMBOLS

- RADIO TOWER
- RADIO WAVE PROPAGATION
- YAGI ANTENNA
- OMNIDIRECTIONAL ANTENNA

EQUIPMENT SYMBOLS

- BLOWER
- BURNER
- CALIBRATION COLUMN
- CHLORINATOR
- COMPRESSOR (CENTRIFUGAL)
- COMPRESSOR (RECIPROCATING, POSITIVE DISPLACEMENT)
- COMPRESSOR (ROTARY, POSITIVE DISPLACEMENT)
- COMPRESSOR
- COUPLING CONNECTION
- DAMPER
- DIFFUSER
- DISCONNECT SWITCH (YS XXXX, XXXV): YS = AUXILLARY CONTACT; XXXX = LOOP NO.; XXXV = VOLTAGE
- DRAIN
- EJECTOR
- EMERGENCY EYEWASH & SHOWER
- EVAPORATOR
- FILTER (F)
- FLEXIBLE HOSE
- GRINDER
- HEAT EXCHANGER
- LOAD CELL
- MIXER (STATIC)
- MIXER
- LARGE MOTOR
- SMALL MOTOR (M)
- OIL EXPANSION CHAMBER
- PULSATION DAMPENER
- REDUCER
- ROTARY CHEMICAL FEEDER
- SEPARATOR
- SILENCER
- STRAINER
- TURBINE
- VENT TO ATMOSPHERE (V)
- CONDENSATION DRAIN (D)
- OPERATOR INTERFACE TERMINAL (OIT)
- ALARN SIREN (Y): Y = H-PROCESS ALARM HORN, S-PERSONNEL SAFTEY SIREN
- STROBE (AHH XXXX): AAH = ALARM STROBE; XXXX = LOOP NO.

FLOW ELEMENTS

- ACOUSTIC DOPPLER FLOW METER (ADFM)
- BATCHMETER (PROPELLER/VALVE)
- DENSITY (MICROWAVE)
- FLUME FLOW ELEMENT
- MAGNETIC FLOW ELEMENT (IN LINE) (M)
- MAGNETIC FLOW ELEMENT (INSERTION) (M)
- MASS FLOW CORIOLIS TYPE
- MASS FLOW THERMAL METER (T)
- ORIFICE PLATE FLOW ELEMENT
- PRIMARY FLOW ELEMENT: PILOT TUBE
- ROTAMETER FLOW ELEMENT
- SONIC (CLAMP ON)
- SONIC FLOW ELEMENT (IN LINE)
- TARGET TYPE FLOW ELEMENT
- TOTALIZING ELEMENT: POSITIVE DISPLACEMENT FLOW
- TURBINE OR PROPELLER FLOW ELEMENT
- V-NOTCH WEIR
- VENTURI TUBE FLOW ELEMENT
- VORTEX FLOW ELEMENT

GATE SYMBOLS

- SLIDE GATE
- SLUICE GATE

LEVEL ELEMENTS

- BUBBLER LEVEL ELEMENT
- CAPACITANCE LEVEL ELEMENT
- CONDUCTIVITY LEVEL ELEMENT
- FLOAT LEVEL ELEMENT
- RADAR LEVEL ELEMENT
- RESISTIVE TAPE LEVEL ELEMENT
- SUBMERSIBLE LEVEL
- ULTRASONIC LEVEL ELEMENT
- SIGHT GLASS (SG)

PUMP SYMBOLS

- * INDICATES SPEED
- CS = COSTANT SPEED
- 2S = TWO SPEED
- VS = VARIABLE SPEED
- VT = VARIABLE STROKE (PER METERING PUMPS ONLY)
- BLANK = UNKNOWN

- CENTRIFUGAL PUMP
- DIAPHRAGM PUMP
- METERING, PERISTALTIC, OR PROPORTIONING PUMP
- PISTON PUMP
- PROGRESSIVE CAVITY PUMP
- ROTARY PUMP
- SCREW (LIFT) PUMP POSITIVE DISPLACEMENT
- SUBMERSIBLE SUMP PUMP
- VERTICAL TURBINE PUMP

VALVE SYMBOLS

- 3-WAY VALVE
- 4-WAY VALVES
- BACKFLOW PREVENTER
- BACKPRESSURE REGULATOR SELF CONTAINED
- BALL CHECK VALVE
- BALL VALVE
- BUTTERFLY VALVE
- DIAPHRAGM SEAL
- DIAPHRAGM VALVE
- FLAPPER CHECK VALVE
- FLOW STRAIGHTENER
- GATE VALVE
- GLOBE VALVE
- KNIFE VALVE
- NEEDLE VALVE
- PETCOCK
- PINCH VALVE
- PLUG VALVE
- PRESSURE REGULATING VALVE SELF CONTAINED
- PRESSURE RELIEF VALVE
- RUPTURE DISK (PRESSURE RELIEF)
- RUPTURE DISK (VACUUM RELIEF)
- SWING CHECK VALVE
- TELESCOPING VALVE
- VACUUM RELIEF VALVE
- VEE BALL VALVE

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REVISION	ENGINEERING COMPANY	PROJECT NO.	PROJECT NAME	DATE	CAD FILE NAME	DWG NUMBER	REMARKS

Registered Professional Engineer, CERTIFICATE NO. 77484, JOSEPH E DINKEL, ARIZONA, U.S.A., Date Signed

GREELEY AND HANSEN
2800 N. 44TH STREET, SUITE 650
PHOENIX, AZ 85008

REVISIONS

NO.	BY	DATE	CKD	REMARKS

DES AG
DWN MV
CKD DR

City of Phoenix

CITY OF PHOENIX
WATER SERVICES DEPARTMENT
COLLECTION SYSTEMS
REMOTE FACILITIES

INSTRUMENTATION AND CONTROL
LIFT STATION 76 PHASE II EXPANSION
LEGEND 2

CITY PROJECT NO. WS90400067
DATE: MAY 2023
I02 SHEET 35 OF 41
CAD FILE: 04276.05_I02

CSI COMPUTER CONTROL SYSTEM TAG EXTENSIONS

DIGITAL INPUT (STATUS)	DESCRIPTION
ATS Switch Activated	ATSActive
ATS Switch Disabled	ATSDisabled
ATS Switch in Normal Status	ATSNormal
Breaker Closed Status	BrkrClsed
Breaker Open Status	BrkrOpned
Disconnect Closed	DiscClsed
Emergency Lockout Stop Switch Status	ELOS
Emergency Mushroom Switch	EmergStop
Equipment Closed (Generic)	EqupClsed
Equipment Hand–Off–Auto Switch Status	EqupInAuto
Equipment at Maximum Capacity	MaxCap
Equipment at Minimum Capacity	MinCap
Equipment Opened (Generic)	EqupOpned
Equipment Ready	EqupReady
Equipment Running Status (Generic)	EqupRunStat
Equipment 1/2 Select Switch Status	SelectEqupOne
Equipment Start Active	EqupStart
Equipment Stop Active	EqupStop
Equipment in Test Mode	EqupTestMd
Flow Switch Status	FlowPresent
Forward Motion Status	FwdMotion
Gate Open Status	GateOpned
Gate Close Status	GateClsed
Local/Computer Switch Status	CompMode
Local/Remote Switch Status	RemMode
Panel Ready (circuit breaker common signal)	PwrFail
Pump Lead/Lag Switch Status	PumpInLead
Pump Running Status	PumpRunStat
Reverse Motion Status	RevMotion
Valve Open Status	VlvOpned
Valve Close Status	VlvClsed
VFD Bypass Mode Selected	VFDBypass
VFD Running Status	VFDRunStat

NOTE: THESE TAG EXTENSIONS ARE THE CURRENT STANDARD. THEY ARE IN USE AT THE CAVE CREEK, UNION HILLS, AND NORTH GATEWAY FACILITIES.

DIGITAL INPUT (ALARM)	DESCRIPTION
ATS Low Voltage (Voltage Loss)	ATSLoVolt
Blower in Surge Condition	BlwrSurge
Blower Shutdown due to Surge Condition	BlwrHiSurge
Building Smoke Detector Alarm	SmokeDet
Chemical Eyewash Activated	EyewashAct
Door Intrusion Switch Alarm	Intrusion
Electrical Breaker Tripped	BrkrTrip
Equipment Alarm (Common or Generic)	EqupAlm
Equipment Low Battery	LoBatt
Feed Pump Diaphragm Leak	DiaphLeak
Generator Battery Low Voltage	GenLoVolt
Generator Battery High Voltage	GenHiVolt
Generator Overcrank Detected	GenOvrcrank
Generator Overspeed Detected	GenOvrspeed
Generic System Fail	SysFail
High High Density	HiHiDensity
High High Torque Alarm	HiHiTorq
High High Vibration	HiHiVib
High High Vibration in X Direction	HiHiXVib
High High Vibration in Y Direction	HiHiYVib
High High Vibration in Z Direction	HiHiZVib
High Density	HiDensity
High Speed	HiSpd
High Torque Alarm	HiTorq
High Vibration	HiVib
High Vibration in X Direction	HiXVib
High Vibration in Y Direction	HiYVib
High Vibration in Z Direction	HiZVib
Low Speed Switch Activated	LowSpd
Main Power Failure	PwrFail
Maintenance Mode	MaintMde
Motor Amperage Low	LoMtrAmps
Motor Amperage High	HiMtrAmps
Motor Bearing High Temperature	MtrBearHiTemp
Motor Failure	MtrFail
Motor Overload Alarm	MtrOL
Motor Stator Moisture Detect	MtrLeak
Motor Winding High Temperature	MtrWindHiTemp
No Seal Water Present	NoSealWtr
Pipe Leak Detect	PipeLeak
Process Chem Concentration Low Low Level	LoLoChemConc
Process Chem Concentration Low Level	LoChemConc
Process Chem Concentration High High Level	HiHiChemConc
Process Chem Concentration High Level	HiChemConc
Process Gas Concentration Low Level	LoGasConc
Process Gas Concentration Low Low Level	LoLoGasConc
Generator Low Oil Pressure	GenLoOilPress
Generator Low Low Oil Pressure	GenLoLoOilPress
Generator High High Coolant Temperature	GenHiHiCoolTemp
Generator High Coolant Temperature	GenHiCoolTemp
Generator Low Coolant Temperature	GenLoCoolTemp
Generator Low Fuel Pressure	GenLoFuelPress
Generator Battery Charger Fault	GenBattChargFault
Generator Emergency Stop	GenEmergStop
Generator High Temperature	GenHiTemp
Generator Ready	GenReady

DIGITAL INPUT (ALARM) (CONTINUED)	DESCRIPTION
Process Gas Concentration High High Level	HiHiGasConc
Process Gas Concentration High Level	HiGasConc
Process Low Low Level	LoLoLevel
Process Low Low Press	LoLoPress
Process Low Low Temp	LoLoTemp
Process Low Flow	LoFlow
Process Low Level	LoLevel
Process Low Press	LoPress
Process Low Temp	LoTemp
Process High High DPress	HiHiDPress
Process High High Level	HiHiLevel
Process High High Press	HiHiPress
Process High High Temp	HiHiTemp
Process High DPress	HiDPress
Process High Flow	HiFlow
Process High Level	HiLevel
Process High Press	HiPress
Process High Temp	HiTemp
SCR Drive Fail	SCRDFail
Tank Leak Detect	TankLeak
Ultrasonic Meter Loss of Echo	EchoLoss
Valve Failed Open	OpenFail
Valve Failed Close	CloseFail
Variable Frequency Drive Fail	VFDFail
Sprinkler Water Flow	Sprklrflow

DIGITAL OUTPUT	DESCRIPTION
Gate Close Command	GateCls
Gate Open Command	GateOpn
Motor Forward Command	MtrFwd
Motor Reverse Command	MtrRev
Motor Start Command	MtrStart
Motor Start/Stop Command	MtrSS
Motor Stop Command	MtrStop
PLC/Serial Watchdog Bit Active	WtchDogbit
Process Normal	ProcNorm
Remote Alarm Acknowledge	RemAlmAck
Remote Chlorine Alarm	RemClAlm
Remote Common Alarm	RemCmnAlm
Remote Over–ride	RemOvride
Remote Shutdown Reset	RemReset
Remote Timer Start	TimerStart
Remote Timer Stop	TimerStop
Valve Close Command	VlvCls
Valve Open Command	VlvOpn

ANALOG INPUT	DESCRIPTION
Counter in Time	Time
Engine RPM	RPM
Equipment Position (Generic)	EqupPos
Gate Position (0–100%)	GatePos
Generator Coolant Temperature	GenCoolTemp
Generator Oil Pressure	GenOilPress
Generator Speed	Genspeed
Lamp Intensity	Intensity
Lamp Transmittance	Transmittance
MCC or Switchgear AMPS AC	Amps
MCC or Switchgear KW hours	KWH
MCC or Switchgear Power Factor	PwrFactor
MCC or Switchgear VAR–hours	VARH
MCC or Switchgear Volts AC	Volts
MCC or Switchgear Volt–Amps	Volt–Amps
MCC or Switchgear Volt–Amps Reactive	KVARS
MCC or Switchgear Watts	KW
Motor Bearing Temperature	MtrBearTemp
Motor AC Amperage	MtrAmps
Peristaltic Pump Speed	PmpSpeed
Process Chemical Concentration Measurement	ChemConc
Process Density or TSS Measurement	Density
Process Differential Pressure	DPress
Process Dissolved Oxygen Measurement	DissOxy
Process Flow Rate	Flow
Process Gas Concentration Measurement	GasConc
Process Level Measurement	Level
Process Oxidation Reduction Potential	ORP
Process pH	PH
Process Pressure Measurement	Press
Process Temperature Measurement	Temp
Process Turbidity Measurement	Turbidity
SCR Drive Speed Feedback	SCRDSpeed
Valve Position (0–100%)	VlvPos
Variable Frequency Drive AMPS	VFDAmps
Variable Frequency Drive Frequency	VFDFreq
Variable Frequency Drive Speed Feedback	VFDSpeed
Variable Frequency Drive Volts	VFDVolts
Vibration (Generic)	Vib
Vibration in X Direction	XVib
Vibration in Y Direction	YVib
Vibration in Z Direction	ZVib
Water Hardness Measurement	Hardness

ANALOG OUTPUT	DESCRIPTION
Equipment Position Control	EqupPosCtrl
Flow Pacing Control	FlowPaceCtrl
Generic Process Setpoint Control	SetpCtrl
Peristaltic Pump Speed Control	PmpSpdCtrl
SCR Drive Speed Control	SCRDSpeedCtrl
SCR Drive Stroke Control	SCRDStrokeCtrl
Valve Positioning Control	VlvPosCtrl
Variable Frequency Drive Control	VFDSpeedCtrl

COMMON SOFTWARE GENERATED TAGS	DESCRIPTION
PLC/Serial Equipment Communication Failed	CommFail
Pump or Equipment Accumulated Running Hours	Runtime

PARSON'S COMPUTER CONTROL SYSTEM TAG EXTENSIONS

DIGITAL INPUTS	DESCRIPTION	MISC. USES
AH	ALARM HIGH	
AL	ALARM LOW	
EH	VOLTAGE HIGH	
EL	VOLTAGE LOW	
FA	FLOW ALARM	FLOW HIGH HIGH, FLOW LOW LOW
FH	FLOW HIGH	
FL	FLOW LOW	
HA	HORN ALARM	
IA	CURRENT ALARM	
IH	CURRENT HIGH	
IL	CURRENT LOW	SURGE ALARM
JN	POWER ON	
JB	POWER OFF	
LA	LEVEL ALARM	LEVEL HIGH HIGH, LEVEL LOW LOW, LEVEL DIFFERENTIAL, RAIN HAUHE INPUT
LH	LEVEL HIGH	
LL	LEVEL LOW	
MA	MOTOR ALARM	OVERLOADS, DIAPHRAGM FAILURE
MB	MOTOR OFF	
MF	MOTOR FORWARD	
MN	MOTOR ON	
MR	MOTOR REVERSE	
MX	MOTOR UNCLASSIFIED	MOTOR ON–LINE, MOTOR IN STARTUP SEQUENCE, MOTOR OVERCRANK, LOAD SHED ACTIVE

NOTE: THESE TAG EXTENSIONS ARE BEING PHASED OUT. HOWEVER, THEY ARE STILL IN USE AT THE 23RD AND 91ST AVENUE FACILITIES.

DIGITAL INPUTS	DESCRIPTION	MISC. USES
PA	PRESSURE ALARM	PRESS. HIGH HIGH, PRESS. LOW LOW, PRESS. DIFFERENTIAL
PH	PRESSURE HIGH	
PL	PRESSURE LOW	
SA	SPEED ALARM	SPEED HIGH HIGH, SPEED LOW LOW
SH	SPEED HIGH	
SL	SPEED LOW	MOTOR WINDINGS, TEMP, HIGH HIGH, TEMP, LOW LOW
TA	TEMPERATURE ALARM	
TH	TEMPERATURE HIGH	MOTOR BEARINGS
TL	TEMPERATURE LOW	
UA	MULTI–VARIABLE ALARM	EYEWASH, VFD DRIVE FAULT, SYSTEM FAIL ALARM, GRINDER JAMMED, HVAC ALARM HAZ/MAT ALARM, FAIL TO START, FIRE ALARM, MODULE FAILURE
VA	VIBRATION ALARM	VIBRATION HIGH HIGH, VIBRATION LOW LOW
VH	VIBRATION HIGH	
WA	TORQUE ALARM	TORQUE HIGH HIGH, TORQUE LOW LOW
WL	TORQUE LOW	
WH	TORQUE HIGH	
XA	UNCLASSIFIED ALARM	INTRUSION ALARM, SENSOR FAILURE, MEDIA FAILURE, PULL CORD, FIRE ALARM, LEAK ALARM
XH	UNCLASSIFIED PREALARM	
XR	UNCLASSIFIED RECORD	TRUCK DRIVER ID

DIGITAL INPUTS	DESCRIPTION	MISC. USES
YA	SWITCH POSITION AUTO	MOISTURE DETECTION, SWITCH POSITION 1, SWITCH TO EMERGENCY
YB	LOCK OUT STOP	SWITCH POSITION 2, SWITCH TO NORMAL
YC	SWITCH POSITION	SWITCH POSITION 3, SWITCH TO NORMAL
YD	SWITCH POSITION	SWITCH POSITION 4
YF	SWITCH POSITION FORWARD	
YM	SWITCH POSITION REMOTE	
YN	SWITCH POSITION	IN COMPUTER, EMERGENCY STOP, IN REMOTE, IN AUTO
YR	SWITCH POSITION REVERSE	
YX	SWITCH POSITION UNCLASSIFIED	IN MANUAL, NORMAL MODE, L.O. STOP READY
ZA	POSITION A	USED FOR 3 WAY VALVES, FAIL TO OPEN
ZB	POSITION B	USED FOR 3 WAY VALVES, FAIL TO CLOSED
ZC	POSITION C	FAIL TO MOVE TO THE OPEN POSITION
ZD	POSITION D	FAIL TO MOVE TO THE CLOSE POSITION
ZH	POSITION HIGH	ON, OPENED
ZL	POSITION LOW	OFF, CLOSED

DIGITAL OUTPUTS	DESCRIPTION	MISC. USES
DD	AUTODIALER ON	
LD	LIGHTS ON	
MB	MOTOR STOP	
MD	MOTOR START	
ME	MOTOR EMERGENCY STOP	
MF	MOTOR FORWARD	
MR	MOTOR REVERSE	
SD	SYSTEM START	
UT	RESET	ACKNOWLEDGE ANNUNCIATOR
VA	VALVE POSITION A	USED FOR 3 WAY VALVES
VB	VALVE CLOSE	POSITION B (USED FOR 3 WAY VALVES)
VC	VALVE CONTROL	DIGITAL CONTROL OF VALVES
VD	VALVE OPEN	
UD	MULTIVARIABLE ALARM	ACTIVATES LOCAL ANNUNCIATOR

ANALOG OUTPUTS	DESCRIPTION	MISC. USES
FA	FLOW CONTROL	FLOW RATE A–USED WHEN MAPPING A REGISTER IN PLC
FB	FLOW CONTROL	FLOW RATE B–USED WHEN MAPPING A REGISTER IN PLC
FC	FLOW CONTROL	
KC	TIME CONTROL	
LC	LEVEL CONTROL	
VA	VALVE CONTROL	POSITION A–USED WHEN MAPPING A REGISTER IN PLC
VB	VALVE CONTROL	POSITION B–USED WHEN MAPPING A REGISTER IN PLC
VC	VALVE CONTROL	
SC	SPEED CONTROL	

ANALOG INPUTS	DESCRIPTION	MISC. USES
AI	ANALYSIS INDICATION	WIND DIRECTION
EI	VOLTAGE INDICATION	
FI	FLOW INDICATION	
II	CURRENT INDICATION	
JI	POWER INDICATION	POWER FACTOR INDICATION, VARS. FREQUENCY, WATTS
LI	LEVEL INDICATION	
PI	PRESSURE INDICATION	
SI	SPEED INDICATION	
TI	TEMPERATURE INDICATION	
VI	VIBRATION INDICATION	
WI	WEIGHT INDICATION	TORQUE INDICATION
ZI	POSITION INDICATION	

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REVISION	ENGINEERING COMPANY	PROJECT NO.	PROJECT NAME	CAD FILE NAME	DATE	DWG NUMBER	REMARKS
–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–

Registered Professional Engineer
CERTIFICATE NO. 77484
JOSEPH E DINKEL
Date Signed
ARIZONA, U.S.A.

GREELEY AND HANSEN
2800 N. 44TH STREET, SUITE 650
PHOENIX, AZ 85008

REVISIONS

NO.	BY	DATE	CKD	REMARKS

DES	AG
DWN	MV
CKD	DR

City of Phoenix

CITY OF PHOENIX
WATER SERVICES DEPARTMENT
COLLECTION SYSTEMS
REMOTE FACILITIES

INSTRUMENTATION AND CONTROL
LIFT STATION 76 PHASE II EXPANSION
ABBREVIATIONS

CITY PROJECT NO. WS90400067
DATE: MAY 2023
I03 SHEET 36 OF 41
CAD FILE: 04276.05_I03

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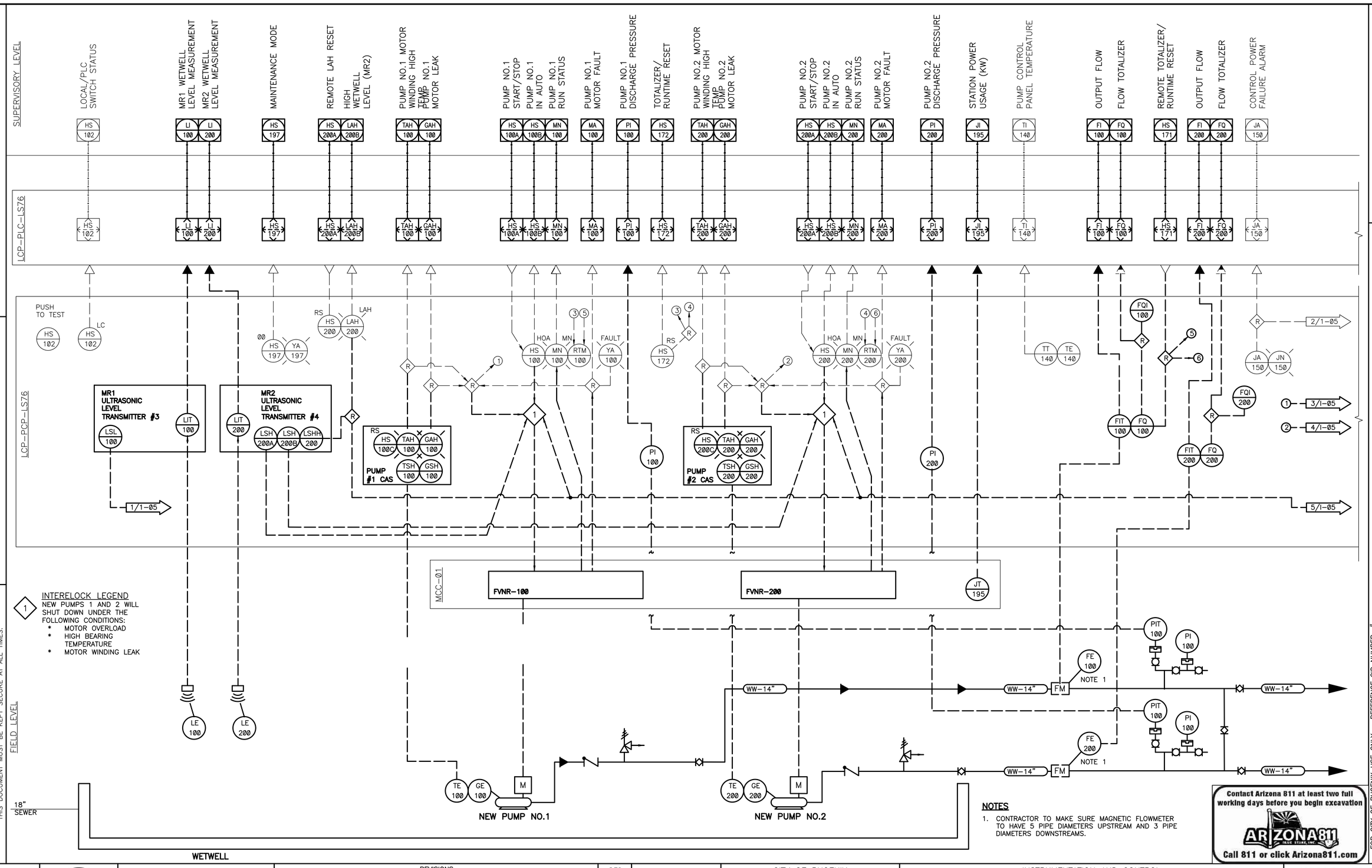

NOTES

1. CONTRACTOR TO MAKE SURE MAGNETIC FLOWMETER TO HAVE 5 PIPE DIAMETERS UPSTREAM AND 3 PIPE DIAMETERS DOWNSTREAMS.

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DWG NUMBER						

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CERTIFICATE NO.
77484
JOSEPH E DINKEL
Date Signed
ARIZONA, U.S.A.

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PHOENIX, AZ 85008

REVISIONS				
NO.	BY	DATE	CKD	REMARKS

DES AG
DWN MV
CKD DR

City of Phoenix

CITY OF PHOENIX
WATER SERVICES DEPARTMENT
COLLECTION SYSTEMS
REMOTE FACILITIES

INSTRUMENTATION AND CONTROL

LIFT STATION 76 PHASE II EXPANSION
NEW WET WELL P&ID

CITY PROJECT NO. WS90400067
DATE: MAY 2023
104 SHEET 37 OF 41
CAD FILE: 04276.05_104

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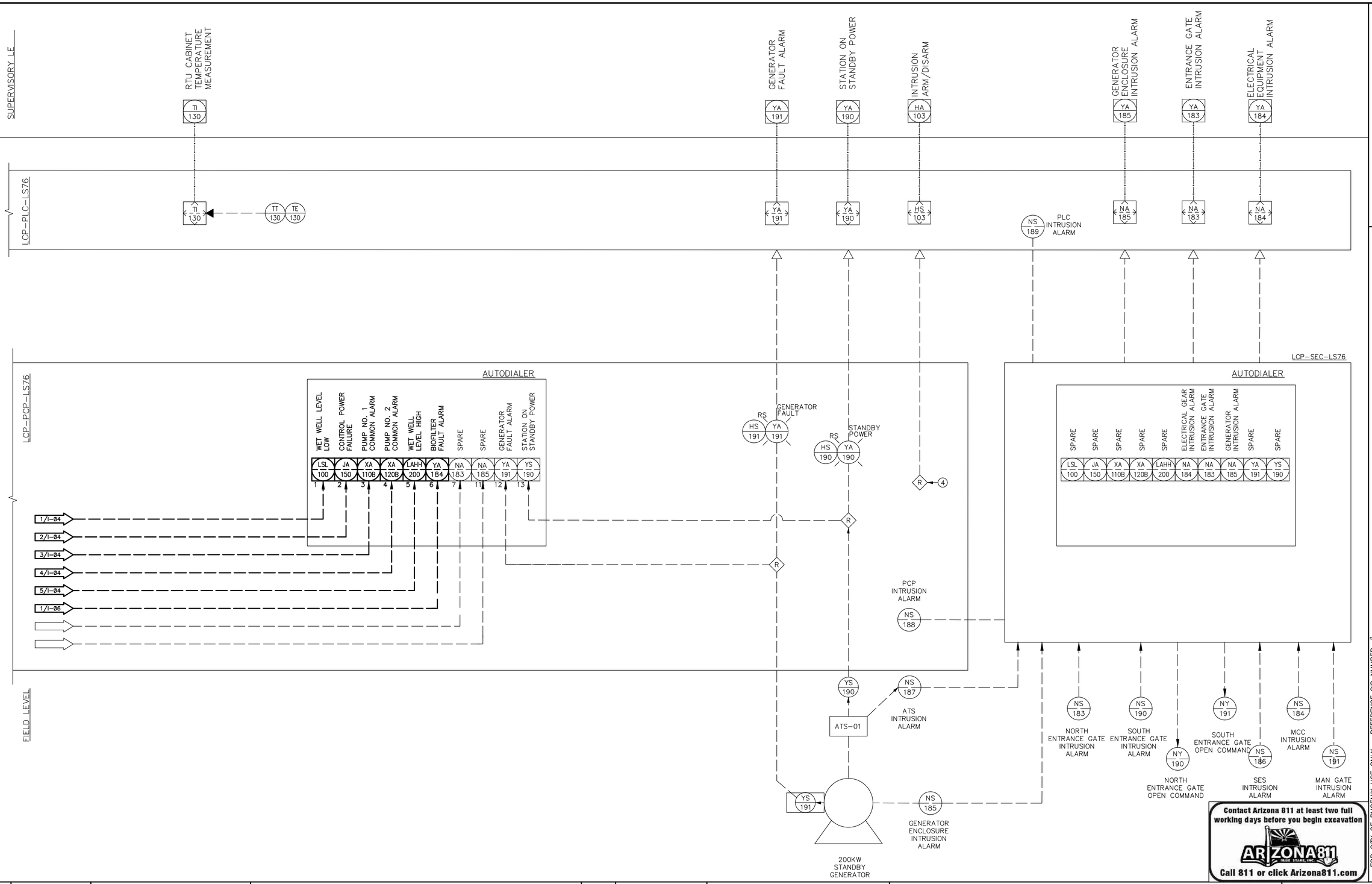

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REVISION	ENGINEERING COMPANY	PROJECT NO.	PROJECT NAME	DATE	CAD FILE NAME	DWG NUMBER	REMARKS
							-
							-
							-

Registered Professional Engineer
CERTIFICATE NO.
77484
JOSEPH E DINKEL
Date Signed
ARIZONA, U.S.A.

GREELEY AND HANSEN
2800 N. 44TH STREET, SUITE 650
PHOENIX, AZ 85008

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CITY OF PHOENIX
WATER SERVICES DEPARTMENT
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INSTRUMENTATION AND CONTROL

LIFT STATION 76 PHASE II EXPANSION
NEW WET WELL AUTODIALER P&ID

CITY PROJECT NO. WS90400067
DATE: MAY 2023
105 SHEET 38 OF 41
CAD FILE: 04276.05_105

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SUPERVISORY LEVEL

LCP-PLC-LS76

GREASE FILTER PRESSURE — PI 502
LCP-BIO-LS76 POWER FAILURE — JI 501
BIOFILTER BLOWER BLW-501 E-STOP — HS 501
BIOFILTER BLOWER BLW-501 RUN STATUS — MN 501
BIOFILTER BLOWER BLW-501 FAIL — YA 501
BIOFILTER BLOWER BLW-501 DIFFERENTIAL PRESSURE — PI 506
BIOFILTER BLOWER BLW-501 DISCHARGE PRESSURE — PI 507

LCP-BIO-LS76
PWR — JI 501
ESP — HS 501
START — HS 501
STOP — HS 501
MN 501
ETM — KI 501
YA 501
RST — HS 501A
I
R
01/I-5
TO AUTODIALER

MCC-01
480V
EA 501

BIOFILTER IRRIGATION CONTROLLER (RAINBIRD)
120V

S SOV-503
WATER SUPPLY

PDIT-506 — PDIT 506 (L, H)
PIT-507 — PIT 507
PI 505

FROM WETWELL
FA-XX"
PI 504
DPI 502
TSH 501
M
CS
LS-BLW-501 BIOFILTER BLOWER

DL-6"
TO BE DETERMINED

1 ELECTRICAL INTERLOCK LEGEND
THE PUMP WILL STOP IF THE FOLLOWING CONDITION EXISTS:
* MOTOR OVERLOAD
* HIGH TEMPERATURE
* EMERGENCY STOP WILL INHIBIT PUMP OPERATION

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REVISION	ENGINEERING COMPANY	PROJECT NO.	PROJECT NAME	DATE	CAD FILE NAME	DWG NUMBER	REMARKS

Registered Professional Engineer CERTIFICATE NO. 77484 JOSEPH E DINKEL Date Signed 4/30/23 ARIZONA, U.S.A.

GREELEY AND HANSEN
2800 N. 44TH STREET, SUITE 650
PHOENIX, AZ 85008

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CITY OF PHOENIX
WATER SERVICES DEPARTMENT
COLLECTION SYSTEMS
REMOTE FACILITIES

INSTRUMENTATION AND CONTROL

LIFT STATION 76 PHASE II EXPANSION
BIOFILTER P&ID

CITY PROJECT NO. WS90400067
DATE: MAY 2023
106 SHEET 39 OF 41
CAD FILE: 04276.05_106

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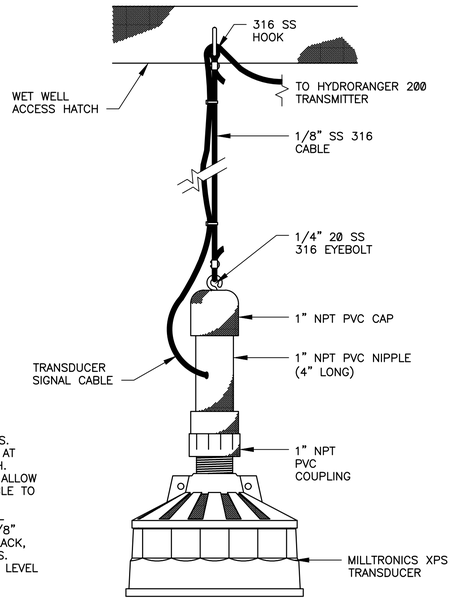
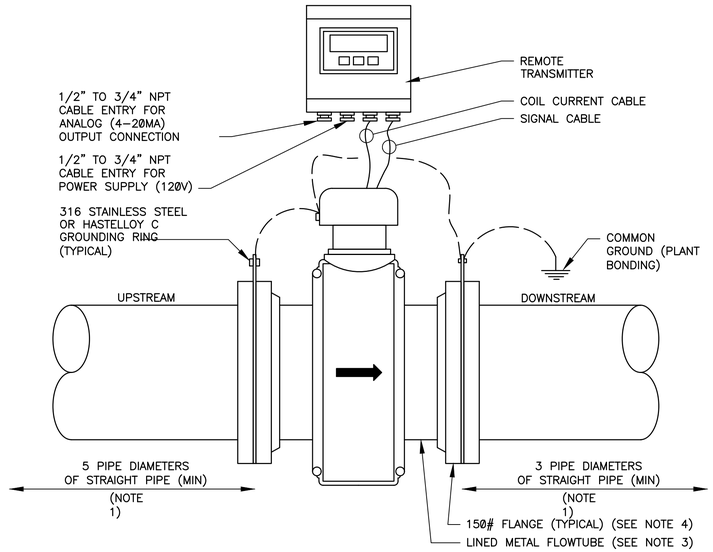


NOTES:
1. CABLE AND MOUNTING HARDWARE TO BE 316 SS.
2. 316 SS HOOK MOUNTED AT WET WELL ACCESS HATCH.
3. PVC NIPPLE DRILLED TO ALLOW TRANSDUCER SIGNAL CABLE TO PASS THROUGH.
4. BIND TRANSDUCER SIGNAL CABLE TO LENGTH OF 1/8" 316 SS CABLE USING BLACK, UV RESISTANT CABLE TIES.
5. DETAIL TYPICAL FOR TWO LEVEL TRANSDUCERS.

LEVEL ELEMENT INSTALLATION

DETAIL 2 | 107 | 107

SCALE = NOT TO SCALE



NOTES:
1. STRAIGHT PIPE RUN REQUIREMENTS APPLICABLE WITH THE METER MOUNTED IN ANY POSITION.
2. GROUNDING SHOWN IS TYPICAL FOR METAL PIPELINE INSTALLATIONS.
3. TUBE TO BE LINED OR COATED AS REQUIRED BY PROCESS CONDITIONS.
4. COORDINATE FLANGE PRESSURE RATING BASED ON PROCESS PIPING.
5. FOLLOW MANUFACTURER'S RECOMMENDED INSTALLATION PRACTICES. REQUIREMENTS MAY VARY.

MAGNETIC FLOW METER (REMOTE TRANSMITTER CONFIGURATION)

DETAIL 3 | 107 | 107

SCALE = NOT TO SCALE

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REVISION	ENGINEERING COMPANY	PROJECT NO.	PROJECT NAME	DATE	CAD FILE NAME	DWG NUMBER	REMARKS

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77484
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Date Signed
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CITY OF PHOENIX
WATER SERVICES DEPARTMENT
04276.05_107 – DETAILS

REMOTE FACILITIES

INSTRUMENTATION AND CONTROL

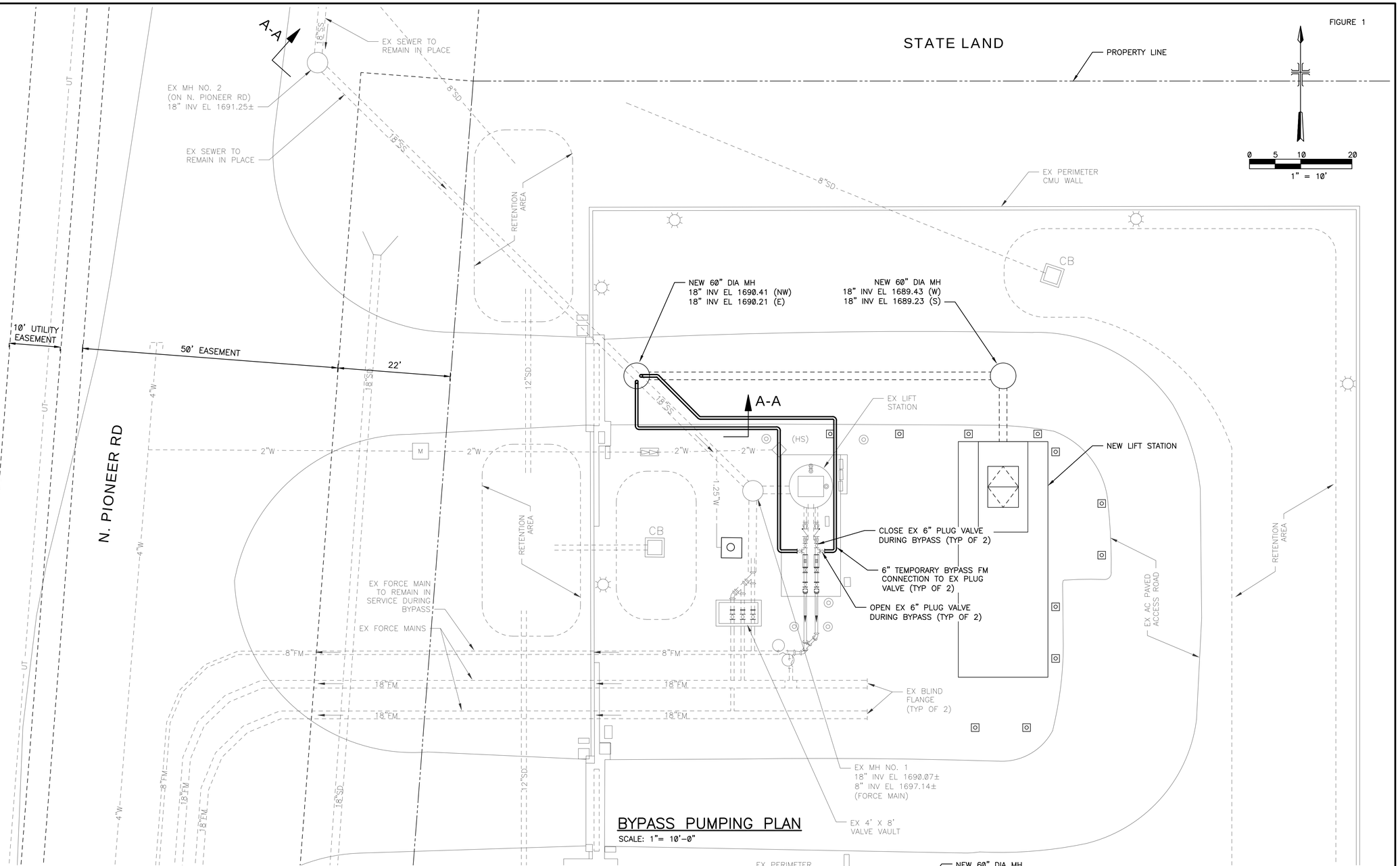
LIFT STATION 76 PHASE II EXPANSION DETAILS

CITY PROJECT NO. WS90400067
DATE: MAY 2023
107 SHEET 40 OF 41
CAD FILE: 04276.05_107

FIGURE 1

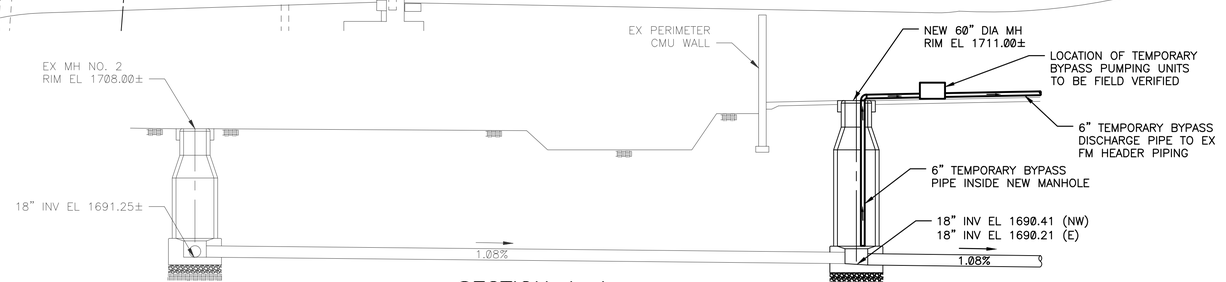
GENERAL NOTES:

1. BYPASS PUMPING DRAWING FOR INFORMATION PURPOSES ONLY, CONTRACTOR TO SUBMIT MAINTENANCE OF PROPOSED OPERATION BEFORE IMPLEMENTING ANY BYPASS WORK.
2. THE CONTRACTOR SHALL FIELD VERIFY THE POINT OF CONNECTION FOR THE TEMPORARY DISCHARGE PIPING.
3. THE CONTRACTOR SHALL REVIEW AND CONFIRM THE FEASIBILITY OF THE BYPASS APPROACH HEREIN, AND REVIEW WITH THE CITY AND ENGINEER PRIOR TO IMPLEMENTATION.
4. CONSTANT MONITORING SHALL BE PROVIDED FOR TEMPORARY BYPASS PUMPS, EQUIPMENT AND PRESSURIZED PIPELINE. PRESSURE TESTING OF THE BYPASS PIPE SHALL BE SUCCESSFULLY COMPLETED PRIOR TO IMPLEMENTATION.
5. THE ALIGNMENT OF THE TEMPORARY PIPING WILL BE CONFIRMED BY THE CONTRACTOR IN COORDINATION WITH FIELD CONDITIONS AND THE CONTRACTORS ON-SITE EQUIPMENT. TEMPORARY PIPING SHALL NOT INTERFERE WITH CONSTRUCTION, DEMOLITION, TESTING AND OPERATION OF THE LIFT STATION. THE CONTRACTOR SHALL TAKE FULL RESPONSIBILITY OF THE BYPASS PUMPING OPERATION AND ANY DELAYS THAT OCCUR AS A RESULT OF IMPROPER IMPLEMENTATION OF THE TEMPORARY BYPASS SYSTEM.
6. THE INTEGRITY OF ANY MANHOLES USED DURING THE BYPASS OPERATION SHALL NOT BE COMPROMISED, ANY DAMAGE SHALL BE REPAIRED AT NO ADDITIONAL COST TO THE CONTRACT. COATING SHALL BE RESTORED IN ACCORDANCE WITH CITY SPECIFICATIONS AND REQUIREMENTS IF DAMAGED.
7. TEMPORARY BYPASS SHALL REMAIN IN PLACE UNTIL THE NEW WET WELL, PUMPS, AND DISCHARGE FORCE MAIN HAVE ALL BEEN COMPLETELY INSTALLED, TESTED, AND ACCEPTED BY THE CITY. SWITCH OVER TO THE NEW LIFT STATION SHALL BE COORDINATED WITH THE CITY AT LEAST 7 DAYS PRIOR TO SCHEDULE FINAL SWITCH OVER.



BYPASS PUMPING PLAN

SCALE: 1"= 10'-0"



SECTION A-A TEMPORARY BYPASS

SCALE: 1"= 10'-0"

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PHOENIX, AZ 85008

X01 SHEET 41 OF 41

DECEMBER 2023
CITY OF PHOENIX
WATER SERVICES DEPARTMENT
LIFT STATION 76 PHASE II EXPANSION
PROJECT NO. WS90400067-4