CITY OF KEY WEST

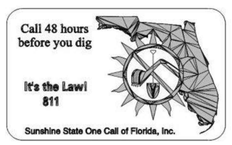
RICHARD A. HEYMAN
ENVIRONMENTAL PROTECTION FACILITY
RAS AND WAS PUMPS REPLACEMENT

CITY OF KEY WEST PROJECT NO : SE35042002

CITY OF KEY WEST ITB NO :

FEBRUARY 2023

100% SUBMITTAL



BLACK & VEATCH

Black & Veatch Corporation

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Coral Gables, FL 33134 Certificate No. 8132

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FD7000
D9000

GENERAL ANNOTATION, SYMBOL, AND CALLOUT LEGENDS

INDEX OF DRAWINGS

DISCIPLINE

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4	G-00-003	NOTES, LEGEND, ABBREVIATIONS AND LOCATION MAP
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7	D-10-301	OPERATIONS BUILDING SECTIONS
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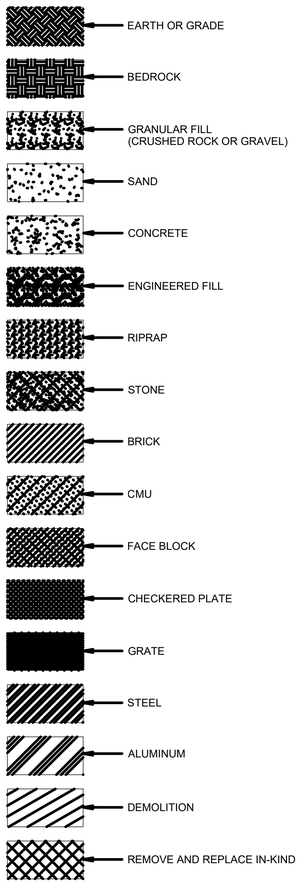
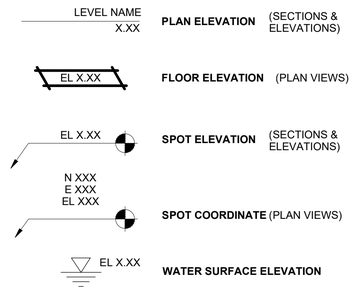
FILL PATTERNS

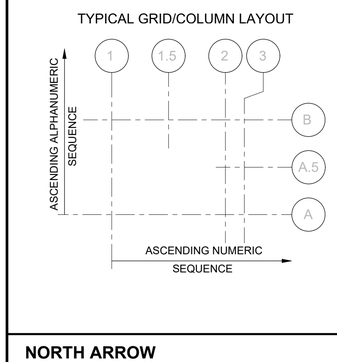


ELEVATION & GRID CALLOUTS

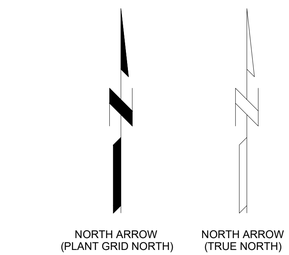
ELEVATION CALLOUTS



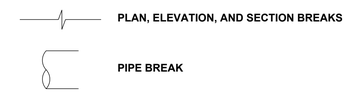
GRID/COLUMN CALLOUTS



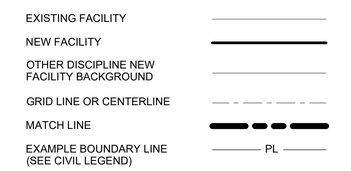
NORTH ARROW



BREAKS

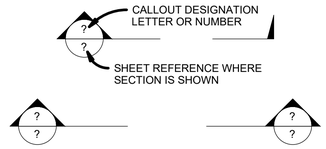


LINE STYLES

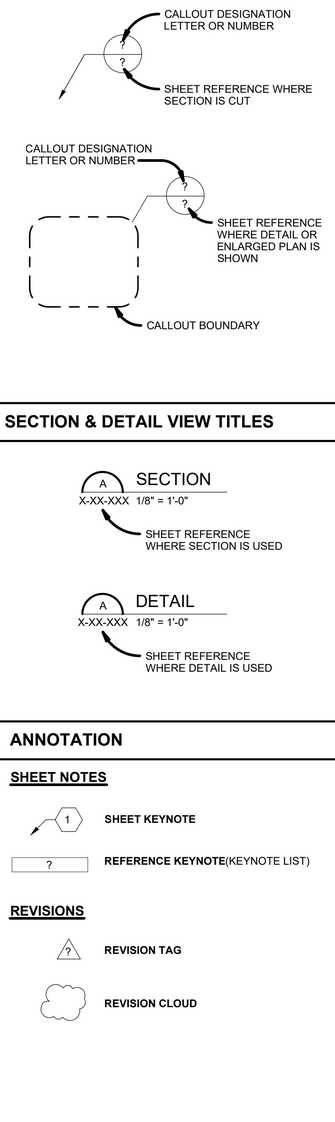


VIEW CALLOUTS

SECTION CALLOUTS



DETAIL/ENLARGED PLAN AREA CALLOUTS



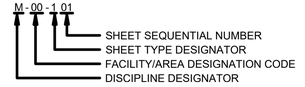
SECTION & DETAIL VIEW TITLES

ANNOTATION

SHEET NOTES

REVISIONS

DRAWING NUMBERING SYSTEM



DISCIPLINE DESIGNATORS

A	ARCHITECTURAL
C	CIVIL
D	DEMOLITION
E	ELECTRICAL
F	FIRE PROTECTION
G	GENERAL
H	HVAC/BUILDING MECHANICAL
I	INSTRUMENTATION AND CONTROLS
L	LANDSCAPE
M	PROCESS MECHANICAL
P	PLUMBING
S	STRUCTURAL

AREA/FACILITY DESIGNATION CODES

FACILITY / AREA CODE	FACILITY / AREA CODE
00	GENERAL (APPLIES TO ALL)
10	OPERATIONS BUILDING
20	AERATION BASINS WALKWAY
99	DETAILS

SHEET TYPE DESIGNATORS

0	GENERAL (SYMBOLS, LEGENDS, NOTES, ETC.)
1	PLANS (ARRANGEMENT PLANS, PARTIAL PLANS)
2	ELEVATIONS
3	SECTIONS
4	LARGE SCALE VIEWS (ENLARGED PLANS, STAIR SECTIONS OR SECTIONS THAT ARE NOT DETAILS)
5	DETAILS
6	SCHEDULES & DIAGRAMS
7	SCHEMATICS (ONE-LINES, BLOCK DIAGRAMS)
8	USER DEFINED
9	3D MODEL (PERSPECTIVES, ISOMETRICS, PHOTOGRAPHS)

NO.	BY	CHK	APP	DATE	REVISIONS AND RECORD OF USE
2	AD	PG	IB	02/01/2023	100% SUBMITTAL
1	AD	PG	IB	10/10/2022	90% SUBMITTAL
				09/28/2021	ISSUED FOR 60% SUBMITTAL

Date:
Engineer of Record:
Florida License No.:

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CITY OF KEY WEST
RICHARD A. HEYMAN
ENVIRONMENTAL PROTECTION FACILITY
RAS AND WAS PUMPS REPLACEMENT

GENERAL
LIST OF DRAWINGS, ANNOTATIONS & SYMBOL LEGENDS

DESIGNED:	MG
DETAILED:	HT , AD
CHECKED:	PG
APPROVED:	IB
DATE:	02/01/2023

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
409283

G-00-001
SHEET
2 OF 28

100% SUBMITTAL

FD:160522
D:409283

GENERAL, CIVIL, AND PROCESS MECHANICAL ABBREVIATIONS

A

AB	AGGREGATE BASE
ABV	ABOVE
AC	ASPHALT CONCRETE
ACP	ASBESTOS CEMENT PIPE
AD	AREA DRAIN, ANODE
ADD	ADDITIONAL
ADJ	ADJUSTABLE, ADJACENT
ADMIN	ADMINISTRATION
ADWF	AVERAGE DRY-WEATHER FLOW
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AH	AHEAD
ALT	ALTERNATE, ALTERNATIVE
ANC	ANCHOR
AP	ACCESS PANEL, ANGLE POINT
APPR	APPROACH
APPROX	APPROXIMATE, APPROXIMATELY
AR	ANCHOR ROD
ARCH	ARCHITECTURAL
ASSY	ASSEMBLY
ATM	ATMOSPHERE, ATMOSPHERIC
AUTO	AUTOMATIC
AUX	AUXILIARY
AVG	AVERAGE
AWG	AMERICAN WIRE GAUGE
AWWA	AMERICAN WATER WORKS ASSOCIATION
AWWF	AVERAGE WET-WEATHER FLOW

B

B	BORE HOLE
B TO B	BACK TO BACK
BAL	BALANCE
BC	BACK OF CURB
BET	BETWEEN
BF	BLIND FLANGE
BHP	BRAKE HORSEPOWER
BITUM	BITUMINOUS
BLDG	BUILDING
BLK	BLOCK
BM	BENCHMARK
BNR	BIOLOGICAL NUTRIENT REMOVAL
BOD	BIOLOGICAL/BIOCHEMICAL OXYGEN DEMAND
BOF	BOTTOM OF FOOTING
BOP	BOTTOM OF PIPE
BOT	BOTTOM
BP	BACK PRESSURE
BRG	BEARING
BS	BOTH SIDES
BU	BELL-UP
BVC	BEGINNING OF VERTICAL CURVE

C

C	CURVE
C TO C	CENTER TO CENTER
CB	CATCH BASIN
CF	CUBIC FEET
CFM	CUBIC FEET PER MINUTE
CFS	CUBIC FEET PER SECOND
C&G	CURB AND GUTTER
CIP	CAST IRON PIPE
CISP	CAST IRON SOIL PIPE
CL	CLASS
C/L	CENTERLINE
CLG	CEILING
CLR	CLEAR, CLEARANCE
CLSM	CONTROLLED LOW STRENGTH MATERIAL
CMC	CEMENT MORTAR COATED
CML	CEMENT MORTAR LINED
CMP	CORRUGATED METAL PIPE
CO	CLEAN OUT, COMPANY
COD	CHEMICAL OXYGEN DEMAND
COL	COLUMN
COMB	COMBINATION
COMB SWR	COMBINED SEWER
CONC	CONCRETE
CONN	CONNECTION
CONST	CONSTRUCTION
CONT	CONTINUED, CONTINUOUS, CONTINUATION, CONTROL
CONTR	CONTRACTOR
COR	CORNER
CORR	CORRIDOR, CORRUGATED
CP	CONTROL POINT, CATHODIC PROTECTION, CATCH POINT
CPLG	COUPLING
CPVC	CHLORINATED POLYVINYL CHLORIDE
CSP	CORRUGATED STEEL PIPE
CTR(S)	CENTER(S)
CTS	CORROSION/CATHODIC TEST STATION
CU	CUBIC, COPPER
CY	CUBIC YARD

D

D	DOOR
DB	DUCT BANK
DBL	DOUBLE
DEG	DEGREE
DEPT	DEPARTMENT
DET	DETAIL
DI	DROP INLET, DUCTILE IRON
DIA	DIAMETER
DIFF	DIFFUSER
DIM	DIMENSION
DIP	DUCTILE IRON PIPE
DISCH	DISCHARGE
DIST	DISTRIBUTION
DIV	DIVISION
DMJ	DISMANTLING JOINT
DN	DOWN
DR	DRAIN
DW	DRY WELL
DWG(S)	DRAWING(S)

E

E	EAST, EASTING
EA	EACH
ECC	ECCENTRIC
ECC RED	ECCENTRIC REDUCER
EFF	EFFLUENT, EFFICIENCY
EG	EXISTING GRADE
EJ	EXPANSION JOINT
EL	ELEVATION
ELB	ELBOW
ELL	ELBOW
ELEC	ELECTRIC, ELECTRICAL
EMER	EMERGENCY
ENC	ENCASEMENT
ENCL	ENCLOSURE
EOL	END OF LINE
EOP	EDGE OF PAVEMENT
EOS	EDGE OF SLAB
EQ	EQUAL
EQUIP	EQUIPMENT
EVC	END OF VERTICAL CURVE
EW	EACH WAY
EXH	EXHAUST
EXIST	EXISTING
EXP	EXPANSION, EXPOSED
EXT	EXTENSION, EXTERIOR, EXTERNAL

F

F	FAHRENHEIT, FACE
F TO F	FACE TO FACE
FAB	FABRICATE(D)(TION)
FC	FACE OF CONCRETE, FAIL CLOSED
FCA	FLANGED COUPLING ADAPTER
FD	FLOOR DRAIN
FF	FINISHED FLOOR
FG	FINISHED GRADE
FH	FIRE HYDRANT
FIG	FIGURE
FL	FLOOR, FLOW LINE
FLEX	FLEXIBLE
FLG	FLANGE(D)
FM	FORCE MAIN
FMH	FLEXIBLE METAL HOSE
FO	FAIL OPEN
FOB	FLAT ON BOTTOM
FOM	FACE OF MASONRY
FOT	FLAT ON TOP
FPS	FEET PER SECOND
FRP	FIBERGLASS REINFORCED PLASTIC
FS	FAR SIDE, FLOOR SLEEVE
FT	FOOT, FEET
FTG	FOOTING
FURN	FURNISH, FURNISHED
FWD	FORWARD

G

G	GAS
GA	GAUGE
GAL	GALLON
GALV	GALVANIZED
GB	GRADE BREAK
GC	GROOVED COUPLING
GEN	GENERAL, GENERATOR
GL	GLASS
GM	GAS METER
GPD	GALLONS PER DAY
GPM	GALLONS PER MINUTE
GR	GRADE

H

H	HIGH, HOUR
HDG	HOT-DIPPED GALVANIZED
HDPE	HIGH DENSITY POLYETHYLENE
HEX	HEAT EXCHANGER
HGT	HEIGHT
HH	HANDHOLE
HMC	HARNESSED MECHANICAL COUPLING
HMJ	HARNESSED MECHANICAL JOINT
HORIZ	HORIZONTAL
HP	HIGH POINT, HIGH PRESSURE, HORSEPOWER
HR	HOUR, HANDRAIL
HS	HIGH STRENGTH
HVAC	HEATING, VENTILATING AND AIR CONDITIONING
HWY	HIGHWAY
HYDRO	HYDROPNEUMATIC, HYDROGENERATION

I

ID	INSIDE DIAMETER
IE	INVERT ELEVATION
IF	INSIDE FACE
IN	INCH(ES)
INCL	INCLUDING
INCR	INCREASE
INST	INSTRUMENT, INSTRUMENTATION
INSUL	INSULATE, INSULATED, INSULATING
INT	INTERIOR, INTERNAL
INV	INVERT
IPS	IRON PIPE SIZE

J

JB	JUNCTION BOX
JT	JOINT

K

KVA	KILOVOLT AMPERE

L

L	LENGTH, LONG, LOW
LAT	LATERAL, LATITUDE
LB(S)	POUND(S)
LC	LENGTH OF CURVE
LF	LINEAR FEET
LH	LEFT HAND
LIN	LINEAL, LINEAR
LONG	LONGITUDE
LP LOW	POINT, LOW PRESSURE
LT	LEFT

M

MAINT	MAINTENANCE
MAN	MANUAL(LY)
MAX	MAXIMUM
MBR	MEMBRANE BIOREACTOR
MC	MECHANICAL COUPLING
MECH	MECHANICAL
MED	MEDIUM
MF	MICROFILTRATION
MFR	MANUFACTURER
MG	MILLION GALLONS
MG/L	MILLIGRAMS PER LITER
MGD	MILLION GALLONS PER DAY
MH	MAINTENANCE HOLE, MANHOLE
MIN	MINIMUM, MINUTE
MISC	MISCELLANEOUS
MJ	MECHANICAL JOINT
MJRG	MECHANICAL JOINT RETAINER GLAND
MJTR	MECHANICAL JOINT WITH TIE ROD
MO	MOTOR OPERATED
MSL	MEAN SEA LEVEL
MTD	MOUNTED
MTL	MATERIAL
MTR	MOTOR
MW	MONITORING WELL

N

N	NORTH, NORTHING, NITROGEN (TOTAL AS N)
N/A	NOT APPLICABLE
NAD	NORTH AMERICAN DATUM (HORIZONTAL)
NAVD	NORTH AMERICAN VERTICAL DATUM
NC	NORMALLY CLOSED
NF	NEAR FACE
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NO.	NUMBER(S)
NOM	NOMINAL
NPSH	NET POSITIVE SUCTION HEAD
NPSHR	NET POSITIVE SUCTION HEAD REQUIRED
NPT	NATIONAL PIPE THREAD
NRS	NON-RISING STEM
NS	NEAR SIDE
NTS	NOT TO SCALE

O

OC	ON CENTER, ODOR CONTROL
OD	OUTSIDE DIAMETER
OF	OUTSIDE FACE, OVERFLOW
OH	OVERHEAD
OPER	OPERATING
OPNG	OPENING
OPP	OPPOSITE
OZ	OUNCE

P

P&ID	PIPING/PROCESS AND INSTRUMENTATION DIAGRAM
P	PHOSPHORUS (TOTAL AS P)
PPM	PARTS PER MILLION
PC	POINT OF CURVATURE
PCC	POINT OF COMPOUND CURVATURE
PCCP	PRESTRESSED CONCRETE CYLINDER PIPE
PE	PLAIN END
PG	PRESSURE GAUGE
PH	PIPE HANGER
PI	POINT OF INTERSECTION
PNL(S)	PANEL(S), PANELBOARD(S)
POC	POINT ON CIRCULAR CURVE, POINT OF CONNECTION
POT	POINT ON TANGENT
PP	POWER POLE
PROJ	PROJECTION
PRS	PRESSURE REDUCING STATION
PS	PIPE SUPPORT
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PSIA	POUNDS PER SQUARE INCH ABSOLUTE
PSIG	POUNDS PER SQUARE INCH GAUGE
PT	POINT OF TANGENCY, POINT
PVC	POLYVINYL CHLORIDE, POINT OF VERTICAL CURVATURE
PVT	POINT OF VERTICAL TANGENCY
PVCP	POLYVINYL CHLORIDE PIPE
PVI	POINT OF VERTICAL INTERSECTION
PVMT	PAVEMENT

Q

Q	RATE OF FLOW
QCPLG	QUICK COUPLING

R

R	RADIUS, RISER
R/W	RIGHT OF WAY
RCP	REINFORCED CONCRETE PIPE
RCCP	REINFORCED CONCRETE CYLINDER PIPE
RECIRC	RECIRCULATING
RED	REDUCER, REDUCING
REF	REFERENCE
REINF	REINFORCED, REINFORCING
REM	REMOVABLE, REMOVE
REQD	REQUIRED
RET	RETURN
REV	REVISION, REVISED, REVERSED
RH	RIGHT HAND
RO	REVERSE OSMOSIS
RPM	REVOLUTIONS PER MINUTE
RR	RAILROAD
RS	RISING STEM
RT	RIGHT
ROW	RIGHT OF WAY

S

S	SECOND, SLOPE, SOUTH
SCHED	SCHEDULE
SCFM	STANDARD CUBIC FEET PER MINUTE
SD	STORM DRAIN
SEC	SECOND
SECT	SECTION
SF	SQUARE FEET
SH	SHEET
SIM	SIMILAR
SP	STEEL PIPE
SPA	SPACING, SPACES
SPEC(S)	SPECIFICATION(S)
SPL	SPECIAL
SPLY	SUPPLY
SQ	SQUARE
SS	STAINLESS STEEL
SS	SANITARY SEWER
ST SWR	STORM SEWER
STA	STATION
STD	STANDARD
STL	STEEL
STOR	STORAGE
STR	STRUCTURAL
SUSP	SUSPENDED
SYM	SYMMETRICAL
SYS	SYSTEM

T

T	TELEPHONE, TOP
TAN	TANGENT
TBC	TOP BACK OF CURB
TBD	TO BE DETERMINED
TBM	TEMPORARY BENCHMARK
TC	TOP OF CURB
TDS	TOTAL DISSOLVED SOLIDS
TEMP	TEMPERATURE, TEMPORARY
TH	TEST HOLE
THD	THREADED
THK	THICK, THICKNESS
TOC	TOP OF CONCRETE, TABLE OF CONTENTS, TOTAL ORGANIC CARBON
TOF	TOP OF FOOTING
TOM	TOP OF MASONRY
TOP	TOP OF PIPE
TOW	TOP OF WALL
TP	TEST PIT
TRANS	TRANSFORMER
TS	TOTAL SOLIDS
TSS	TOTAL SUSPENDED SOLIDS
TYP	TYPICAL

U

UB	UTILITY BOX
UF	ULTRAFILTRATION
UG	UNDERGROUND
UNO	UNLESS NOTED OTHERWISE
UP	UTILITY POLE
USGS	UNITED STATES GEOLOGICAL SURVEY
UV	ULTRAVIOLET

V

V	VALVE (SEE P&ID ABBREVIATIONS), VERTICAL, VOLT, VENT
VAC	VACUUM
VB	VALVE BOX
VC	VERTICAL CURVE
VCP	VITRIFIED CLAY PIPE
VERT	VERTICAL
VIF	VERIFY IN FIELD
VOCs	VOLATILE ORGANIC COMPOUNDS
VP	VAPOR PRESSURE

W

W	WEST, WIDE, WATER
W/	WITH
WC	WATER COLUMN
WEF	WATER ENVIRONMENT FEDERATION
W	WATER LEVEL
WM	WATER METER
W/O	WITHOUT
WP	WATERPROOF
WS	WATERSTOP
WS	WATER SURFACE
WSL	WATER SURFACE LEVEL
WT	WEIGHT
WW	WETWELL

X

x	BY, TIMES

Y

YH	YARD HYDRANT

NOTES:

1. FOR EQUIPMENT ABBREVIATIONS, INCLUDING FOR VALVES, REFER TO P&ID LEGEND AND ABBREVIATIONS DRAWINGS FUNCTION CODE ABBREVIATIONS.
2. FOR SYSTEM AND PROCESS STREAM ABBREVIATIONS, REFER TO P&ID LEGEND AND ABBREVIATIONS DRAWINGS SYSTEM CODE AND PROCESS CODE ABBREVIATIONS.
3. FOR PIPE MATERIAL AND INSULATION MATERIAL ABBREVIATIONS REFER TO P&ID LEGEND AND ABBREVIATIONS DRAWINGS PIPELINE MATERIAL CODE AND INSULATION MATERIAL CODE ABBREVIATIONS.

NO.	DATE	REVISIONS AND RECORD OF USE	BY	CHK	APP
	02/01/2023	100% SUBMITTAL			
2	10/10/2022	95% SUBMITTAL	AD	PG	IB
1	09/29/2021	ISSUED FOR 90% SUBMITTAL	AD	PG	IB

Date:
Engineer of Record:
Florida License No.:

BLACK & VEATCH
Black & Veatch Corporation
2121 Ponce de Leon Boulevard, Suite 305
Coral Springs, FL 33134
Certificate No. 8132

CITY OF KEY WEST
RICHARD A. HEYMAN
ENVIRONMENTAL PROTECTION FACILITY
RAS AND WAS PUMPS REPLACEMENT

GENERAL
GENERAL, CIVIL, AND PROCESS MECHANICAL ABBREVIATIONS

DESIGNED: MG
DETAILED: HT , AD
CHECKED: PG
APPROVED: IB
DATE: 02/01/2023

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
409283

G-00-002
SHEET
3 OF 28

100% SUBMITTAL

FD1106022
D409283

GENERAL NOTES

1. ALL CONSTRUCTION MATERIALS AND TESTING SHALL CONFORM TO THE APPLICABLE SPECIFICATIONS OF THE CITY OF KEY WEST, LOCAL, MONROE COUNTY, STATE OF FLORIDA, AND NATIONAL CODES.

2. IF SPECIFICATIONS OR DRAWINGS CONFLICT, CONTRACTOR SHALL NOTIFY THE CITY OF KEY WEST FOR MORE INFORMATION PRIOR TO PROCEEDING WITH THE WORK.

3. REVIEW OF THE SHOP DRAWINGS BY THE CITY OF KEY WEST OR AUTHORIZED REPRESENTATIVE IS ONLY FOR CONFORMANCE WITH THE DESIGN CONCEPT OF THE PROJECT AND COMPLIANCE WITH THE INFORMATION GIVEN IN THE CONTRACT DOCUMENTS. THE CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS TO BE CONFIRMED AND CORRELATED AT THE SITE FOR INFORMATION THAT PERTAINS SOLELY TO THE FABRICATION, PROCESSES, OR TO THE MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES OF CONSTRUCTION AND FOR COORDINATION OF THE WORK OF ALL TRADES.

4. "SCREENED" (LIGHT) DELINEATION INDICATED ON THE DRAWINGS DENOTES EXISTING FACILITIES. "SCREENED" INFORMATION IS FOR REFERENCE ONLY, AND SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO THE ORDERING OF MATERIALS AND BEGINNING OF CONSTRUCTION. "BOLD" DELINEATION IS NEW WORK TO BE CONSTRUCTED UNDER THIS CONTRACT.

5. EXISTING UTILITIES AND STRUCTURES (UNDERGROUND, SURFACE, OR OVERHEAD) ARE INDICATED ONLY TO THE EXTENT THAT SUCH INFORMATION WAS KNOWN, OR MADE AVAILABLE TO, OR DISCOVERED BY THE ENGINEER IN PREPARING THE DRAWINGS. THE LOCATIONS, CONFIGURATIONS, AND ELEVATIONS OF SUBSURFACE FACILITIES AND UTILITIES ARE APPROXIMATE, AND NOT ALL UTILITIES AND FACILITIES MAY BE INDICATED.

UTILITY NOTES

1. CALL BEFORE YOU DIG. CONTRACTOR SHALL VERIFY PRECISE LOCATIONS AND ELEVATIONS OF ALL UTILITIES AND STRUCTURES, WHETHER INDICATED ON THE DRAWINGS OR NOT, IN THE FIELD IN ADVANCE OF EXCAVATING. THE CONTRACTOR SHALL CONTACT FLORIDA SUNSHINE ONE TO VERIFY UNDER GROUND UTILITIES WITHIN THE PROJECT SITE. THE FLORIDA SUNSHINE ONE TELEPHONE NUMBER IS 811.

2. CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVAL, DEMOLITION, RECONSTRUCTION, AND RECONNECTION OF EXISTING FACILITIES AS REQUIRED TO COMPLETE THE WORK. IF REQUIRED AFTER FIELD VERIFICATION, CONTRACTOR SHALL COORDINATE WITH THE ENGINEER TO DETERMINE ANY NECESSARY MODIFICATIONS TO THE PROPOSED NEW WORK.

3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COST OF REPAIRING ALL DAMAGED UTILITIES.

4. BEFORE CONSTRUCTION IS STARTED, CONTRACTOR SHALL COORDINATE WITH THE OWNER OF EACH UTILITY AND DEFINE THE REQUIREMENTS AND METHODS TO ACCOMMODATE THE PROTECTION, TEMPORARY SUPPORT, ADJUSTMENT, OR RELOCATION OF ANY UTILITIES AFFECTED BY THE PROPOSED NEW WORK.

CIVIL NOTES

1. ALL EXISTING FEATURES TO REMAIN UNLESS OTHERWISE NOTED ON THE DRAWINGS.

2. CONTRACTOR SHALL COMPLY WITH THE GOVERNING AGENCY NPDES CONSTRUCTION REQUIREMENTS, AND SHALL PROVIDE APPROPRIATE MITIGATION MEASURES OR PROTECTION AND RESTORATION AT ALL LOCATIONS AS REQUIRED BY THEIR OPERATIONS, AND AS DIRECTED BY THE ENGINEER. CONTRACTOR SHALL BE RESPONSIBLE FOR EROSION AND SEDIMENT CONTROL DURING CONSTRUCTION. CONTRACTOR SHALL MAINTAIN AND REPAIR EROSION AND SEDIMENT CONTROL DEVICES THROUGHOUT THE DURATION OF CONSTRUCTION.

3. CLEAR THE SITE USING STANDARD CLEARING AND GRUBBING PROCEDURES.

4. SOD ALL DISTURBED AREAS.

5. CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL AND DISPOSAL OF ANY CONSTRUCTION DEBRIS TO AN APPROVED FACILITY.

6. CONTRACTOR SHALL USE CAUTION WHEN WORKING NEAR OVERHEAD OR UNDER GROUND UTILITIES.

7. CONTRACTOR SHALL PROTECT AND MAINTAIN ALL EXISTING TREES, SHRUBS, AND PLANTS UNLESS OTHERWISE NOTED.

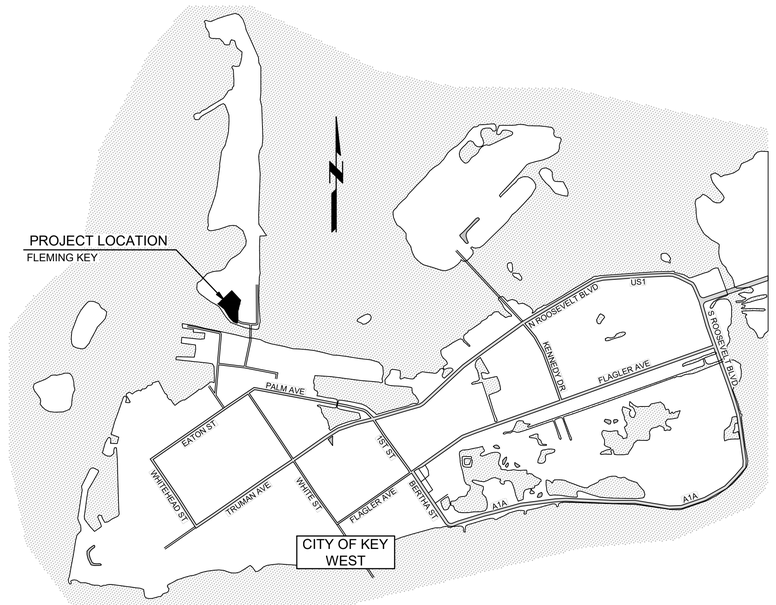
8. FINISHED GRADE ELEVATION AT ANY STRUCTURE, WHERE NOT ADJACENT TO PAVEMENT, SHALL BE APPROXIMATELY 6 INCHES BELOW FINISHED FLOOR ELEVATION UNLESS OTHERWISE NOTED.

9. THE CONTRACTOR'S OPERATIONS SHALL CONFORM TO THE RULES AND REGULATIONS OF THE STATE CONSTRUCTION SAFETY ORDERS PERTAINING TO EXCAVATION AND TRENCHING.

10. IF ANY SIGNAGE IS DEMOLISHED OR DAMAGED DURING CONSTRUCTION THE CONTRACTOR WILL REPLACE IT IN KIND PER CITY OF KEY WEST SPECIFICATIONS.

ABBREVIATIONS

@	AT
ABDN	ABANDON
BOT	BOTTOM
CB	CATCH BASIN
CLDIP	CEMENT LINED DUCTILE IRON PIPE
CONC	CONCRETE
CPE	CORRUGATED POLYETHYLENE
DF	DRAINAGE FORCE MAIN
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
DR	DRIVE, DIMENSION RATIO
DRN	DRAIN
E	EAST
EL	ELEVATION
EW	EACH WAY
EX, EXST	EXISTING
FL	FLANGE
FM	FORCE MAIN
GLDIP	GLASS LINED DUCTILE IRON PIPE
HORIZ	HORIZONTAL
INV	INVERT
IP	IRON POST
LT	LEFT
MAX	MAXIMUM
MH	MANHOLE
MIN	MINIMUM
MJ	MECHANICAL JOINT
N	NORTH
NO.	NUMBER
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTSIDE DIAMETER
PL	PROPERTY LINE
PP	POWER POLE
PVC	POLYVINYLCHLORIDE
RCP	REINFORCED CONCRETE PIPE
REQD	REQUIRED
RJ	RESTRAINED JOINT
RT	RIGHT
R/W	RIGHT OF WAY
S	SOUTH, SANITARY
SD	STORM DRAIN
SDR	STANDARD DIMENSION RATIO
SPECD	SPECIFIED
SS	STORM SEWER
SS, SST	STAINLESS STEEL
STA	STATION
STW	STORMWATER
T, TEL	TELEPHONE
TYP	TYPICAL
W	WEST, WATER
WT	WEIGHT



LOCATION MAP
NO SCALE

100% SUBMITTAL

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D4I9283

NO.	BY	CHK	APP	DATE	REVISIONS AND RECORD OF USE
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2	AD	PG	IB	10/10/2022	95% SUBMITTAL
1	AD	PG	IB	09/28/2021	ISSUED FOR 60% SUBMITTAL

Date:
Engineer of Record:
Florida License No.:

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Black & Veatch Corporation
2121 Ponce de Leon Boulevard, Suite 305
Coral Springs, FL 33134
Certificate No. 8132

CITY OF KEY WEST
RICHARD A. HEYMAN
ENVIRONMENTAL PROTECTION FACILITY
RAS AND WAS PUMPS REPLACEMENT

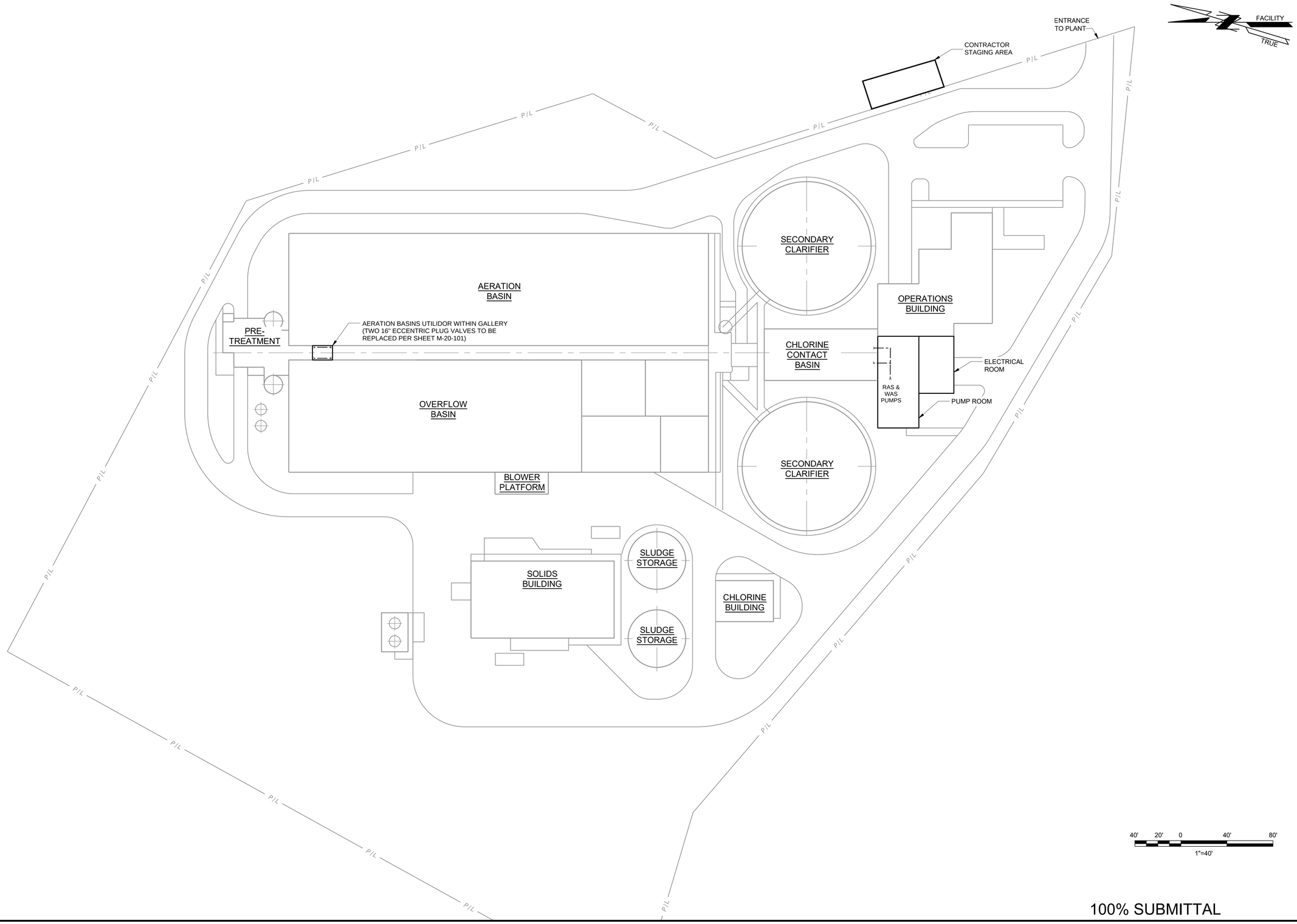
GENERAL
NOTES, LEGEND, ABBREVIATIONS
AND LOCATION MAP

DESIGNED: MG
DETAILED: HT , AD
CHECKED: PG
APPROVED: IB
DATE: 02/01/2023

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
409283

G-00-003
SHEET
4 OF 28



100% SUBMITTAL

NO.	BY	CHK	APP	DATE	REVISIONS AND RECORD OF USE
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2	AD	PG	IB	10/10/2022	95% SUBMITTAL
1	AD	PG	IB	09/28/2021	ISSUED FOR 90% SUBMITTAL

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Certificate No. 8132

CITY OF KEY WEST
RICHARD A. HEYMAN
ENVIRONMENTAL PROTECTION FACILITY
RAS AND WAS PUMPS REPLACEMENT

CIVIL
OVERALL SITE PLAN

DESIGNED:	MG
DETAILED:	HT, AD
CHECKED:	PG
APPROVED:	IB
DATE:	02/01/2023

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PROJECT NO.
409283

C-00-102
SHEET
5 OF 28

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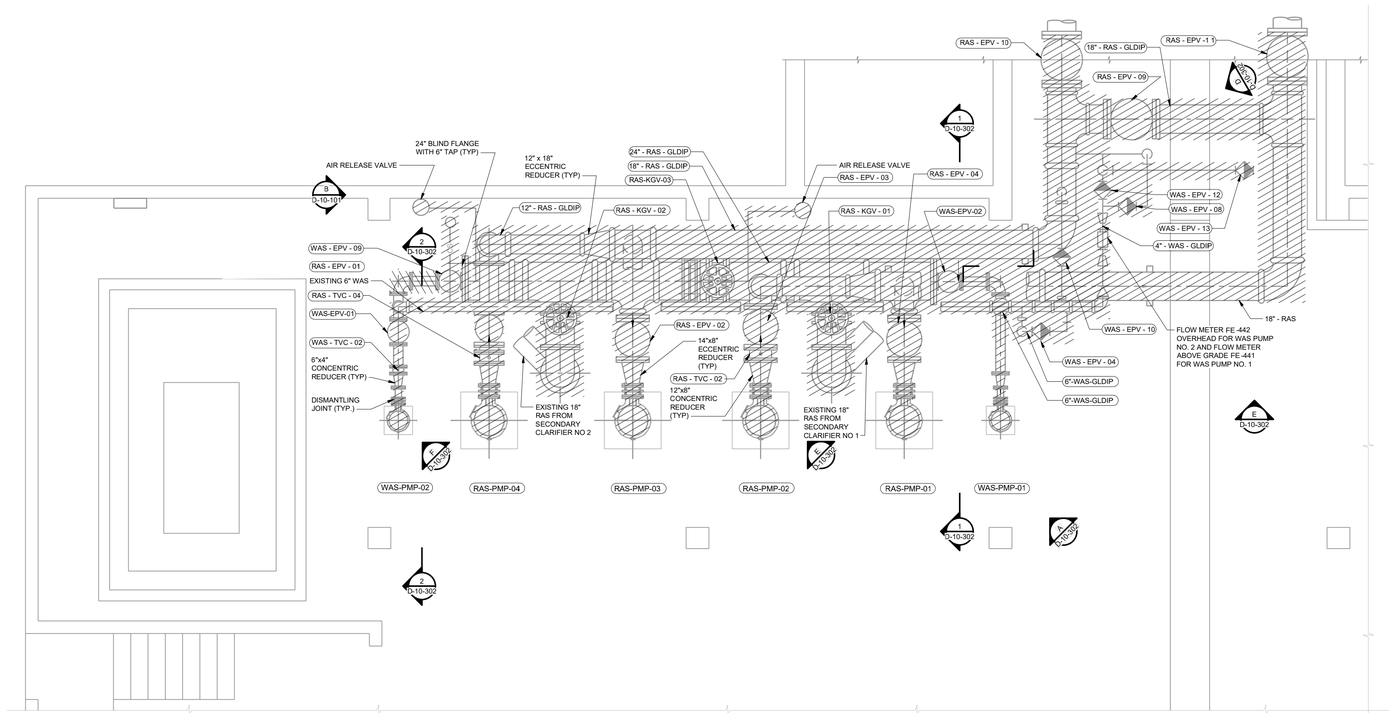
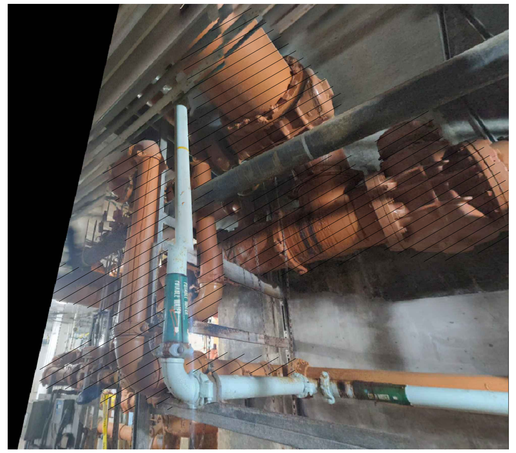


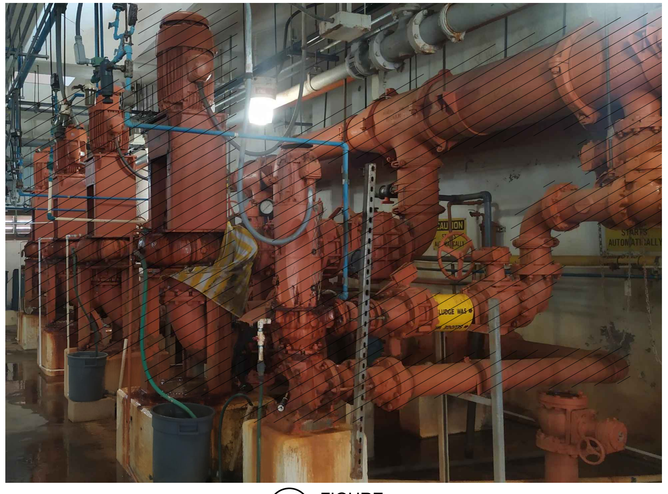
PUMP ROOM DEMOLITION PLAN
1/4" = 1'-0"

NOTES:

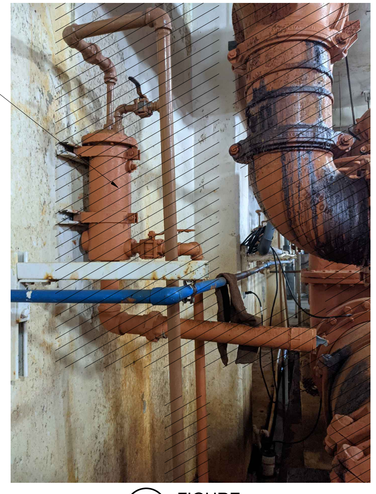
1. PLANS DO NOT NECESSARILY REPRESENT THE ACTUAL SYSTEM CONFIGURATION AND ALL ITEMS REQUIRING DEMOLITION, REMOVAL, OR PATCHING. ALL DEMOLITION, REMOVAL, CUTTING, PATCHING, AND OTHER WORK NECESSARY TO ACCOMMODATE NEW CONSTRUCTION SHALL BE INCLUDED IN THE CONTRACT AT NO ADDITIONAL COST TO OWNER.
2. CONTRACTOR TO FIELD CHECK EXISTING DIMENSIONS AND PIPING SYSTEM COMPONENTS INCLUDING PIPING, VALVES, SUPPORTS AND FITTINGS REQUIRED PRIOR TO DEMOLITION AND REPLACEMENT.
3. EXISTING PUMP BASES AND CONCRETE PEDESTALS TO REMAIN.
4. EXISTING METAL PIPE SUPPORTS TO BE REPLACED AT EXISTING LOCATIONS EXCEPT WHERE SUPPORT IS SUPPORTING OTHER STRUCTURES NOT INCLUDED IN THIS PROJECT.
5. EXISTING SEAL WATER AND CHLORINE PIPING SHALL BE DEMOLISHED AND CAPPED AT SOURCE HEADER PIPE.
6. ALL WORK ASSOCIATED WITH OTHER UTILITIES AND ELECTRICAL CONDUITS AND REQUIRED FOR THE DEMOLITION AND REPLACEMENT OF THE PIPING SYSTEM WILL BE PROVIDED BY CONTRACTOR AT NO ADDITIONAL COST TO OWNER. SUCH WORK MAY INCLUDE TEMPORARY SUPPORT, RELOCATION, DISCONNECT, BY-PASS SYSTEMS, ETC. AND IS NOT SHOWN ON THESE DRAWINGS OR SPECIFIED.



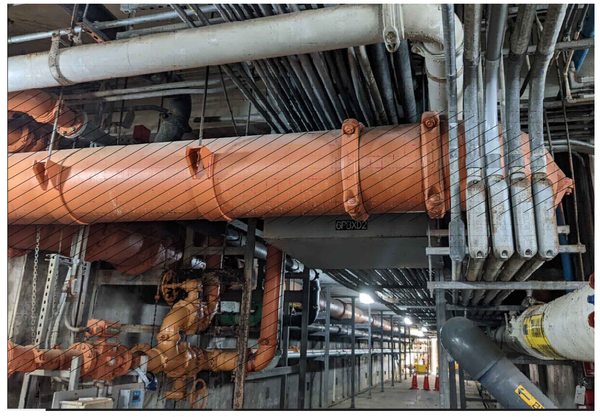
D FIGURE
NTS



A FIGURE
NTS



B FIGURE
NTS



C FIGURE
NTS

4' 2' 0 4' 8'
1/4"=1'-0"

100% SUBMITTAL

NO.	DATE	REVISIONS AND RECORD OF USE	BY	CHK	APP
	02/01/2023	100% SUBMITTAL		PG	IB
	10/10/2022	95% SUBMITTAL	2	AD	IB
	09/28/2021	ISSUED FOR 60% SUBMITTAL	1	AD	PG

Date:
Engineer of Record:
Florida License No.:

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Certificate No. 8132

CITY OF KEY WEST
RICHARD A. HEYMAN
ENVIRONMENTAL PROTECTION FACILITY
RAS AND WAS PUMPS REPLACEMENT

DEMOLITION
OPERATIONS BUILDING PUMP ROOM PLAN - EL 3.00

DESIGNED: MG
DETAILED: HT, AD
CHECKED: PG
APPROVED: IB
DATE: 02/01/2023

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
409283

D-10-101
SHEET
6 OF 28

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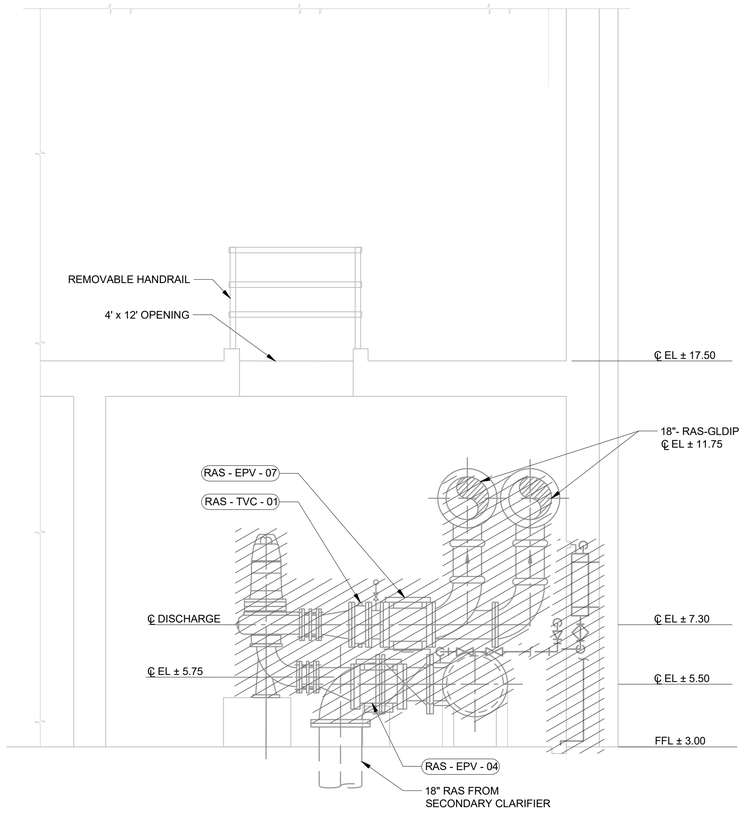
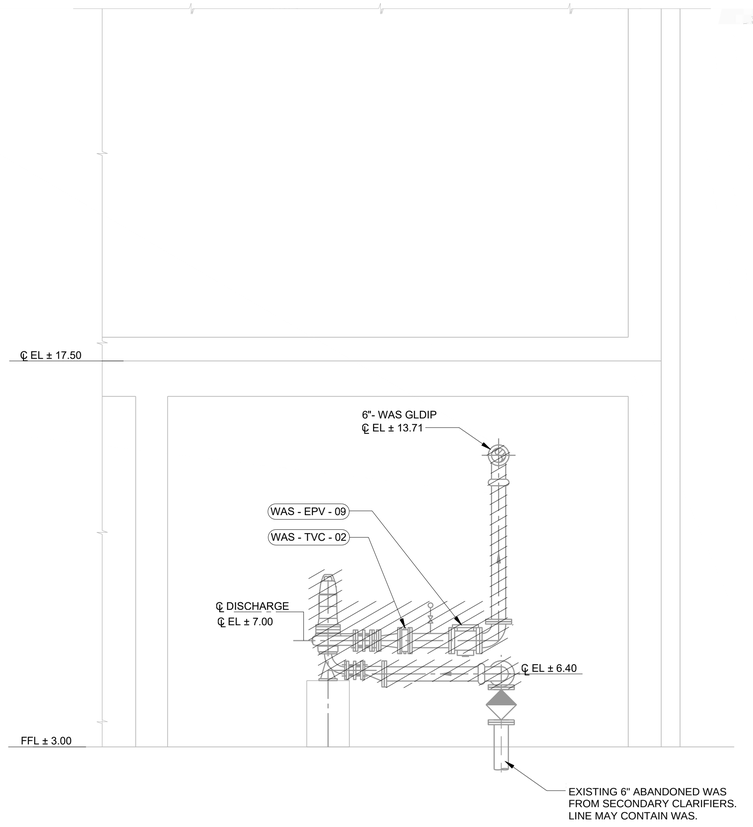
D409283



1 SECTION
D-10-101 3/8" = 1'-0"



2 SECTION
D-10-101 3/8" = 1'-0"

E PHOTO RAS PUMP
(TYPICAL)

F PHOTO WAS PUMP
(TYPICAL)

NOTES:

1. PLANS DO NOT NECESSARILY REPRESENT THE ACTUAL SYSTEM CONFIGURATION AND ALL ITEMS REQUIRING DEMOLITION, REMOVAL, OR PATCHING. ALL DEMOLITION, REMOVAL, CUTTING, PATCHING, AND OTHER WORK NECESSARY TO ACCOMMODATE NEW CONSTRUCTION SHALL BE INCLUDED IN THE CONTRACT AT NO ADDITIONAL COST TO OWNER.
2. CONTRACTOR TO FIELD CHECK EXISTING DIMENSIONS AND PIPING SYSTEM COMPONENTS INCLUDING PIPING, VALVES, SUPPORTS AND FITTINGS REQUIRED PRIOR TO DEMOLITION AND REPLACEMENT.
3. EXISTING PUMP BASES AND CONCRETE PEDESTALS TO REMAIN.
4. EXISTING METAL PIPE SUPPORTS TO BE REPLACED AT EXISTING LOCATIONS EXCEPT WHERE SUPPORT IS SUPPORTING OTHER STRUCTURES NOT INCLUDED IN THIS PROJECT.
5. EXISTING SEAL WATER AND CHLORINE PIPING SHALL BE DEMOLISHED AND CAPPED AT SOURCE HEADER PIPE.
6. ALL WORK ASSOCIATED WITH OTHER UTILITIES AND ELECTRICAL CONDUITS AND REQUIRED FOR THE DEMOLITION AND REPLACEMENT OF THE PIPING SYSTEM WILL BE PROVIDED BY CONTRACTOR AT NO ADDITIONAL COST TO OWNER. SUCH WORK MAY INCLUDE TEMPORARY SUPPORT, RELOCATION, DISCONNECT, BY-PASS SYSTEMS, ETC. AND IS NOT SHOWN ON THESE DRAWINGS OR SPECIFIED.

6"1'2" 1' 2' 3' 4' 5' 6' 7'
3/8"=1'-0"

100% SUBMITTAL

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D409283

NO.	DATE	BY	CHK'APP
	REVISIONS AND RECORD OF USE		
	ISSUED FOR 60% SUBMITTAL		
1	09/28/2021	AD	PG IB
2	10/10/2022	AD	PG IB
	95% SUBMITTAL		
	02/01/2023		
	100% SUBMITTAL		

Date:
Engineer of Record:
Florida License No.:

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Coral Springs, FL 33134
Certificate No. 8132

CITY OF KEY WEST
RICHARD A. HEYMAN
ENVIRONMENTAL PROTECTION FACILITY
RAS AND WAS PUMPS REPLACEMENT

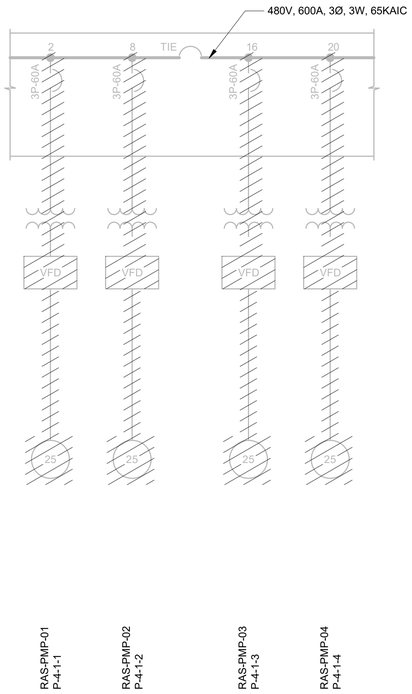
DEMOLITION
OPERATIONS BUILDING
SECTIONS

DESIGNED: MG
DETAILED: HT, AD
CHECKED: PG
APPROVED: IB
DATE: 02/01/2023

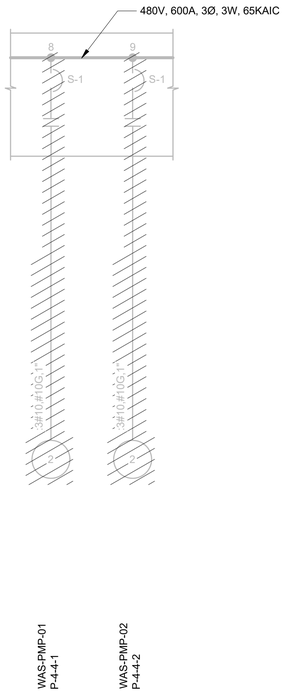
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
409283

D-10-301
SHEET
7 OF 28

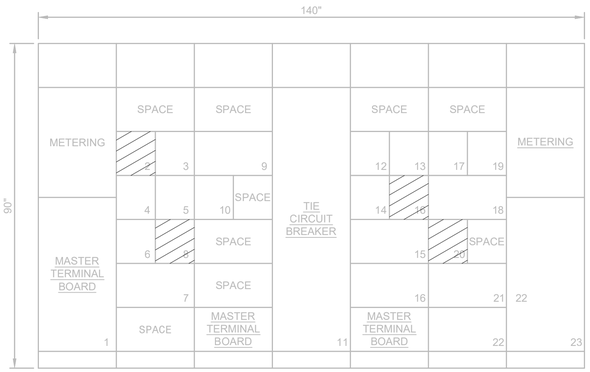


6MCC4A / 4B PARTIAL ONE-LINE DEMOLITION DIAGRAM
(ELECTRICAL ROOM)
NO SCALE

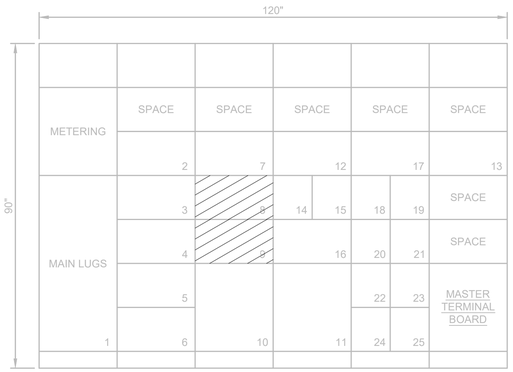


6MCC7 PARTIAL ONE-LINE DEMOLITION DIAGRAM
(ELECTRICAL ROOM)
NO SCALE

EXISTING VFD DEMOLITION
(PUMP ROOM)
NO SCALE



6MCC4A / 4B DEMOLITION FRONT ELEVATION
(ELECTRICAL ROOM)
NO SCALE



6MCC7 DEMOLITION FRONT ELEVATION
(ELECTRICAL ROOM)
NO SCALE

NOTES:

1. SEE DRAWINGS E-01 AND E-02 FOR ELECTRICAL LEGEND AND ABBREVIATIONS AND GENERAL REQUIREMENTS.
2. EXISTING VARIABLE FREQUENCY DRIVES ARE ALLEN-BRADLEY MODEL 1336 PLUS II.
3. CONTRACTOR SHALL SALVAGE EXISTING VFD ENCLOSURES AND EVALUATE IF THEY CAN BE USED TO HOUSE NEW VFDS. CONTRACTOR SHALL PROVIDE CREDIT TO ONWER IF EXISTING VFD ENCLOSURES CAN BE UTILIZED.

100% SUBMITTAL

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NO.	DATE	REVISIONS AND RECORD OF USE	BY	CHK/APP
	02/01/2023	100% SUBMITTAL		
	10/10/2022	95% SUBMITTAL		
1	11/26/2021	ISSUED FOR 65% SUBMITTAL	AD	PG IB

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Engineer of Record:
Florida License No.:

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Coral Springs, FL 33134
Certificate No. 8132

CITY OF KEY WEST
RICHARD A. HEYMAN
ENVIRONMENTAL PROTECTION FACILITY
RAS AND WAS PUMPS REPLACEMENT

DEMOLITION
ONE-LINE DEMOLITION DIAGRAMS

DESIGNED:	DG
DETAILED:	HT, AD
CHECKED:	RRB
APPROVED:	RRB
DATE:	02/01/2023

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
409283

D-10-302
SHEET
8 OF 28

GENERAL

1. THE APPLICABLE BUILDING CODE IS AS INDICATED IN THE BASIC LOADING CRITERIA LISTED ON THIS DRAWING.
2. THE REQUIREMENTS INDICATED ON THIS SHEET ARE INTENDED AS A BASIC SUMMARY OF THE MATERIAL AND CONSTRUCTION REQUIREMENTS FOR THE PROJECT. ADDITIONAL, MORE STRINGENT REQUIREMENTS ARE GIVEN IN THE PROJECT DETAIL DRAWINGS AND SPECIFICATIONS.
3. ALL STRUCTURAL RELATED SHOP DRAWINGS SHALL BE REVIEWED BY THE ENGINEER PRIOR TO CONSTRUCTION.
4. STRUCTURES MAY BE BUOYANT WHEN EMPTY DURING CONSTRUCTION. CONTRACTOR SHALL PROTECT STRUCTURES AGAINST FLOTATION UNTIL CONSTRUCTION IS COMPLETE. .
5. STRUCTURES MAY BE UNSTABLE UNTIL THEY ARE CONSTRUCTED IN THIER ENTIRETY. CONTRACTOR IS RESPONSIBLE FOR DESIGNING TEMPORARY STRUCTURAL SUPPORTS TO RESIST WIND LOADS, CONSTRUCTION LOADS, AND ANY OTHER TEMPORARY CONDITIONS THAT MAY OCCUR DURING CONSTRUCTION, IN ORDER TO MAINTAIN STABILITY OF THE CONSTRUCTION WORK. ANCHORS FOR CONTRACTOR'S TEMPORARY SUPPORT SYSTEMS THAT ATTACH TO CONCRETE OR MASONRY SHALL BE LOCATED TO AVOID DAMAGING EMBEDDED REINFORCEMENT OR UTILITIES.

CAST-IN-PLACE CONCRETE

1. A MINIMUM 28 DAY COMPRESSIVE STRENGTH (f'c) OF 4,000 PSI WAS UTILIZED IN THE DESIGN OF STRUCTURAL REINFORCED CONCRETE. SEE SPECIFICATIONS FOR CONSTRUCTION STRENGTH REQUIREMENTS.
2. THE LOCATION OF ALL CONSTRUCTION JOINTS AND OTHER TYPES OF JOINTS, OTHER THAN THOSE SPECIFIED OR SHOWN ON THE PLANS, SHALL BE ACCEPTABLE TO THE ENGINEER PRIOR TO PLACING CONCRETE.
3. PROVIDE 3/4" CHAMFER ON ALL EXPOSED CORNERS.

REINFORCING STEEL

1. ALL REINFORCING BAR SHALL BE GRADE 60, DEFORMED, ASTM A615, UNLESS NOTED OTHERWISE.
2. DIMENSIONS TO REINFORCING BARS ARE TO BAR CENTERLINES, UNLESS NOTED OTHERWISE. BAR COVER IS THE CLEAR DISTANCE BETWEEN THE BAR AND THE CONCRETE SURFACE.
3. NO WELDING OF REINFORCING BARS SHALL BE PERMITTED UNLESS APPROVAL IS OBTAINED FROM THE ENGINEER PRIOR TO CONSTRUCTION.
4. FOR CONCRETE SLABS THAT HAVE A SLOPING TOP FACE, THE TOP LAYERS OF REINFORCEMENT SHALL BE PLACED ON A SIMILAR SLOPE SO THAT SPECIFIED COVER IS MAINTAINED.

POST-INSTALLED ANCHORS

1. POST-INSTALLED ANCHORS SHALL INCLUDE ADHESIVE ANCHORS (THREADED RODS, BOLTS OR REINFORCING BARS), EXPANSION ANCHORS, AND UNDERCUT ANCHORS INSTALLED INTO HARDENED CONCRETE OR MASONRY. SEE THE ANCHORAGE IN CONCRETE AND MASONRY SPECIFICATION SECTION FOR ADDITIONAL REQUIREMENTS.
2. POST-INSTALLED ANCHORS SHALL ONLY BE USED WHERE INDICATED ON THE DRAWINGS. CONTRACTOR SHALL OBTAIN APPROVAL FROM ENGINEER PRIOR TO USING POST-INSTALLED ANCHORS FOR MISSING OR MISPLACED CAST-IN-PLACE ANCHORS.
3. CARE SHALL BE TAKEN TO AVOID CONFLICTS WITH EXISTING REINFORCING STEEL AND OTHER EMBEDDED ITEMS WHEN DRILLING HOLES. REINFORCING BARS SHALL NOT BE DAMAGED DURING DRILLING OR ANCHOR INSTALLATION. HOLES SHALL BE DRILLED AND CLEANED PER THE PRODUCT MANUFACTURER'S INSTRUCTIONS. ANCHORS SHALL BE INSTALLED PER THE PRODUCT MANUFACTURER'S INSTRUCTIONS AT NOT LESS THAN MINIMUM EDGE DISTANCES AND/OR SPACING INDICATED IN THE MANUFACTURER'S LITERATURE.
4. SUBSTITUTION REQUESTS FOR PRODUCTS OTHER THAN THOSE LISTED IN THE SPECIFICATION OR INDICATED ON THE DRAWINGS SHALL BE SUBMITTED TO ENGINEER FOR REVIEW AND APPROVAL. PRODUCT ICC-ESR EVALUATION REPORTS SHALL BE INCLUDED WITH THE SUBMITTAL PACKAGE. IF REQUESTED, CALCULATIONS PREPARED BY A REGISTERED PROFESSIONAL ENGINEER USING METHODS AND PROCEDURES REQUIRED BY THE BUILDING CODE MAY BE REQUIRED AS PART OF THE SUBMITTAL PACKAGE.
5. UNLESS NOTED OTHERWISE, THE MINIMUM EMBEDMENT PROVIDED FOR ADHESIVE ANCHORED REINFORCING BARS SHALL DEVELOP THE FULL TENSILE STRENGTH OF THE BAR.
6. SPECIAL INSPECTION WILL BE PROVIDED FOR ALL POST-INSTALLED ANCHORS.

STRUCTURAL STEEL

1. ROLLED WIDE FLANGE SHAPES SHALL HAVE A MINIMUM YIELD STRENGTH OF 50 KSI;
   CHANNELS, PLATES, AND ANGLES A MINIMUM OF 36 KSI;
   STRUCTURAL PIPES A MINIMUM OF 35 KSI;
   ROUND STRUCTURAL TUBES A MINIMUM OF 46 KSI;
   RECTANGULAR STRUCTURAL TUBES A MINIMUM OF 50 KSI.
2. WELDING SHALL BE DONE WITH A FILLER MATERIAL HAVING A MINIMUM TENSILE STRENGTH OF 70 KSI.
3. BOLTED CONNECTIONS SHALL USE 3/4" DIA ASTM F3125, GRADE A325 BOLTS OR GRADE F1852 TWIST-OFF BOLTS, WITH THE THREADS EXCLUDED FROM THE SHEAR PLANE, UNLESS NOTED OTHERWISE.
4. HOLES FOR ANCHOR RODS AND ANCHOR BOLTS IN COLUMN BASE PLATES USING ASTM F844 OR F436 FLAT CIRCULAR WASHERS SHALL BE AS FOLLOWS:

   BOLTS/RODS 3/4" TO 1" - 5/16" OVERSIZE
   BOLTS/RODS 1" TO 2" - 1/2" OVERSIZE
   BOLTS/RODS OVER 2" - 1" OVERSIZE

   AT THE CONTRACTORS OPTION, OVERSIZE HOLES LARGER THAN THOSE LISTED ABOVE MAY BE USED, PROVIDED THAT 3/8" PLATE WASHERS ARE USED WITH STANDARD HOLES AND FIELD WELDED WITH A 5/16" FILLET WELD TO THE BASE PLATE ALONG A MIN OF 3 SIDES.

EXISTING STRUCTURES

1. THE DRAWINGS DEPICT WORK AT EXISTING STRUCTURES. ALL DIMENSIONS AND ALL DEPICTIONS SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO ORDERING MATERIALS, STARTING FABRICATION, OR STARTING CONSTRUCTION.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE, REPAIRS OR STRUCTURAL MODIFICATIONS THAT ARE REQUIRED DUE TO DEMOLITION BEYOND THE LIMITS IDENTIFIED IN THE DRAWINGS.
3. REINFORCEMENT FOR ANY EXISTING CONCRETE OR MASONRY ELEMENT SHALL NOT BE DAMAGED UNLESS THE ELEMENT IS TO BE DEMOLISHED. WHEN LOCATING EXISTING REINFORCEMENT IS REQUIRED, IT SHALL BE LOCATED USING NON-DESTRUCTIVE METHODS. REINFORCING STRANDS IN EXISTING PRESTRESSED CONCRETE SHALL NOT BE CUT UNLESS INDICATED ON THE DRAWINGS OR OTHERWISE AUTHORIZED BY THE ENGINEER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE, REPAIRS OR STRUCTURAL MODIFICATIONS THAT ARE REQUIRED DUE TO DAMAGE OF CONCRETE, MASONRY OR REINFORCEMENT THAT HAS BEEN IDENTIFIED ON THE DRAWINGS TO REQUIRE FIELD VERIFICATION.
4. CORE DRILLING AND SAW CUTTING SHALL NOT BE PERFORMED UNLESS INDICATED ON THE DRAWINGS OR APPROVED BY ENGINEER.
5. EXPOSED CONCRETE SURFACES THAT REMAIN AFTER DEMOLITION SHALL BE REPAIRED TO MATCH ADJACENT CONCRETE SURFACES.
6. UNLESS OTHERWISE INDICATED ON THE DRAWINGS, EXPOSED CONCRETE SURFACES WITH REINFORCEMENT, ANCHOR BOLTS, HANGER RODS, OR OTHER EXPOSED METAL EMBEDMENTS SHALL BE REPAIRED BY CUTTING OFF THE METAL AT THE FACE OF THE CONCRETE, GRINDING SMOOTH, AND COATING. COATING SHALL EXTEND A MINIMUM OF 1" BEYOND THE EDGE OF ANY EXPOSED METAL.

DELEGATED DESIGN

1. THE FOLLOWING ITEMS ARE IDENTIFIED IN THE DRAWINGS AND SPECIFICATIONS AS BEING DESIGNED AND SEALED BY OTHERS. SUBMITTALS FOR THESE ITEMS SHALL BE PREPARED BY THE SUPPLIERS AND SUBMITTED TO ENGINEER AND CODE OFFICIAL FOR REVIEW.

   SECTION 15140 - PIPE SUPPORTS

PIPE SUPPORTS

1. PIPE SUPPORTS FOR PIPES 12 INCHES IN DIAMETER OR SMALLER SHALL BE PER SPECIFICATION SECTION 15140 FOR PIPES LARGER THAN 12 INCHES IN DIAMETER, THE NOTES AND DETAILS SHOWN ON THE DRAWINGS SHALL PRECEDE THE SPECIFICATIONS ALTHOUGH SPECIFICATION SECTION 15140 MAY USED FOR INFORMATION NOT FOUND ON THE DRAWINGS.
2. ALL NON-HANGER TYPE SUPPORTS SHALL HAVE A CONCRETE PAD INSTALLED AT EACH LEG BASE FOR PREFABRICATED CHANNELS/UNISTRUT SUPPORTS OR AT EACH STEEL COLUMN PIPE SUPPORT BASE. REFER TO DRAWING S-00-003 FOR TYPICAL PIPE SUPPORT BASE DETAIL.
3. THE CONTRACTOR SHALL REMOVE THE EXISTING HANGER RODS AND SADDLE AT THE EXISTING HANGER SUPPORTS AND REPLACE PER DETAILS AND NOTES ON DRAWING S-00-002. DURING REPLACEMENT OF THE HANGER RODS THE CONTRACTOR SHALL ALSO INSPECT THE EXISTING EMBEDDED CEILING HANGER BRACKETS. EXISTING BRACKETS FOUND TO BE IN SUFFICIENT SUITABLE CONDITION MAY BE REUSED. IF THE EXISTING BRACKET IS FOUND TO NOT BE IN SUFFICIENT CONDITION FOR REUSE NEW ANCHORS SHALL BE INSTALLED AS CLOSE TO THE EXISTING AS POSSIBLE ALONG WITH THE NEW HANGER RODS AND SADDLE. REFER THE DETAILS ON DRAWING S-00-002 AND ANCHOR MANUFACTURER LITERATURE FOR ANCHOR INSTALLATION REQUIREMENTS.

BASIC LOADING CRITERIA

THE APPLICABLE BUILDING CODE IS THE 2020 FLORIDA BUILDING CODE.

1. DEAD LOAD ..... AS CALCULATED
2. LIVE LOADS ..... AS CALCULATED
3. SNOW LOAD:
   GROUND SNOW LOAD (P_g) ..... 0 PSF
   SNOW EXPOSURE FACTOR (C_e) ..... N/A
4. SEISMIC LOAD:
   MAPPED MCE SHORT PERIOD SPECTRAL RESPONSE ACCELERATION (S_S) 0.021g
   MAPPED MCE ONE SECOND PERIOD SPECTRAL RESPONSE ACCELERATION (S_1) 0.013g
   DESIGN SPECTRAL RESPONSE ACCELERATION AT SHORT PERIODS (S_{DS}) 0.022g
   DESIGN SPECTRAL RESPONSE ACCELERATION AT ONE SECOND PERIOD (S_{D1}) 0.021g
   SITE CLASS ..... D
   RISK CATEGORY III
   SEISMIC DESIGN CATEGORY ..... A
5. WIND LOAD:
   BASIC (ULTIMATE) DESIGN WIND SPEED ..... 200 MPH
   ALLOWABLE STRESS (NOMINAL) DESIGN WIND SPEED ..... 150 MPH
   GROUND ELEVATION FACTOR (K_e) 1.0
   EXPOSURE ..... D
   RISK CATEGORY III

100% SUBMITTAL

NO.	BY	CHK	APP	DATE	REVISIONS AND RECORD OF USE
				02/01/2023	100% SUBMITTAL
2	AIP	DLD	IB	09/28/2022	90% SUBMITTAL
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Engineer of Record:
Florida License No.:

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Certificate No. 8132

CITY OF KEY WEST
RICHARD A. HEYMAN
ENVIRONMENTAL PROTECTION FACILITY
RAS AND WAS PUMPS REPLACEMENT

STRUCTURAL
STRUCTURAL NOTES

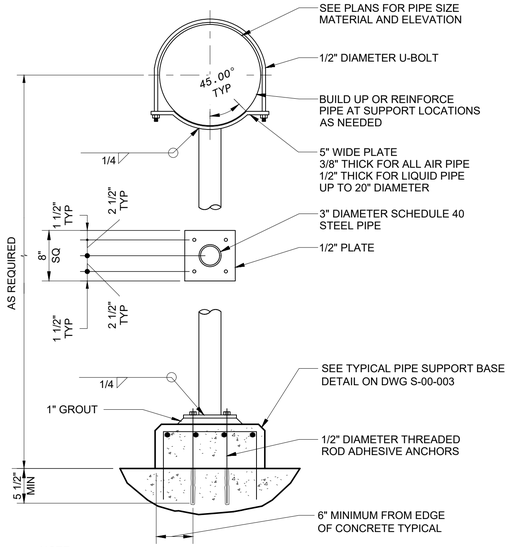
DESIGNED: MFS
DETAILED: AIP
CHECKED: DLD
APPROVED: IB
DATE: 02/01/2023

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
409283

S-00-001
SHEET
9 OF 28

FD9000
D409283

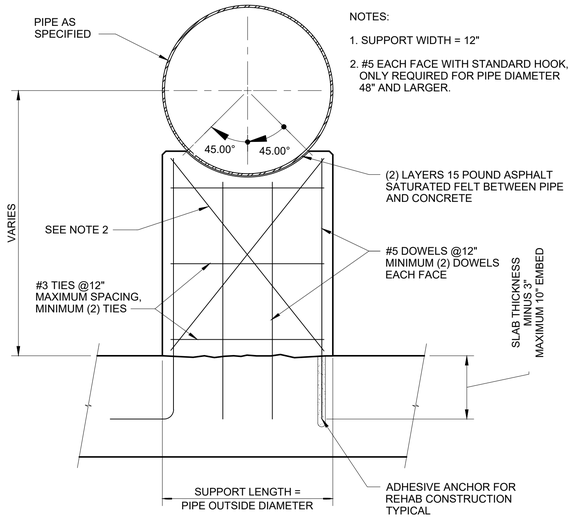


NOTE:

ALL STEEL MATERIALS SHALL BE HOT-DIP GALVANIZED FOR EXTERIOR LOCATIONS. VENT HOLES FOR GALVANIZING SHALL BE THE MINIMUM SIZE NECESSARY. HOLES SHALL BE LOCATED IN THE BOTTOM BASEPLATE AND ALSO LOCATED IN THE TOP OF THE PIPE, ADJACENT TO THE CURVED PLATE.

3 INCH DIAMETER STEEL COLUMN PIPE SUPPORT

1" = 1'-0"

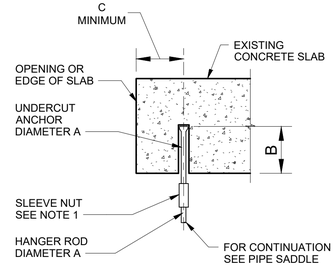


NOTES:

1. SUPPORT WIDTH = 12"
2. #5 EACH FACE WITH STANDARD HOOK, ONLY REQUIRED FOR PIPE DIAMETER 48" AND LARGER.

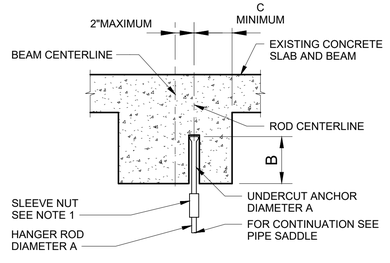
CONCRETE SADDLE PIPE SUPPORT

1" = 1'-0"



TYPE C - UNDERCUT ANCHOR IN SLAB

TYPE C SUPPORTS			
ID#	A	B	C
C-50	1/2"	5"	5"
C-75	3/4"	10"	9"



TYPE D - UNDERCUT ANCHOR IN BEAM

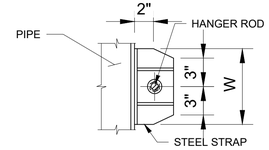
TYPE D SUPPORTS			
ID#	A	B	C
D-50	1/2"	5"	4"
D-75	3/4"	10"	8"

NOTES:

1. SLEEVE NUTS SHALL HAVE THE FOLLOWING MINIMUM ULTIMATE CAPACITIES:

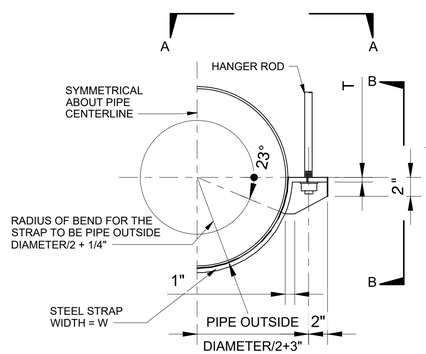
ROD DIAMETER	SLEEVE NUT CAPACITY
1/2"	7,100 LB
3/4"	15,900 LB
1"	28,300 LB

2. ALL PRODUCTS SHALL BE STAINLESS STEEL IN LOCATIONS WHERE EXPOSED WATER IS PRESENT. OTHERWISE ALL PRODUCTS SHALL BE GALVANIZED STEEL.
3. ALL MATERIALS ON THIS DRAWING SHALL BE AS SPECIFIED IN THE STRUCTURAL METALS SECTION AND THE ANCHORAGE IN CONCRETE AND MASONRY SECTION.



SECTION A-A

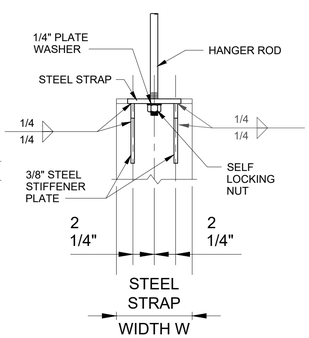
PIPE SADDLE	
PIPE SIZE	STRAP SIZE T x W
14"-16"	1/2"x6"
18"-20"	5/8"x6"
24"-30"	3/4"x6"
36"	3/4"x8"
42"-48"	3/4"x11"
54"	7/8"x11"
60"	7/8"x11"
66"	7/8"x11"



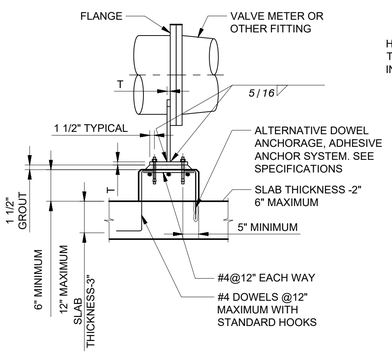
ELEVATION

PIPE SADDLE

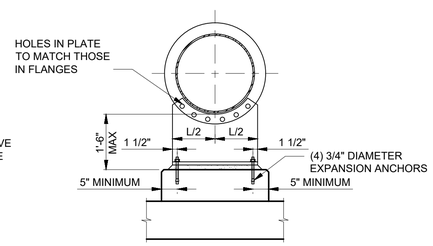
1 1/2" = 1'-0"



SECTION B-B



ELEVATION



SECTION

PIPE SIZE	T	L
14"-18"	5/8"	PIPE OD
20"	3/4"	18"
24"	3/4"	21"
30"	3/4"	27"
36"	3/4"	33"
42"	3/4"	36"
48"	3/4"	42"
54"	3/4"	44"
60"	3/4"	50"

NOTES:
OD = OUTSIDE DIAMETER

FLANGE PIPE SUPPORT

1/2" = 1'-0"

100% SUBMITTAL

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CITY OF KEY WEST
RICHARD A. HEYMAN
ENVIRONMENTAL PROTECTION FACILITY
RAS AND WAS PUMPS REPLACEMENT

STRUCTURAL
MISCELLANEOUS STRUCTURAL DETAILS

DESIGNED:	MFS
DETAILED:	AIP
CHECKED:	DLD
APPROVED:	IB
DATE:	02/01/2023

0 1/2 1

IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
409283

S-00-002
SHEET
10 OF 28

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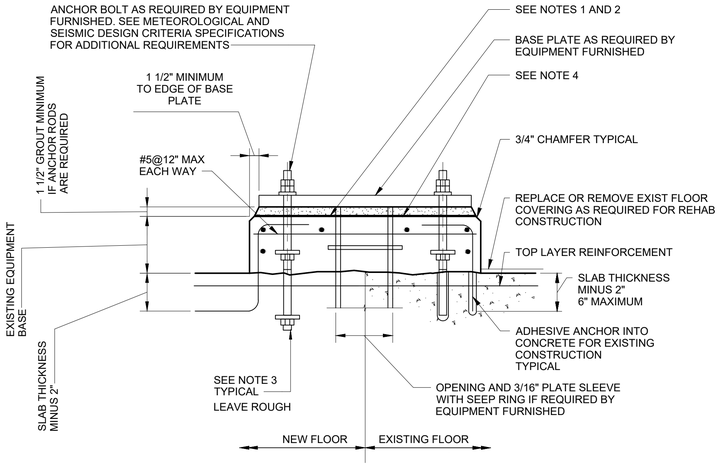
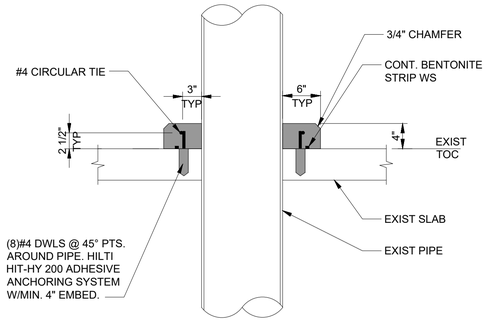


NOTES:

1. EQUIPMENT MANUFACTURER TO INDICATE REQUIRED FLATNESS WHERE NO GROUT IS SPECIFIED. TOLERANCES SHALL BE IN CONFORMANCE WITH ACI PRC-117 GUIDE FOR TOLERANCE COMPATIBILITY IN CONCRETE CONSTRUCTION.
2. CONTRACTOR AND SUPPLIER SHALL COORDINATE FINAL LOCATION AND SIZE OF PADS WITH EQUIPMENT FURNISHED. COORDINATE ANCHOR BOLT REQUIREMENTS FOR REQUIRED EMBEDMENT DEPTHS AND CONCRETE EDGE DISTANCES.
3. WHERE THE DESIGN ANCHOR BOLT EMBEDMENT IS GREATER THAN THE CONCRETE EQUIPMENT BASE THICKNESS, THEN THE REQUIRED DEPTH OF EMBEDMENT SHALL BE MEASURED FROM THE TOP OF STRUCTURAL SLAB AND NOT THE TOP OF THE EQUIPMENT BASE.
4. EQUIPMENT BASE SHALL USE STRUCTURAL CONCRETE AS INDICATED IN THE CAST-IN-PLACE CONCRETE SPECIFICATION. 5. ANCHOR BOLTS AND REINFORCING WILL BE INSPECTED IN ACCORDANCE WITH THE CODE REQUIRED SPECIAL INSPECTIONS AND PROCEDURES SPECIFICATION.

EQUIPMENT ANCHORAGE DETAIL

1" = 1'-0"

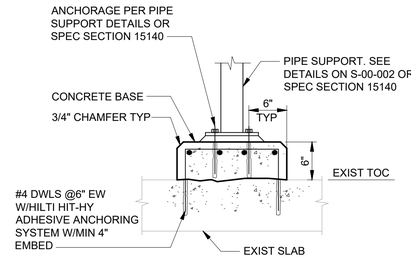


NOTE:

1. EXISTING PIPE SHALL BE RECOATED PRIOR TO INSTALLATION OF CONCRETE COLLAR. SURFACE PREP SHALL CONSIST OF ABRASIVE BLAST CLEANING TO NAPF 500-03-04 AND COATING SHALL BE COATING SYSTEM DATA SHEET 13S2 AS SPECIFIED IN SECTION 09940.

TYPICAL EXISTING PIPE PENETRATION COLLAR DETAIL

1" = 1'-0"



TYPICAL PIPE SUPPORT BASE DETAIL

1" = 1'-0"

100% SUBMITTAL

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RAS AND WAS PUMPS REPLACEMENT

STRUCTURAL
MISCELLANEOUS STRUCTURAL DETAILS

DESIGNED: MFS
DETAILED: AIP
CHECKED: DLD
APPROVED: IB
DATE: 02/01/2023

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S-00-003
SHEET
11 OF 28

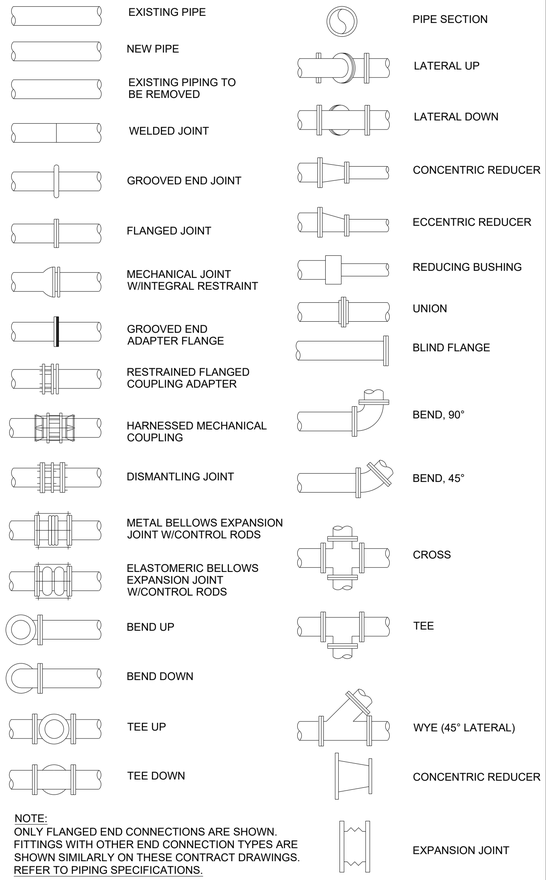
FB9000
D409283

PIPE, EQUIPMENT & VALVE TAG LEGEND

NOTE:
REFER TO PIPING SPECIFICATIONS AND P&ID'S.

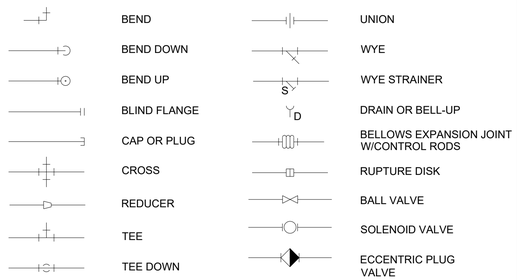
PIPE & FITTINGS SYMBOL LEGEND

DOUBLE LINE

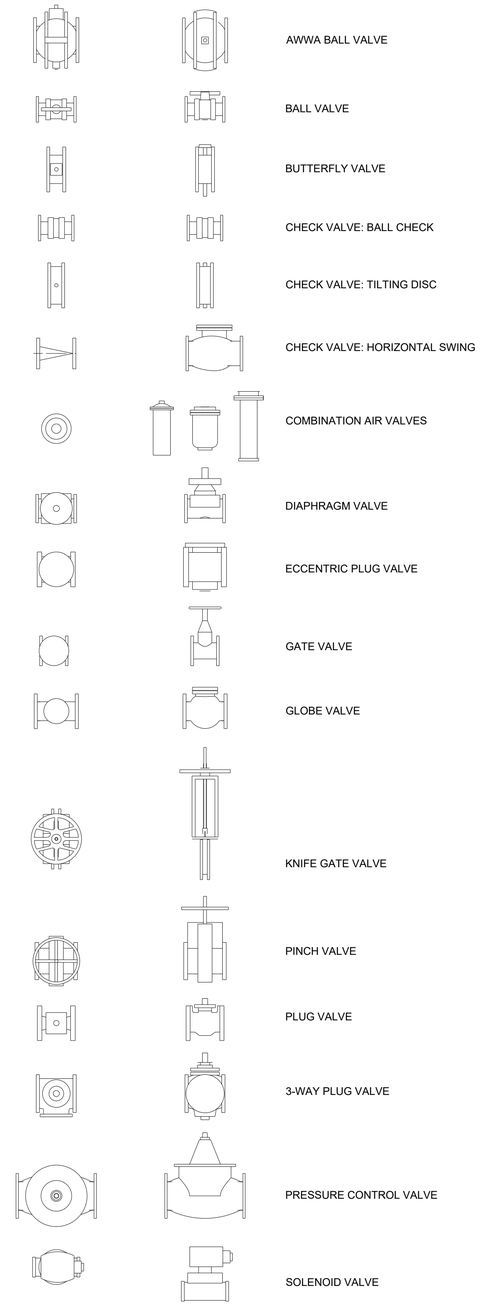


NOTE:
ONLY FLANGED END CONNECTIONS ARE SHOWN.
FITTINGS WITH OTHER END CONNECTION TYPES ARE SHOWN SIMILARLY ON THESE CONTRACT DRAWINGS.
REFER TO PIPING SPECIFICATIONS.

SINGLE LINE



VALVE SYMBOL LEGEND



NOTE:
VALVES SHOWN ARE REPRESENTATIVE ONLY. SEE SPECIFICATIONS FOR APPROVED MANUFACTURE LIST.

GENERAL PROCESS MECHANCAL NOTES

1. LEGENDS SHOWN IN THIS DRAWING ARE BASED ON A TEMPLATE THAT IS NOT PROJECT SPECIFIC. SOME LEGEND SYMBOLS ARE NOT USED ON THIS PROJECT, BUT ARE SHOWN TO PROVIDE A DICTIONARY FOR SYMBOLS THAT MAY ALSO BE USED DURING THE PROJECT CONSTRUCTION PHASE.
2. LAY PIPE TO UNIFORM GRADE BETWEEN INDICATED ELEVATION POINTS.
3. SIZE OF FITTINGS SHOWN ON DRAWINGS SHALL CORRESPOND TO ADJACENT STRAIGHT RUN OF PIPE, UNLESS OTHERWISE INDICATED. TYPE OF JOINT AND FITTING MATERIAL SHALL BE THE SAME AS SHOWN FOR ADJACENT STRAIGHT RUN OF PIPE.
4. ALL REQUIRED HANGERS, SUPPORTS, BRACES, INSERTS, AND ACCESSORIES ARE NOT SHOWN ON THE DRAWINGS. PIPE SUPPORTS FOR 12-INCH DIAMETER AND SMALLER PIPES SHALL BE DESIGNED AND FURNISHED BY THE CONTRACTOR IN ACCORDANCE WITH THE SPECIFICATIONS AND UTILIZING CONTRACTOR SELECTED SUPPORTS FROM THE SUPPORT DETAILS, OR THE SPECIFIC DETAIL CALLED FOR BY THE DRAWINGS.
5. ALL JOINTS SHALL BE WATERTIGHT
6. ALL BURIED PIPING SPECIFIED TO BE PRESSURE TESTED, EXCEPT FLANGED, WELDED, OR SCREWED PIPING, SHALL BE PROVIDED WITH THRUST PROTECTION AS SPECIFIED, UNLESS OTHERWISE NOTED.
7. NUMBER AND LOCATION OF UNIONS AND COUPLINGS SHOWN ON DRAWINGS IS ONLY APPROXIMATE. CONTRACTOR SHALL PROVIDE ALL UNIONS AND COUPLINGS REQUIRED BY THE SPECIFICATIONS AND AS NECESSARY TO FACILITATE CONVENIENT REMOVAL OF VALVES AND MECHANICAL EQUIPMENT.
8. WHERE A GROOVED END JOINT IS SHOWN,IT SHALL BE THE RIGID JOINT TYPE,UNLESS OTHERWISE SPECIFIED. WHERE A FLANGED COUPLING ADAPTER IS SHOWN, A STANDARD FLANGE SHALL BE JOINED TO THE COUPLING ADAPTER.
9. CONTRACTOR SHALL ORIENT VALVES AS SPECIFIED SHOWN ON DRAWINGS AND IN ACCORDANCE WITH VALVE SPECIFICATIONS.

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RAS AND WAS PUMPS REPLACEMENT

MECHANICAL
LEGENDS AND NOTES

DESIGNED:	MG
DETAILED:	HT, AD
CHECKED:	PG
APPROVED:	IB
DATE:	02/01/2023

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12 OF 27

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PROCESS MECHANICAL ABBREVIATIONS

GENERAL ABBREVIATIONS

A	
ABV	ABOVE
ACC	AREA CONTROL CENTER
ACP	ASBESTOS CEMENT PIPE
AD	ACCESS DOOR
ADWF	AVERAGE DRY-WEATHER FLOW
AFC	ABOVE FINISHED CONCRETE
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AL	ALUMINUM
ALT	ALTERNATE
AN	ANAEROBIC
APPROX	APPROXIMATE, APPROXIMATELY
ASSY	ASSEMBLY
AUTO	AUTOMATIC
AUX	AUXILIARY
AVG	AVERAGE
AX	ANOXIC
B	
BET	BETWEEN
BF	BLIND FLANGE
BFP	BELT FILTER PRESS
BFF	BELOW FINISH FLOOR
BL	BOTTOM LEVEL
BLDG	BUILDING
BLW	BELOW
BNR	BIOLOGICAL NUTRIENT REMOVAL
BOD	BOTTOM OF DUCT ELEVATION, BIOCHEMICAL OXYGEN DEMAND
BOF	BOTTOM OF FOOTING
BOT	BOTTOM
C	
C-C	CENTER TO CENTER
C/C	CENTER TO CENTER
C/L	CENTERLINE
CAP	CAPACITY
CB	CATCH BASIN
CCP	CONCRETE CYLINDER PIPE
CCSP	CONCRETE LINED AND COATED STEEL PIPE
CCT	CHLORINE CONTACT TANKS
CF	CUBIC FEET
CI	CAST IRON
CIP	CAST IRON PIPE
CIRC	CIRCUMFERENCE
CL2	CHLORINE
CLR	CHLORINATOR
CMC	CEMENT MORTAR COATED
CML	CEMENT MORTAR LINED
CMP	CORRUGATED METAL PIPE
CNTL	CONTROL
CO	CLEAN OUT
CO2	CARBON DIOXIDE
COD	CHEMICAL OXYGEN DEMAND
CONT	CONTINUED, CONTINUOUS
CP	COMPRESSOR
CPLG	COUPLING
CPVC	CHLORINATED POLYVINYL CHLORIDE
CRN	CRANE
CSP	CORRUGATED STEEL PIPE
CTF	CENTRIFUGE
CTR	CENTER
CTS	CORROSION/CATHODIC TEST STATION
CU	CUBIC
CY	CUBIC YARD
D	
D	DRAIN
DET	DETAIL
DI	DUCTILE IRON
DIA	DIAMETER
DIAG	DIAGRAM
DIFF	DIFFERENTIAL
DMJ	DISMANTLING JOINT
DN	DOWN
DO	DISSOLVED OXYGEN
DWG	DRAWING
E	
E	EAST, EASTING
EA	EACH
ECC	ECCENTRIC
EE	EACH END
EFF	EFFLUENT, EFFICIENCY
EJ	EXPANSION JOINT
EL	ELEVATION
ELEC	ELECTRICAL
ELL	ELBOW
EO	ELECTRICALLY OPERATED
EPWWF	EQUALIZED PEAK WET WEATHER FLOW
EQ	EQUAL
EQUIP	EQUIPMENT
EXIST	EXISTING
F	
FAB	FABRICATE(D)(TION)
FL	FLOW LINE
FLEX	FLEXIBLE
FLG	FLANGE(D)
FM	FORCE MAIN
FPC	FLEXIBLE PIPE COUPLING
FR	FLOW RATE
FRP	FIBERGLASS REINFORCED PIPE
FSL	FACULTATIVE SLUDGE LAGOON
FT	FOOT, FEET
FUT	FUTURE
G	
GA	GAGE, GAUGE
GALV	GALVANIZED
GEN	GENERAL, GENERATOR
GPD	GALLONS PER DAY
GPM	GALLONS PER MINUTE
GR	GRADE
H	
HDPE	HIGH DENSITY POLYETHYLENE
HDR	HEADER
HOR	HORIZONTAL
HP	HIGH POINT, HIGH PRESSURE
HR	HEAT RESERVOIR
HT	HEIGHT
HWTR	HIGH WATER
I	
ID	INSIDE DIAMETER
IE	INVERT ELEVATION
IJS	INFLUENT JUNCTION STRUCTURE
IN	INCH(ES)
INF	INFLUENT
INS	INSULATE(D)(ION)
INV	INVERT
IW	INJECTION WELL
IWI	INJECTION WELL INFLUENT
IWL	INJECTION WELL LOOP
L	
L	LENGTH
LB	POUND
LDLD	LINED DEDICATED LAND DISPOSAL
LEV	LEVEL
LF	LINEAR FEET
LG	LONG
LP	LOW POINT, LOW PRESSURE
LT	LEFT
LWR	LOWER
M	
MAN	MANUAL(LY)
MAX	MAXIMUM
MECH	MECHANICAL
MFR	MANUFACTURE(R)
MGD	MILLION GALLONS PER DAY
MH	MANHOLE
MI	MALLEABLE IRON
MIN	MINIMUM, MINUTE
MISC	MISCELLANEOUS
MJ	MECHANICAL JOINT
ML	MILLILITER
MW	MONITORING WELL
MO	MOTORIZED
N	
N	NORTH, NORTHING
N/A	NOT APPLICABLE
NAOH	SODIUM HYDROXIDE
NIC	NOT IN CONTRACT
NO./#	NUMBER
NOX	NITRATES AND NITRITES
NPSH	NET POSITIVE SUCTION HEAD
NPSHR	NET POSITIVE SUCTION HEAD REQUIRED
NRS	NON-RISING STEM
NTS	NOT TO SCALE
O	
OD	OUTSIDE DIAMETER
OPNG	OPENING
OPP	OPPOSITE
ORP	OXIDATION REDUCTION POTENTIAL
P	
P	PROCESS, PNEUMATIC
P&ID	PIPING/PROCESS AND INSTRUMENTATION DIAGRAM
PC	PIPE COUPLING
PCP	PLAIN CONCRETE PIPE
PE	PLAIN END
PEPS	PRIMARY EFFLUENT PUMPING STATION
PERC	PERCOLATION
PF	PRESSURIZED FLOW
PL	PROPERTY LINE, PIPELINE
PMO	PROJECT MANAGEMENT OFFICE
POP	PNEUMATIC OPERATOR
PPM	PARTS PER MILLION
PRES	PRESSURE
PROP	PROPELLER
PSI	POUNDS PER SQUARE INCH
PSL	PIPE SLEEVE
R	
R	RADIUS
RCP	REINFORCED CONCRETE PIPE
RCCP	REINFORCED CONCRETE CYLINDER PIPE
RED	REDUCE(R)
REG	REGULATOR
REQD	REQUIRED
RH	RIGHT HAND
RL	REDUCED LEVEL
RT	RIGHT
S	
S	SOUTH, SILENCER, SLOPE
SCH	SCHEDULE
SECT	SECTION
SHT	SHEET
SIM	SIMILAR
SL	SLOPE
SO2	SULFER DIOXIDE
SPEC(S)	SPECIFICATION(S)
SPG	SPACING
SQ	SQUARE
STD	STANDARD
SST	STAINLESS STEEL
ST	STEEL
T	
TBD	TO BE DETERMINED
TD	TANK DRAIN
TDS	TOTAL DISSOLVED SOLIDS
THD	THREADED
TO	TOP OF
TOG	TOP OF GRADE
TYP	TYPICAL
U	
UG	UNDERGROUND
UN	UNION
UON	UNLESS OTHERWISE NOTED
V	
VAR	VARIES, VARIABLE
VCP	VITRIFIED CLAY PIPE
VERT	VERTICAL
W	
W	WEST, WIDTH
W/	WITH
W/O	WITHOUT
WF	WIDE FLANGE
WM	WALL MOUNTED
WS	WATER SURFACE
WSL	WATER SURFACE LEVEL
WSTP	WATERSTOP
WT	WATERTIGHT, WEIGHT
Y	
YCO	YARD CLEANOUT
MISC	
Ø	ROUND, DIAMETER

PIPING SYSTEM ABBREVIATIONS

A	
A	AERATION AIR
AA	AGITATION AIR
ACH	AFTER COOLER WATER
ASH	ASH PNEUMATIC
B	
BD	BOILER BLOWDOWN
BF	BOILER FEEDWATER
BSC	BIOLOGICAL SCUM
C	
CA	COMPRESSED AIR
CAA	CHANNEL AERATION AIR
CC	CENTRIFUGE CAKE
CD	CHEMICAL DRAIN
CEN	CENTRATE
CF	CENTRIFUGE FEED
CFA	CONDENSATE FOUL AIR
CFE	CHLORINATED FINAL EFFLUENT
CL	LOW PRESSURE CONDENSATE
CLG	CHLORINE GAS
CLL	CHLORINE LIQUID
CLS	CHLORINE SOLUTION
CLV	CHLORINE VACUUM
CM	MEDIUM PRESSURE CONDENSATE
CPA	CHEMICAL PADDING AIR
CS	CIRCULATING SLUDGE
CSO	CAUSTIC SODA
CV	CHEMICAL VENT
D	
DR	DRAIN
DFE	DECHLORINATED FINAL EFFLUENT
DIZ	DEIONIZED WATER
DS	DIGESTED SLUDGE
DSSG	DIGESTED SLUDGE/SLUDGE GAS
DRS	DRAIN, SANITARY
E	
EA	EMISSION AIR
ED	EQUIPMENT DRAIN
EWS	ESB WASHDOWN SYSTEM
EV	EMERGENCY VENT
EXH	EXHAUST
F	
FAE	FOUL AIR EXHAUST
FBW	FILTER BACKWASH WATER
FC	FERRIC CHLORIDE
FCA	FLANGEL COUPLING ADAPTER
FE	FILTER EFFLUENT
FILT	FILTRATE
FMSC	FOAM SUPRESSING CHEMICAL
FOG	FATS, OILS, AND GREASE
FO	FUEL OIL
FOF	FUEL OIL FILL
FOM	FUEL OIL MAINTENANCE
FOR	FUEL OIL RETURN
FOS	FUEL OIL SUPPLY
FOT	FUEL OIL TRANSFER
FI	FILTER INFLUENT
FR	FILTER RECIRCULATION
G	
GC	GAS CIRCULATION
GLY	GLYCOL/WATER COOLANT
GR	GRIT
GRC	GAS RECIRCULATION COMPRESSOR
GRO	GRIT OVERFLOW
H	
HCL	HYDROCHLORIC ACID
HLD	HIGH LEVEL DISINFECTION
HNG	HIGH PRESSURE NATURAL GAS
HOH	HIGH PRESSURE HYDRAULIC OIL
HOL	LOW PRESSURE HYDRAULIC OIL
HRR	HEAT RESERVOIR RETURN
HRS	HEAT RESERVOIR SUPPLY
HS	HARVESTED SLUDGE
HSO	SULFURIC ACID
HTV	HIGH TEMPERATURE VENT
I	
IA	INSTRUMENT AIR
J	
JCW	JACKET COOLING WATER
L	
LOD	LUBE OIL DRAIN
M	
MG	MIXED GAS
ML	MIXED LIQUOR
MLF	MIXED LIQUOR FERMENTER
MLR	MIXED LIQUOR RECYCLE
MS	MIXED SLUDGE
MSCS	MIXED SLUDGE/CIRCULATING SLUDGE
MSDS	MIXED SLUDGE/DIGESTER SLUDGE
MSG	MEDIUM PRESSURE SLUDGE GAS
O	
OCA	ODOR CONTROL AIR
ODG	OXYGEN DRY GAS
OF	OVERFLOW
OFSG	OVERFLOW/SLUDGE GAS
OHP	OXYGEN HIGH PRESSURE
OLPD	OXYGEN LOW PRESSURE DISCHARGE
OLPS	OXYGEN LOW PRESSURE SUCTION
P	
PA	PRE-AERATION AIR
PAS	PRIMARY AND ACTIVATED SLUDGE
PCH	HIGH PRESSURE PROCESS CONDENSATE
PCL	LOW PRESSURE PROCESS CONDENSATE
PCR	PROCESS CONDENSATE RETURN
PD	PUMPED DRAINAGE
PE	PRIMARY EFFLUENT
PEJ	PRIMARY EFFLUENT JETTING
PERM	PERMEATE
PF	PRESSURIZED FLOW
POL	POLYELECTROLYTE
PRS	PROCESS SAMPLING
PS	PRIMARY SLUDGE
PSC	PRIMARY SCUM
PSCS	PRIMARY SLUDGE/CIRCULATING SLUDGE
PSG	PRIMARY SLUDGE AND GRIT
PSO	POLYMER SOLUTION
PSR	PRIMARY SLUDGE RECIRCULATION
PSS	PROCESS STEAM SUPPLY
R	
RAS	RETURN ACTIVATED SLUDGE
RG	REFRIGERANT GAS
RL	REFRIGERANT LIQUID
RS	RAW SEWAGE
RWL	RAIN WATER LEADER
RWP	RAIN WATER PIPE
S	
S	STEAM
IE	STARTER AIR
SBIS	SODIUM BISULFITE
SC	SCUM DECANT
SCL	SODIUM HYPOCHLORITE SOLUTION
SHC	SODIUM HYPOCHLORITE CONTAINMENT
SCR	STEAM CLEAN RINSE
SCS	STEAM CLEAN SUPPLY
SD	SANITARY DRAIN
SE	SECONDARY EFFLUENT
SG	SLUDGE GAS
SHS	SODIUM HYDROXIDE SOLUTION
SME	SAMPLE-EFFLUENT
SMI	SAMPLE-INFLUENT
SMML	SAMPLE MIXED LIQUOR
SMO	SAMPLE OXYGEN
SMP	SAMPLE-PRIMARY EFFLUENT
SMS	SLUDGE SAMPLE-SLUDGE
SN	SUPERNATANT
SOG	SULFER DIOXIDE GAS
SOL	SULFER DIOXIDE LIQUID
SOS	SULFER DIOXIDE SOLUTION
SOV	SULFER DIOXIDE VACUUM
SPC	SUPPLEMENTAL CARBON
SPD	SUMP PUMP DISCHARGE
SR	SCREENINGS
SRA	SCUM REMOVAL AIR
SRF	SCREENINGS FEED
SRO	SCREENINGS OVERFLOW
SSC	SECONDARY SCUM
SSE	SIDESTREAM EFFLUENT
STD	STORM DRAIN
SWAS	SAMPLE-WASTE ACTIVATED SLUDGE
SW	SOLIDS WASTE
T	
TA	TOOL AIR
TD	TANK DRAIN
TE	THICKENING EFFLUENT
THS	THICKENING SIDESTREAM
TO	THICKENED OVERFLOW
TS	TRANSFER SLUDGE
TSC	THICKENED SCUM
TWAS	THICKENED WASTE ACTIVATED SLUDGE
U	
UA	UTILITY AIR
UD	UNDER DRAIN
V	
V	VENT
VA	VACUUM
VS	STEAM VENT
W	
W1	TBD
W3	TBD
WAS	WASTE ACTIVATED SLUDGE
WFP	WATER FIRE PROTECTION
WFSW	FILTERED SURFACE WASH WATER
WHWC	WASTE HEAT COOLING WATER RETURN-COGEN
WHWR	WASTE HEAT COOLING WATER RETURN
WHWS	WASTE HEAT COOLING WATER SUPPLY
WI	WETLANDS INFLUENT
WIJ	WELL, INJECTION
WML	WASTE MIXED LIQUOR
WNP	NON-POTABLE WATER
WNM	NON-POTABLE WATER, MONITORING
WNS	NON-POTABLE WATER SOFT
WP	POTABLE WATER
WPS	POTABLE WATER SOFT
WR	RECLAIMED WATER
WRF	RECLAMATION WATER, FILTERED
WRH	RECLAIMED WATER HIGH PRESSURE
WRL	RECLAIMED WATER LOW PRESSURE
WRS	FOAM SUPPRESSING SPRAY WATER
WS	SERVICE WATER
WIJ	WELL, INJECTION

EQUIPMENT ABBREVIATIONS

A	
AA	ATOMIC ABSORPTION UNIT
ACC	AREA CONTROL CENTER
AE	ANALYZER ELEMENT
AHF	ACTIVE HARMONIC FILTER
AMD	AIR MONITORING DEVICE
ARV	AIR RELEASE VALVE
AV	ANGLE VALVE
B	
B	BLOWER
BFP	BACKFLOW PREVENTER, BELT FILTER PRESS
BKHD	BULKHEAD
BKR	BREAKER
BSN	BAR SCREEN
C	
C	CRANE
CAV	COMBINATION AIR VALVE
CFR	CHEMICAL FEEDER
COM	COMMINUTOR
COB	CONVEYOR BELT
CP	COMPRESSOR
CPNL	CONTROL PANEL
CSN	COMMINUTING SCREEN
CENT	CENTRIFUGE
CTS	CATHODIC PROTECTION TEST STATION
CYL	CYLINDER
E	
EPV	ECCENTRIC PLUG VALVE
D	
DE	DENSITY METER
DF	DISK FILTER
DPR	DAMPER
DU	DRIVE UNIT
F	
FDK	FILTER, DISK
FE	FILTER EFFLUENT
FG	FLAP GATE
FI	FILTER INFLUENT
FLC	FLOCCULATOR
FLP	FLUID POWER UNIT
FLT	FILTRATE
FM	FLOW METER
FMX	FLASH MIXER
FN	FAN
FP	FILTER PRESS
G	
GBV	GLOBE VALVE
GDR	GRINDER
GEN	GENERATOR
GV	GATE VALVE
H	
H	HOIST
HEX	HEAT EXCHANGER
I	
ICN	INCINERATOR
IR	INLET RELIEF
K	
KGV	KNIFE GATE VALVE
M	
MC	MAGNETIC CLUTCH
MD	MOTORIZED DAMPER
MBR	MEMBRANE BIO REACTOR
MME	MISCELLANEOUS MECHANICAL EQUIPMENT
MW	MONITORING WELL
MV	MUD VALVE
MVU	MOBILE VENTILATION UNIT
MX	MIXER
N	
NOCL	SODIUM HYPOCHLORITE
NT	NEUTRALIZATION TANK
O	
OCU	ODOR CONTROL UNIT
ORF	ORFICE (PIPING), ODOR REMOVAL FILTER
ORP	OXIDATION REDUCTION POTENTIAL
ORU	ODOR REDUCTION UNIT
P	
PMP	PUMP
PCHV	PINCH VALVE
PDIT	PRESSURE DIFFERENTIAL INDICATOR TRANSMITTER
PG	PRESSURE GAUGE
PMH	PROCESS MANHOLE
POP	PNEUMATIC OPERATOR
PRS	PRESSURE REDUCING STATION
PRV	PRESSURE REGULATING (REDUCING) VALVE, PRESSURE RELIEF VALVE
PSV	POP SAFETY VALVE
PVL	PRESSURE VESSEL
S	
S	SILENCER
SBR	SCRUBBER
SCRN	SCREEN
SEP	SEPARATOR
SG	SLUICE GATE
SI	SPEED INDICATOR
SLG	SLIDE GATE
SMX	SLURRY MIXER
SRV	SAFETY RELIEF VALVE
STN	STRAINER
SV	SOLENOID VALVE
T	
TNK	TANK
TBN	TURBINE
TVC	TILTING DISK CHECK VALVE
V	
VB	VALVE BOX
VBF	BUTTERFLY VALVE
VBM	BALL VALVE
VC	CHECK VALVE
VFT	VACUUM FILTER
VP	VACUUM PUMP
VRV	VACUUM RELEASE VALVE
VS	VACUUM SYSTEM
VSC	VARIABLE SPEED COUPLING (ECC)
W	
W	WEIR
WG	WEIR GATE
WM	WATER MAIN
WRP	WEIR, ROTATING PIPE

INTERIOR PIPING ABBREVIATIONS

ALP	AIR LOW PRESSURE
CMS	COMPRESSED AIR
FSC	FERMENTER SCUM
G	NATURAL GAS
PD	SUMP PUMP DISCHARGE
PS	PRIMARY SLUDGE
RAS	RETURN ACTIVATED SLUDGE
RCS	RECIRCULATED SLUDGE
SAN	SANITARY
TFS	THICKENED FERMENTED SLUDGE
V	VENT
WAS	WASTE ACTIVATED SLUDGE
W2	NON-POTABLE WATER

PIPE MATERIAL ABBREVIATIONS

D	
DIP	DUCTILE IRON PIPE
P	
PCCP	PRESTRESSED CONCRETE CYLINDER PIPE
PVC	POLYVINYL CHLORIDE

NOTES:

1. FOR EQUIPMENT ABBREVIATIONS, INCLUDING FOR VALVES, REFER TO P&ID LEGEND AND ABBREVIATIONS DRAWINGS FUNCTION CODE ABBREVIATIONS.
2. FOR SYSTEM AND PROCESS STREAM ABBREVIATIONS, REFER TO P&ID LEGEND AND ABBREVIATIONS DRAWINGS SYSTEM CODE AND PROCESS CODE ABBREVIATIONS.
3. FOR PIPE MATERIAL AND INSULATION MATERIAL ABBREVIATIONS REFER TO P&ID LEGEND AND ABBREVIATIONS DRAWINGS PIPELINE MATERIAL CODE AND INSULATION MATERIAL CODE ABBREVIATIONS.

100% SUBMITTAL

NO.	BY	CHK	APP	DATE	REVISIONS AND RECORD OF USE
2	AD	PG	IB	02/01/2023	100% SUBMITTAL
1	AD	PG	IB	10/10/2022	95% SUBMITTAL
				09/28/2021	ISSUED FOR 60% SUBMITTAL

Date:
Engineer of Record:
Florida License No.:

BLACK & VEATCH
Black & Veatch Corporation
2121 Ponce de Leon Boulevard, Suite 305
Coral Springs, FL 33134
Certificate No. 8132

CITY OF KEY WEST
RICHARD A. HEYMAN
ENVIRONMENTAL PROTECTION FACILITY
RAS AND WAS PUMPS REPLACEMENT

MECHANICAL
ABBREVIATIONS

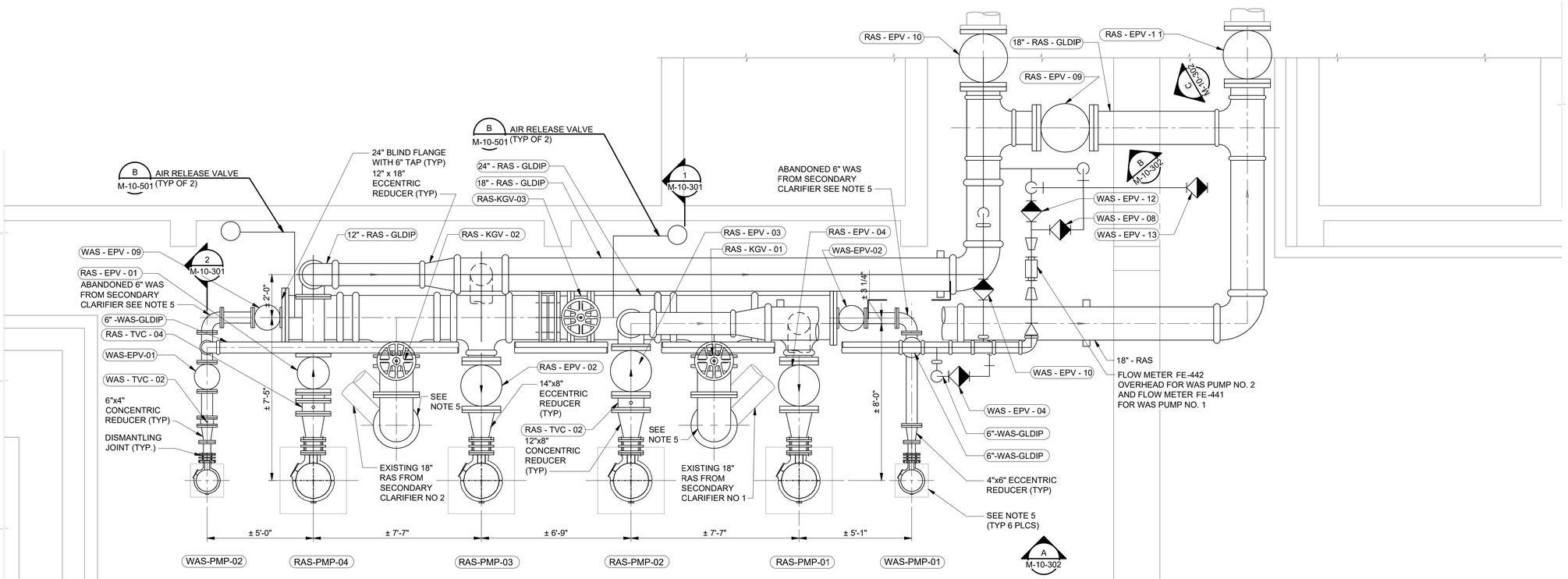
DESIGNED: MG
DETAILED: HT, AD
CHECKED: PG
APPROVED: IB
DATE: 02/01/2023

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
409283

M-00-002
SHEET
13 OF 27

FD9000
D409283



NOTES:

1. THE LOCATIONS, CONFIGURATIONS, AND ELEVATIONS OF EXISTING UTILITIES AND STRUCTURES (UNDERGROUND, SURFACE, OR OVERHEAD) ARE APPROXIMATE, AND NOT AT ALL UTILITIES AND FACILITIES ARE INDICATED. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION AND CONFIGURATION OF THE ITEMS BEING REPLACED PRIOR TO PROCEEDING WITH THE WORK.
2. PIPE SUPPORTS SHALL BE REPLACED AT THE SAME LOCATIONS AS EXISTING PIPE SUPPORTS. REFER TO TYPICAL DETAILS ON SHEET S-00-002 AND SPECIFICATION SECTION 15140.ADDITIONAL SUPPORTS MAY BE REQUIRED TO COMPLY WITH THE SPACING AND SUPPORT LOCATION REQUIREMENTS OF SPECIFICATION SECTION 15140. ADDITIONAL SUPPORTS SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER. ALL NON-HANGING METAL SUPPORTS SHALL BE PROVIDED WITH A CONCRETE BASE AS SHOWN IN THE TYPICAL PIPE SUPPORT BASE DETAIL ON SHEET S-00-003.
3. EXISTING CONCRETE PUMP BASES SHALL BE REUSED. CONTRACTOR TO INSPECT BASES PRIOR TO REUSE AND MAKE ANY NECESSARY REPAIRS PER SPECIFICATION SECTIONS 03920 AND 03930. REFER TO TYPICAL DETAIL ON DRAWING S-00-003 FOR PUMP ANCHORAGE.
4. EXISTING CONCRETE PIPE SADDLE SUPPORTS SHALL BE REUSED. CONTRACTOR TO INSPECT SADDLES PRIOR TO REUSE AND MAKE ANY NECESSARY REPAIRS PER SPECIFICATION SECTIONS 03920 AND 03930 AT NO ADDITIONAL COST TO THE OWNER. IN THE EVENT A SADDLE SUPPORT CANNOT BE REPAIRED, THE SADDLE SUPPORT SHALL BE REPLACED AT NO ADDITIONAL COST TO THE OWNER. REFER TO DRAWING S-00-002 FOR TYPICAL REPLACEMENT DETAILS.
5. PROVIDE CONCRETE COLLAR AT PIPE PENETRATION PER TYPICAL DETAIL ON DRAWING S-00-003.EXISTING PIPE TO REMAIN SHALL BE RECOATED PRIOR TO INSTALLATION OF CONCRETE COLLAR. SURFACE PREPARATION SHALL BE ABRASIVE BLAST CLEANING TO NAPF 500-03-04 AND COATING SYSTEM PER DATA SHEET 13S2 AS SPECIFIED IN SECTION 09940.
6. EXISTING WAFER CHECK VALVES SHALL BE REPLACED WITH HORIZONTAL SWING CHECK VALVES WHERE INSTALLATION IS FEASIBLE BASED ON LAYING LENGTH AND PENDING ENGINEER'S APPROVAL PER SPECIFICATION 15093. WHERE LAYING LENGTH IS NOT SUFFICIENT, WAFER CHECK VALVES SHALL BE REPLACED IN-KIND.

PUMP ROOM PLAN
3/8"=1'-0"

12" 6" 0 1' 2' 3' 4' 5' 6' 7'
3/8"=1'-0"

100% SUBMITTAL

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CITY OF KEY WEST
RICHARD A. HEYMAN
ENVIRONMENTAL PROTECTION FACILITY
RAS AND WAS PUMPS REPLACEMENT

MECHANICAL
PUMP ROOM - PLAN

DESIGNED: MG
DETAILED: HT, AD
CHECKED: PG
APPROVED: IB
DATE: 02/01/2023

0 1/2 1
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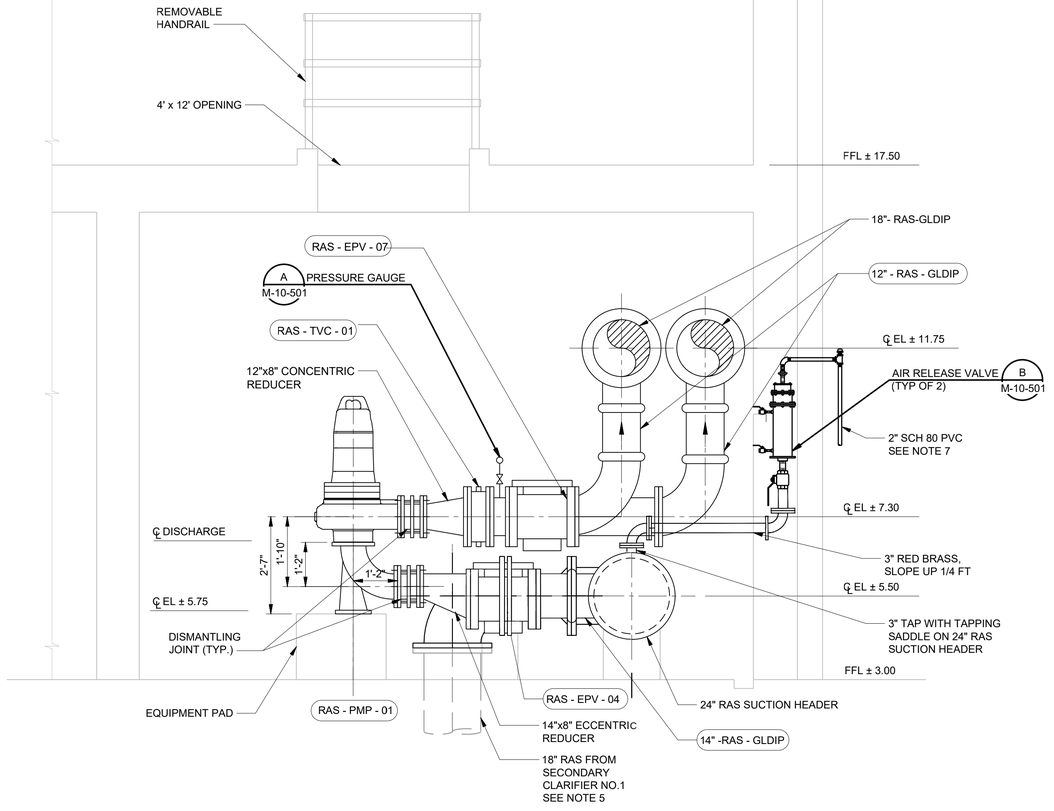
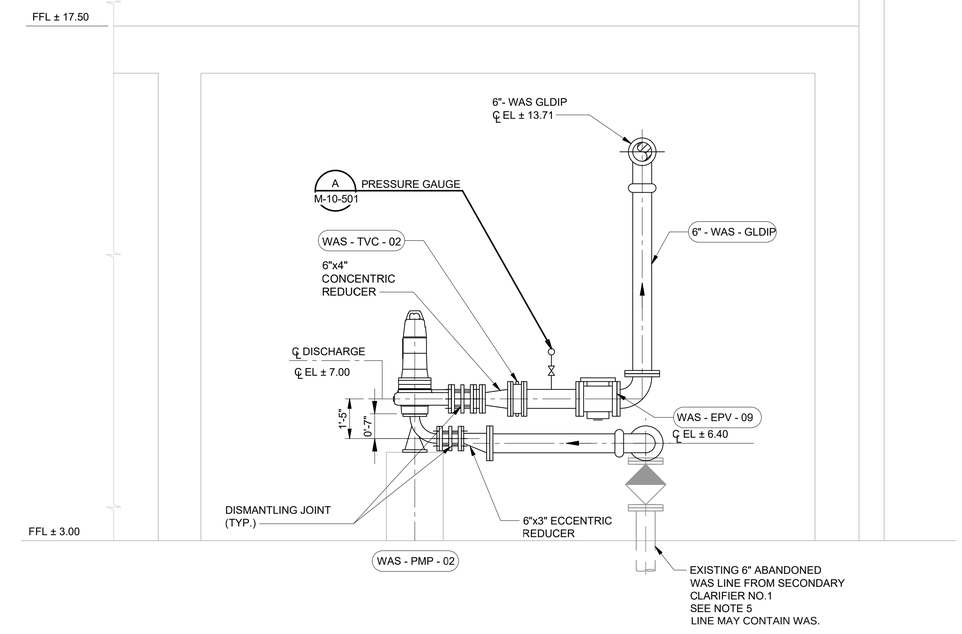
PROJECT NO.
409283

M-10-101
SHEET
14 OF 28

FB9000
D-409283



1 RAS PUMP SECTION (TYP 4)
M-10-101 1/2" = 1'-0"



2 WAS PUMP SECTION (TYP 2)
M-10-101 1/2" = 1'-0"

NOTES:

1. THE LOCATIONS, CONFIGURATIONS, AND ELEVATIONS OF EXISTING UTILITIES AND STRUCTURES (UNDERGROUND, SURFACE, OR OVERHEAD) ARE APPROXIMATE, AND NOT AT ALL UTILITIES AND FACILITIES ARE INDICATED. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION AND CONFIGURATION OF THE ITEMS BEING REPLACED PRIOR TO PROCEEDING WITH THE WORK.
2. PIPE SUPPORTS SHALL BE REPLACED AT THE SAME LOCATIONS AS EXISTING PIPE SUPPORTS. REFER TO TYPICAL DETAILS ON SHEET S-00-002 AND SPECIFICATION SECTION 15140. ADDITIONAL SUPPORTS MAY BE REQUIRED TO COMPLY WITH THE SPACING AND SUPPORT LOCATION REQUIREMENTS OF SPECIFICATION SECTION 15140. ADDITIONAL SUPPORTS SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER. ALL NON-HANGING METAL SUPPORTS SHALL BE PROVIDED WITH A CONCRETE BASE AS SHOWN IN THE TYPICAL PIPE SUPPORT BASE DETAIL ON SHEET S-00-003.
3. EXISTING CONCRETE PUMP BASES SHALL BE REUSED. CONTRACTOR TO INSPECT BASES PRIOR TO REUSE AND MAKE ANY NECESSARY REPAIRS PER SPECIFICATION SECTIONS 03920 AND 03930. REFER TO TYPICAL DETAIL ON DRAWING S-00-003 FOR PUMP ANCHORAGE.
4. EXISTING CONCRETE PIPE SADDLE SUPPORTS SHALL BE REUSED. CONTRACTOR TO INSPECT SADDLES PRIOR TO REUSE AND MAKE ANY NECESSARY REPAIRS PER SPECIFICATION SECTIONS 03920 AND 03930 AT NO ADDITIONAL COST TO THE OWNER. IN THE EVENT A SADDLE SUPPORT CANNOT BE REPAIRED, THE SADDLE SUPPORT SHALL BE REPLACED AT NO ADDITIONAL COST TO THE OWNER. REFER TO DRAWING S-00-002 FOR TYPICAL REPLACEMENT DETAILS.
5. PROVIDE CONCRETE COLLAR AT PIPE PENETRATION PER TYPICAL DETAIL ON DRAWING S-00-003. EXISTING PIPE TO REMAIN SHALL BE RECOATED PRIOR TO INSTALLATION OF CONCRETE COLLAR. SURFACE PREPARATION SHALL BE ABRASIVE BLAST CLEANING TO NAPF 500-03-04 AND COATING SYSTEM PER DATA SHEET 13S2 AS SPECIFIED IN SECTION 09940.
6. EXISTING WAFER CHECK VALVES SHALL BE REPLACED WITH HORIZONTAL SWING CHECK VALVES WHERE INSTALLATION IS FEASIBLE BASED ON LAYING LENGTH AND PENDING ENGINEER'S APPROVAL PER SPECIFICATION 15093. WHERE LAYING LENGTH IS NOT SUFFICIENT, WAFER CHECK VALVES SHALL BE REPLACED IN-KIND.
7. FIELD ROUTE AIR RELEASE VALVE VENT PIPE TO THE SOUTH WEST WALL OF THE PUMP ROOM AND ROUTE OUTSIDE THE BUILDING. ROUTING SHALL AVOID TRIPPING HAZARDS AND SHALL PROVIDE ADEQUATE PIPE SUPPORTS. THE ENGINEER SHALL APPROVE FINAL ROUTING PRIOR TO INSTALLATION. SEE DETAIL C ON SHEET M-10-301 FOR VENT DISCHARGE PIPE ARRANGEMENT.

12" 6" 0 1' 2' 3' 4' 5'
1/2"=1'-0"

100% SUBMITTAL

NO.	DATE	REVISIONS AND RECORD OF USE	BY	CHK	APP
	02/01/2023	100% SUBMITTAL		PG	IB
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1	09/28/2021	ISSUED FOR 60% SUBMITTAL	AD	PG	IB

Date:
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BLACK & VEATCH

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CITY OF KEY WEST
RICHARD A. HEYMAN
ENVIRONMENTAL PROTECTION FACILITY
RAS AND WAS PUMPS REPLACEMENT

MECHANICAL
PUMP ROOM - SECTIONS

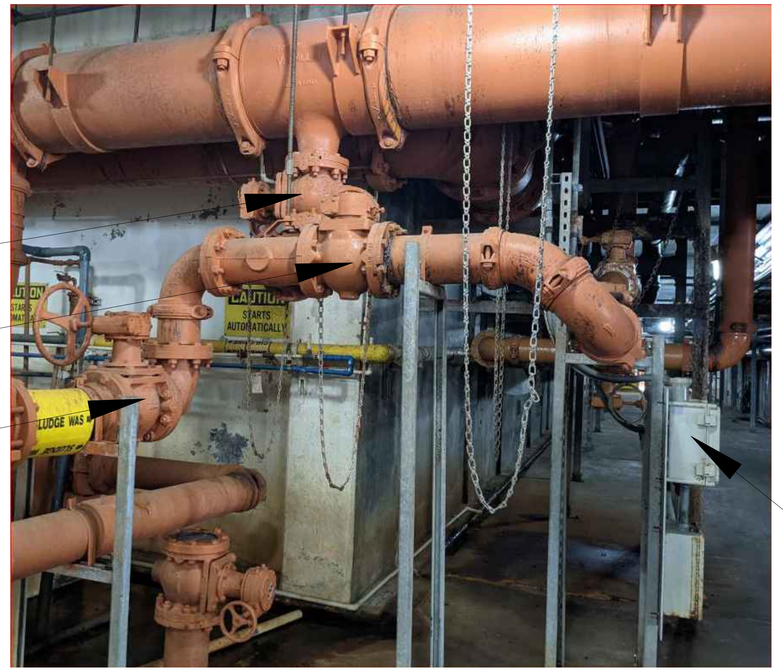
DESIGNED: MG
DETAILED: HT, AD
CHECKED: PG
APPROVED: IB
DATE: 02/01/2023

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

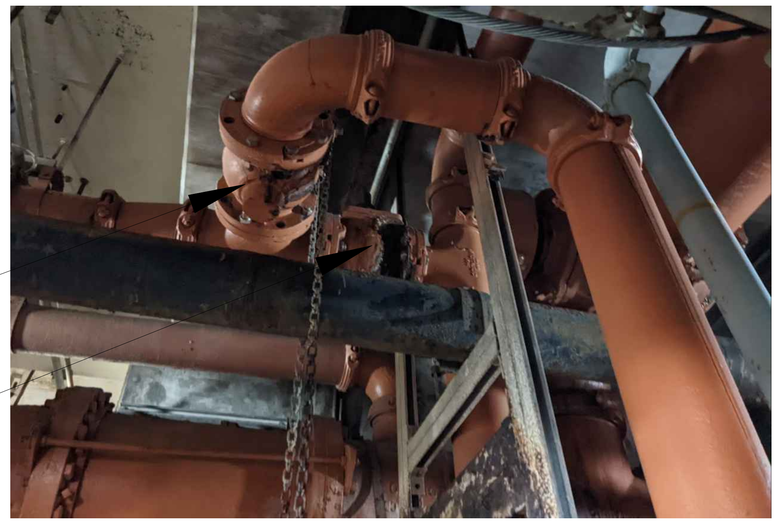
PROJECT NO.
409283

M-10-301
SHEET
15 OF 28

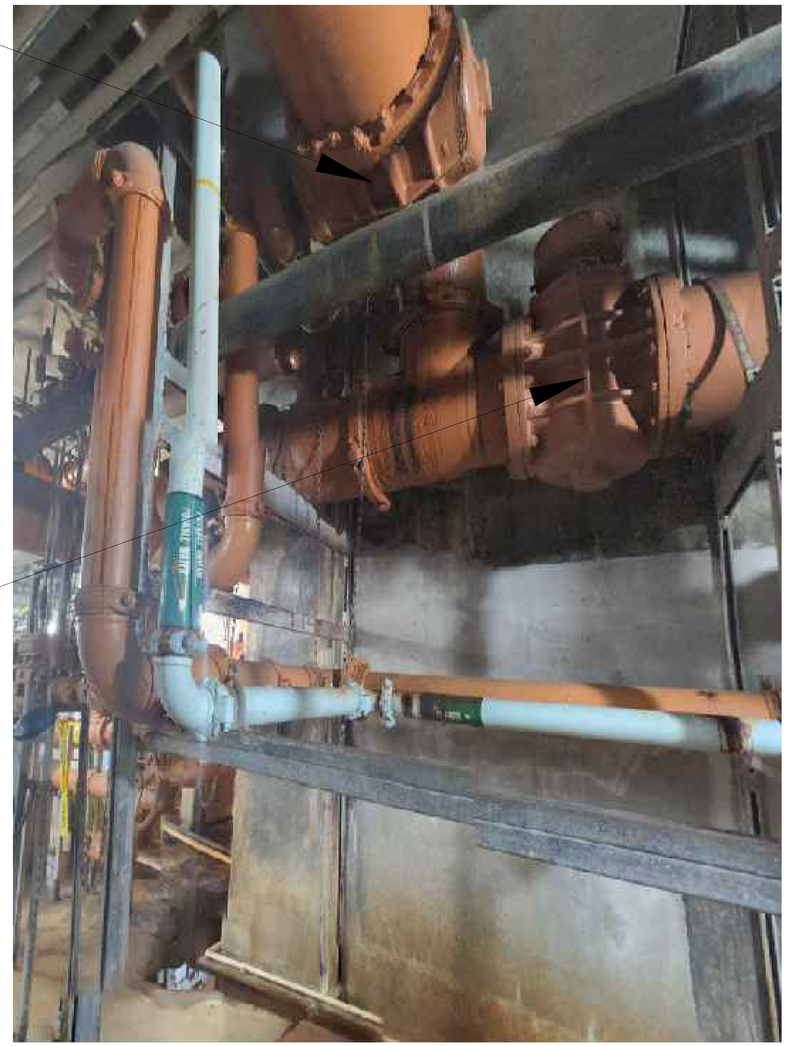
F090000
D409283



A FIGURE
(NTS)



B FIGURE
(NTS)



C FIGURE
(NTS)

100% SUBMITTAL

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CITY OF KEY WEST
RICHARD A. HEYMAN
ENVIRONMENTAL PROTECTION FACILITY
RAS AND WAS PUMPS REPLACEMENT

MECHANICAL
PUMP ROOM - SECTIONS

DESIGNED:	MG
DETAILED:	HT, AD
CHECKED:	PG
APPROVED:	IB
DATE:	02/01/2023

0 1/2 1
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PROJECT NO.
409283

M-10-302
SHEET
16 OF 28

F09000
D409283

TABLE 1- VALVE SCHEDULE

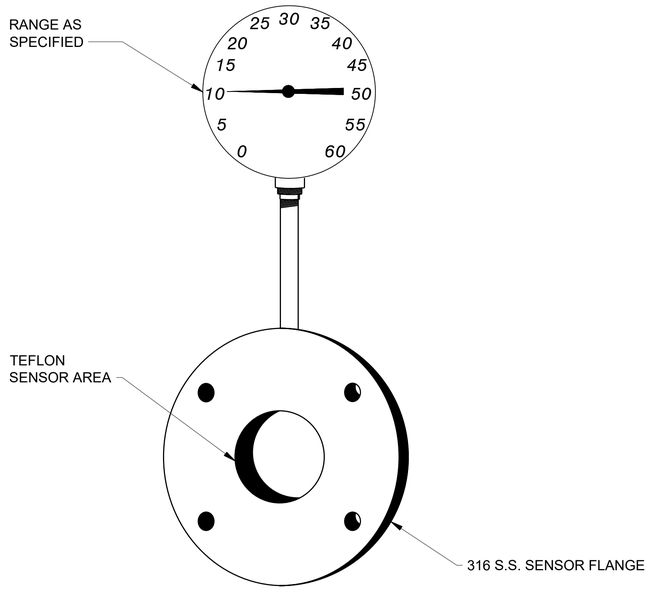
TAG NO.	SIZE (IN)	TYPE OF VALVE	SERVICE	DESIGN CAPACITY2 (gpm)	ENDS
WAS-TVC-01	6	Horizontal Swing Check1	RAS	260	Flange
WAS-TVC-02	6	Horizontal Swing Check1	RAS	260	Flange
RAS-TVC-01	12	Horizontal Swing Check1	RAS	1,580	Flange
RAS-TVC-02	12	Horizontal Swing Check1	RAS	1,580	Flange
RAS-TVC-03	12	Horizontal Swing Check1	RAS	1,580	Flange
RAS-TVC-04	12	Horizontal Swing Check1	RAS	1,580	Flange
RAS-KGV-01	18	Knife Gate	RAS	6,320	Flange
RAS-KGV-02	18	Knife Gate	RAS	6,320	Flange
RAS-KGV-03	24	Knife Gate	RAS	6,320	Flange
RAS-EPV-01	12	Eccentric Plug	RAS	1,580	Flange
RAS-EPV-02	14	Eccentric Plug	RAS	1,580	Flange
RAS-EPV-03	12	Eccentric Plug	RAS	1,580	Flange
RAS-EPV-04	14	Eccentric Plug	RAS	1,580	Flange
RAS-EPV-05	14	Eccentric Plug	RAS	1,580	Flange
RAS-EPV-06	14	Eccentric Plug	RAS	1,580	Flange
RAS-EPV-07	12	Eccentric Plug	RAS	1,580	Flange
RAS-EPV-08	12	Eccentric Plug	RAS	1,580	Flange
RAS-EPV-09	18	Eccentric Plug	RAS	6,320	Flange
RAS-EPV-10	18	Eccentric Plug	RAS	6,320	Flange
RAS-EPV-11	18	Eccentric Plug	RAS	6,320	Flange
WAS-EPV-01	6	Eccentric Plug	RAS	260	Flange
WAS-EPV-02	6	Eccentric Plug	RAS	260	Flange
WAS-EPV-03	6	Eccentric Plug	RAS	260	Flange
WAS-EPV-04	6	Eccentric Plug	RAS	520	Flange
WAS-EPV-05	6	Eccentric Plug	RAS	520	Flange
WAS-EPV-06	6	Eccentric Plug	RAS	520	Flange
WAS-EPV-07	6	Eccentric Plug	RAS	520	Flange
WAS-EPV-08	6	Eccentric Plug	RAS	520	Flange
WAS-EPV-09	6	Eccentric Plug	RAS	260	Flange
WAS-EPV-10	6	Eccentric Plug	RAS	520	Flange
WAS-EPV-11	6	Eccentric Plug	RAS	520	Flange
WAS-EPV-12	6	Eccentric Plug	RAS	520	Flange
WAS-EPV-13	6	Eccentric Plug	RAS	520	Flange

NOTES:

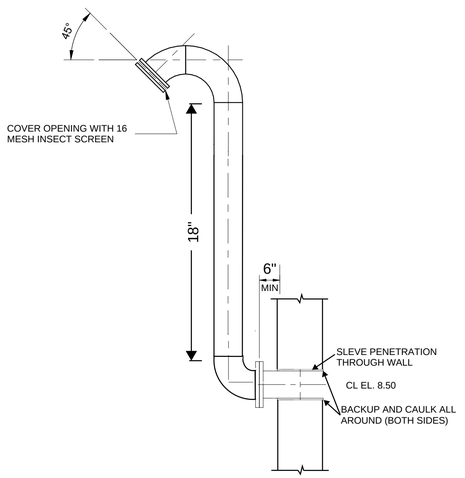
1. EXISTING WAFER CHECK VALVES SHALL BE REPLACED WITH HORIZONTAL SWING CHECK VALVES WHERE INSTALLATION IS FEASIBLE BASED ON LAYING LENGTH AND PENDING ENGINEER'S APPROVAL PER SPECIFICATION 15093. WHERE LAYING LENGTH IS NOT SUFFICIENT, WAFER CHECK VALVES SHALL BE REPLACED IN-KIND.
2. DESIGN CAPACITY IS BASED ON RATED CAPACITY OF RAS AND WAS PUMPS.

TABLE 2- HARNESS RODS FOR PUMP DISCHARGE PIPING

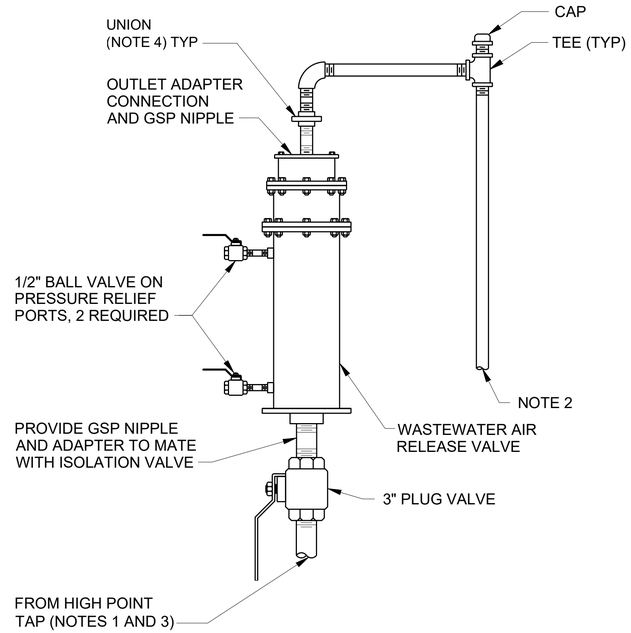
PIPE SIZE	NO. OF HARNESS RODS	DIA OF HARNESS RODS
3"	4	3/4"
8"	4	3/4"



A M-10-301 PRESSURE GAUGE WITH ANNULAR TYPE DIAPHRAGM SEAL INSTALLATION DETAIL
(NO SCALE)



C M-10-301 VENTILATION PIPE TERMINATION POINT
(NO SCALE)



B M-10-301 WASTEWATER AIR RELEASE VALVE DETAIL
(NO SCALE)

NOTES:

1. THE LINE BETWEEN THE TAP AND ARV SHALL CONTINUOUSLY SLOPE UPWARD TO TO ARV
2. FIELD ROUTE AIR RELEASE VALVE VENT PIPE TO THE SOUTH WEST WALL OF THE PUMP ROOM AND ROUTE OUTISDE THE BUILDING PER DETAIL C. ROUTING SHALL AVOID TRIPPING HAZARDS AND SHALL PROVIDE PIPE BRACING AND SUPPORTS. THE ENGINEER SHALL APPROVE FINAL ROUTING PRIOR TO INSTALLATION.
3. FOR ALLOWABLE PIPE AND VALVE MATERIALS, SEE SPECIFICAITON SECTION 15060. PROVIDE SYSTEM-SPECIFIC MATERIALS THROUGH UNION.
4. PROVIDE DIALETRIC UNION FOR DISSIMILAR METALS.

100% SUBMITTAL

NO.	BY	CHK	APP	DATE	REVISIONS AND RECORD OF USE
2	AD	PG	IB	02/01/2023	100% SUBMITTAL
1	AD	PG	IB	10/10/2022	95% SUBMITTAL
				09/28/2021	ISSUED FOR 60% SUBMITTAL

Date:
Engineer of Record:
Florida License No.:

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Coral Springs, FL 33134
Certificate No. 8132

CITY OF KEY WEST
RICHARD A. HEYMAN
ENVIRONMENTAL PROTECTION FACILITY
RAS AND WAS PUMPS REPLACEMENT

MECHANICAL
MISCELLANEOUS MECHANICAL DETAILS

DESIGNED: MG
DETAILED: HT, AD
CHECKED: PG
APPROVED: IB
DATE: 02/01/2023

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

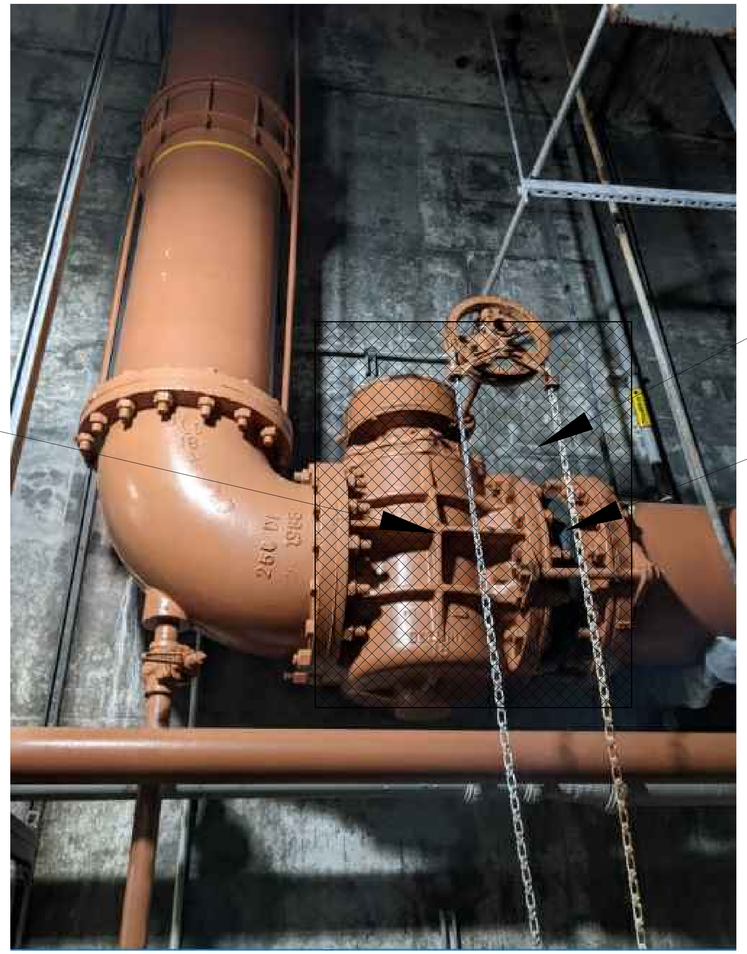
PROJECT NO.
409283

M-10-501
SHEET
17 OF 28

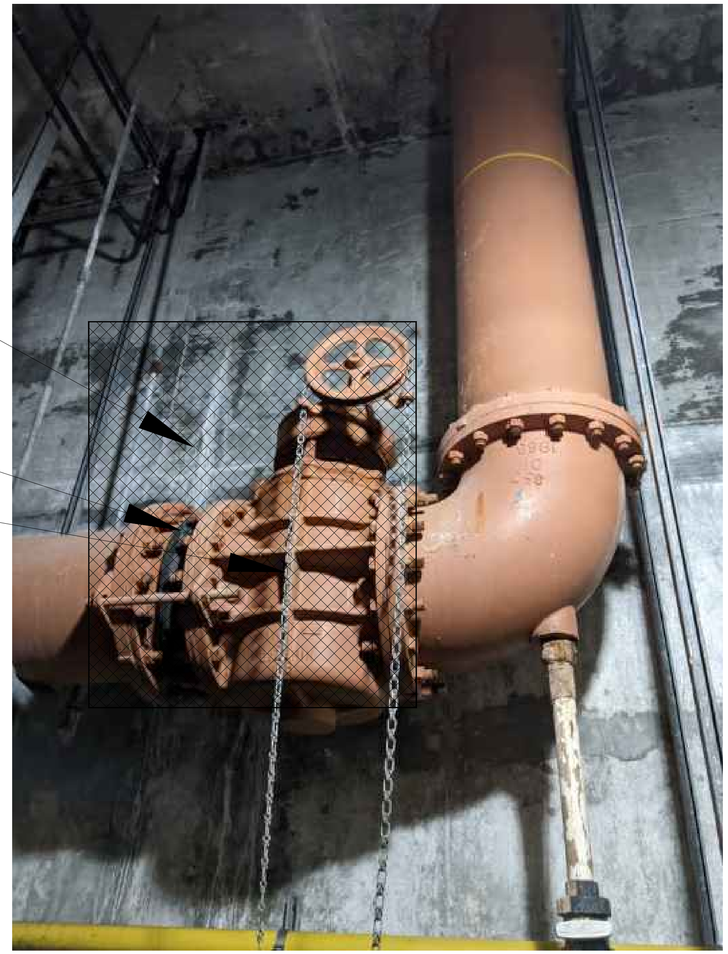
FD9000
D409283

NOTES :

1. REMOVE AND REPLACE EXISTING 18" DEZURIK PLUG VALVES AND DISMANTLING JOINTS IN-KIND.
2. REFER TO SHEET C-00-102 FOR LOCATION.
3. CONTRACTOR SHALL PROVIDE LINE ISOLATION VIA HOT TAP OR ANY OTHER MEANS AS DEEMED NECESSARY FOR THE REPLACEMENT OF THE VALVES.



EAST VALVE SECTION
NTS



WEST VALVE SECTION
NTS

100% SUBMITTAL

NO.	DATE	REVISIONS AND RECORD OF USE	BY	CHK	APP
	02/01/2023	100% SUBMITTAL			
	10/10/2022	95% SUBMITTAL	2	AD	PG	IB
	09/28/2021	ISSUED FOR 66% SUBMITTAL	1	AD	PG	IB

Date:
Engineer of Record:
Florida License No.:

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CITY OF KEY WEST
RICHARD A. HEYMAN
ENVIRONMENTAL PROTECTION FACILITY
RAS AND WAS PUMPS REPLACEMENT

MECHANICAL
AERATION BASINS UTILIDOR

DESIGNED: MG
DETAILED: HT, AD
CHECKED: PG
APPROVED: IB
DATE: 02/01/2023

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
409283

M-20-101
SHEET
18 OF 28

F09000
D409283

ELECTRICAL LEGENDS

ONE-LINE DIAGRAM LEGEND

1500KVA
2.4KV Δ - 480Y/277V
3-PH, 60HZ
TRANSFORMER WITH PRIMARY AND SECONDARY VOLTAGE, AND KVA RATING AS NOTED

CS 4#14,3/4"
20 3P-60 22:3#8,#10G, 4#14,2"
CIRCUIT NO.22 WITH 3#8 INSULATED CONDUCTORS AND 1#10 GROUND WIRE FOR A 20HP MOTOR WITH 3 POLE, 60A, MOTOR DISCONNECT SWITCH AND 4#14 INSULATED CONDUCTORS FOR AUXILIARY ITEM, AS FOR EXAMPLE A CONTROL STATION, ALL IN 2" CONDUIT.

AUXILIARY ITEMS MAY NOT BE COMPLETELY SHOWN
HS
20 3P-60 22:3#8,#10G 4#14,2"
CONDUCTORS FOR AUXILIARY ITEM SHALL NOT PASS THROUGH MOTOR DISCONNECT SWITCH.

AUXILIARY ITEMS MAY NOT BE COMPLETELY SHOWN
15
ONE-LINE SHOWING POWER AND CONTROL TO A PACKAGE UNIT, AS FOR EXAMPLE A STEAM GENERATOR OR AN AIR HANDLING UNIT, SHALL IMPLY THAT ANY AND ALL ASSOCIATED EQUIPMENT SHALL ALSO BE INSTALLED AND WIRED AS REQUIRED BY THE EQUIPMENT FURNISHED.

INDICATES THAT ALL OR PART OF CIRCUIT MAY BE ROUTED IN DUCT BANK OR UNDERGROUND. CONDUIT SIZE SHOWN ON ONE-LINE IS ABOVE GROUND AND/OR INSIDE OF STRUCTURE. SEE DUCT BANK SCHEDULE AND SECTIONS FOR CONDUIT SIZE OF UNDERGROUND PORTION OF CIRCUIT.

HIGH VOLTAGE DRAWOUT AIR OR VACUUM CIRCUIT BREAKER

3P-20
LOW VOLTAGE AIR CIRCUIT BREAKER, 3 POLE, 20 AMPERE

S4
SIZE 4 COMBINATION MAGNETIC MOTOR STARTER

LOW VOLTAGE DRAWOUT AIR CIRCUIT BREAKER

HIGH VOLTAGE DRAWOUT CONTACTOR

FUSE AND DISCONNECT SWITCH

S2
SIZE 2 COMBINATION MAGNETIC MOTOR STARTER, REVERSING OR 2 SPEED

S1
SIZE 1 COMBINATION REDUCED VOLTAGE AUTOTRANSFORMER

POTENTIAL TRANSFORMER

CURRENT TRANSFORMER

CURRENT OR POTENTIAL TEST SWITCH

G GENERATOR

K KIRK KEY INTERLOCK

E ELECTRICAL INTERLOCK

R RESISTOR

59G PROTECTION RELAY WITH IEEE DEVICE FUNCTION AS SHOWN

V SINGLE-FUNCTION METER

SURGE OR LIGHTNING ARRESTER

SURGE ARRESTER WITH SURGE CAPACITOR

GROUND CONNECTION

SCHEMATIC SYMBOLS

- WIRE CONNECTION POINT
- EXTERNAL CONNECTION POINT
- NORMALLY OPEN CONTACT
- NORMALLY CLOSED CONTACT
- STARTER, CONTACTOR OR RELAY COIL
- NORMALLY OPEN PUSH BUTTON
- NORMALLY CLOSED PUSH BUTTON
- MAINTAINED PUSH BUTTON
- NORMALLY CLOSED GEARED LIMIT SWITCH
- NORMALLY OPEN GEARED LIMIT SWITCH
- INDICATING LIGHT
- FUSE
- POTENTIOMETER
- CAPACITOR
- DIODE
- RESISTOR
- CONTROL POWER TRANSFORMER
- SWITCH
- MS MANUAL STARTER
- OL OVERLOAD
- OVERLOAD
- ELECTRODE
- FLOAT SWITCH (CLOSING ON RISING LEVEL)
- FLOAT SWITCH (OPENING ON RISING LEVEL)
- P PRESSURE SWITCH (CLOSING ON RISING PRESSURE)
- P PRESSURE SWITCH (OPENING ON RISING PRESSURE)
- V VACUUM SWITCH (CLOSING ON INCREASING VACUUM)
- V VACUUM SWITCH (OPENING ON INCREASING VACUUM)
- TEMPERATURE SWITCH (CLOSING ON RISING TEMPERATURE)
- TEMPERATURE SWITCH (OPENING ON RISING TEMPERATURE)
- FLOW ACTUATED SWITCH (CLOSING ON INCREASE IN FLOW)
- FLOW ACTUATED SWITCH (OPENING ON INCREASE IN FLOW)
- ON TIME DELAY CONTACT (NORMALLY OPEN, WHEN THE COIL IS ENERGIZED THE CONTACT WILL CLOSE AFTER A TIME DELAY)
- ON TIME DELAY CONTACT (NORMALLY CLOSED, WHEN THE COIL IS ENERGIZED THE CONTACT WILL OPEN AFTER A TIME DELAY)
- OFF TIME DELAY CONTACT (NORMALLY OPEN, WHEN THE COIL IS DE-ENERGIZED THE CONTACT WILL OPEN AFTER A TIME DELAY)
- OFF TIME DELAY CONTACT (NORMALLY CLOSED, WHEN THE COIL IS DE-ENERGIZED THE CONTACT WILL CLOSE AFTER A TIME DELAY)
- TORQUE SWITCH (NORMALLY OPEN)
- TORQUE SWITCH (NORMALLY CLOSED)
- LIMIT SWITCH (NORMALLY OPEN)
- LIMIT SWITCH (NORMALLY CLOSED)
- LIMIT SWITCH (NORMALLY CLOSED, HELD OPEN)
- DIFFERENTIAL PRESSURE SWITCH (NORMALLY OPEN, CLOSING ON INCREASING DIFF.)
- DIFFERENTIAL PRESSURE SWITCH (NORMALLY CLOSED, OPENING ON INCREASING DIFF.)

SWITCH & OUTLET SYMBOLS

- S SINGLE POLE SWITCH
- S_2 TWO POLE SWITCH
- S_{3A} THREE-WAY SWITCH CONTROLLING LIGHTS WITH "A" DESIGNATION
- S_4 FOUR-WAY SWITCH
- S^{C1}_{M} MOMENTARY SWITCH CONTROLLING CONTACTOR C1
- S^{DM}_{A} DIMMING WALL SWITCH CONTROLLING LIGHTS WITH "A" DESIGNATION
- S^{OS}_{A} WALL SWITCH OCCUPANCY SENSOR CONTROLLING LIGHTS WITH "A" DESIGNATION
- DUPLEX RECEPTACLE 120 VOLT
- SIMPLEX RECEPTACLE
- RANGE RECEPTACLE
- TWISTLOCK RECEPTACLE
- 30 240V, 1Ø RECEPTACLE, TYPICAL AMPERE RATING NOTED
- 60 480V, 3Ø WELDING RECEPTACLE, TYPICAL AMPERE RATING NOTED
- 120 VOLT DUPLEX RECEPTACLE (UPS)
- DUPLEX FLOOR OUTLET
- TELEPHONE OUTLET
- TELEPHONE FLOOR OUTLET
- CX COAXIAL CABLE OUTLET
- DATA NETWORK OUTLET

MISCELLANEOUS SYMBOLS

- STROBE
- HORN & STROBE
- HORN
- T THERMOSTAT
- J JUNCTION BOX
- GROUND ROD
- GROUND ROD WITH TEST WELL
- GROUND CONNECTION
- DISCONNECT SWITCH
- COMBINATION STARTER
- POWER PANEL
- LIGHTING PANEL
- MISCELLANEOUS PANEL
- LIGHTING CONTACTOR
- CAMERA
- PE PHOTOELECTRIC SENSOR, PHOTOCELL
- OS CEILING MOUNTED OCCUPANCY SENSOR
- OS WALL MOUNTED OCCUPANCY SENSOR

BREAKER DETAILS

DETAIL A

52
5KV
1200A
49KA
A 5KV CLASS MEDIUM-VOLTAGE, DRAWOUT, VACUUM OR AIR INSULATED CIRCUIT BREAKER WITH A 1,200 AMPERE FRAME. BREAKER HAS A 49,000 AMPERE MAXIMUM FAULT CURRENT INTERRUPTING RATING.

DETAIL B

3P-50
A LOW VOLTAGE FIXED MOUNTED MOLDED CASE CIRCUIT BREAKER WITH A 50 AMPERE TRIP RATING.
TRIP UNIT IS NON-ADJUSTABLE THERMAL-MAGNETIC TYPE.

1000AT
1200AF
SST
LSIG
AFRD
A LOW VOLTAGE FIXED MOUNTED MOLDED CASE CIRCUIT BREAKER WITH A 1200 AMPERE FRAME AND A 1000 AMPERE TRIP RATING.
TRIP UNIT IS ADJUSTABLE SOLID-STATE TYPE WITH LONG-TIME, SHORT-TIME, INSTANTANEOUS, GROUND FAULT AND ARC-FLASH REDUCTION PROTECTION FEATURES.

DETAIL C

800AT
1000AS
1600AF
AFRD
A LOW VOLTAGE, DRAWOUT, POWER OR INSULATED CASE CIRCUIT BREAKER WITH A 1600A FRAME AND SOLID-STATE TRIP UNIT.
TRIP UNIT HAS A SENSOR MODULE RATED FOR 1000 AMPERES AND WITH A TRIP RATING OF 800 AMPERES AND ARC-FLASH REDUCTION PROTECTION FEATURES.

CONDUIT & WIRING INSTALLATION LEGEND

- CONDUIT EXPOSED
- CONDUIT CONCEALED
- CONDUIT TURNING UP. CONDUIT TURNING DOWN.
- CONDUIT PLUGGED FLUSH. CONDUIT CAPPED.
- L2 - 5 TYPICAL FOR HOME RUN TO BE ROUTED TO LIGHTING PANEL L2 & CONNECTED TO CIRCUIT #5 (MINIMUM NO. 12 AWG CONDUCTORS AND 3/4" CONDUIT)
- 1 LP1-1 A POLE OR STANCHION MOUNTED LIGHTING FIXTURE. REFER TO NUMBER OR LETTER IN FIXTURE SCHEDULE. POWERED FROM LIGHTING PANEL LP1, CIRCUIT 1. CONTROLLED VIA FROM SWITCH A.
- 1 LP1-1 A WALL MOUNTED LIGHTING FIXTURE. REFER TO NUMBER OR LETTER IN FIXTURE SCHEDULE. POWERED FROM LIGHTING PANEL LP1, CIRCUIT 1. CONTROLLED VIA FROM SWITCH A.
- 1 LP1-1 A CEILING, PENDANT, OR RECESSED LIGHTING FIXTURE. REFER TO NUMBER OR LETTER IN FIXTURE SCHEDULE. POWERED FROM LIGHTING PANEL LP1, CIRCUIT 1. CONTROLLED VIA FROM SWITCH A.
- LP1-1 RECEPTACLE POWERED FROM LIGHTING PANEL LP1, CIRCUIT 1.
- LP1-1 A 1 LINEAR LIGHTING FIXTURE. REFER TO FIXTURE NUMBER IN FIXTURE SCHEDULE. POWERED FROM LIGHTING PANEL LP1, CIRCUIT 1, VIA SWITCH A.
- LP1-1 EX EXIT LIGHTING FIXTURE. REFER TO FIXTURE NUMBER OR LETTERS IN FIXTURE SCHEDULE. POWERED FROM LIGHTING PANEL 1, CIRCUIT 1.
- LP1-1 EM EMERGENCY LIGHTING FIXTURE. REFER TO FIXTURE NUMBER OR LETTERS IN FIXTURE SCHEDULE. POWERED FROM LIGHTING PANEL 1, CIRCUIT 1.
- E UNDERGROUND CONCRETE ENCASED ELECTRICAL DUCT BANK
- UNDERGROUND CONCRETE ENCASED ELECTRICAL BANK ROUTED BENEATH SLAB-ON-GRADE
- EE DIRECT BURIED CONDUIT
- GROUND CONDUCTOR
- UE UE UNDERGROUND ELECTRIC
- OH OH OVERHEAD CIRCUIT

COMMUNICATION SYMBOLS

- HORN SPEAKER
- DUAL HORN SPEAKER
- WALL MOUNTED CONE SPEAKER
- SK CEILING MOUNTED CONE SPEAKER

PROTECTION/RELAY DEVICE NUMBERS

25 - SYNCHRONIZING OR SYNCHRONISM-CHECK DEVICE
27 - UNDERVOLTAGE RELAY
32 - DIRECTIONAL POWER RELAY
37 - UNDERCURRENT OR UNDERPOWER RELAY
46 - REV. PHASE OR PHASE-BAL. CURRENT RELAY
47 - PHASE SEQ. OR PHASE BAL. VOLTAGE RELAY
49 - MACHINE OR TRANSFORMER THERMAL RELAY
50 - INSTANTANEOUS OVERCURRENT
51 - AC TIME OVERCURRENT RELAY
52 - AC CIRCUIT BREAKER
59 - OVERVOLTAGE RELAY
63 - PRESSURE SWITCH
64 - GROUND DETECTOR RELAY
67 - AC DIRECTIONAL OVERCURRENT RELAY
71 - LIQUID OR GAS LEVEL RELAY
81 - FREQUENCY RELAY
83 - AUTOMATIC SELECTIVE CONTROL OR TRANSFER RELAY
86 - LOCKOUT RELAY
87 - DIFFERENTIAL PROTECTIVE RELAY

NO.	DATE	REVISIONS AND RECORD OF USE	BY	CHK	APP
	02/01/2023	100% SUBMITTAL			
	09/02/2022	90% SUBMITTAL			
1	09/28/2021	ISSUED FOR 60% SUBMITTAL	AD	PG	IB

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Certificate No. 8132

CITY OF KEY WEST
RICHARD A. HEYMAN
ENVIRONMENTAL PROTECTION FACILITY
RAS AND WAS PUMPS REPLACEMENT

ELECTRICAL LEGENDS

DESIGNED: DG
DETAILED: HT, AD
CHECKED: RRB
APPROVED: RRB
DATE: 02/01/2023

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
409283

E-00-001
SHEET
19 OF 27

100% SUBMITTAL

F0199222
D4409283

ELECTRICAL ABBREVIATIONS & NOTES

ELECTRICAL GENERAL NOTES

1. SOLID LINES (————————) INDICATE NEW WORK OR EQUIPMENT.
2. SCREENED LINES (————————) INDICATE EXISTING WORK OR EQUIPMENT.
3. DASHED LINES (– – – – – – – –) INDICATE FUTURE WORK OR EQUIPMENT.
4. REFER TO INDIVIDUAL DISCIPLINE CONTRACT DRAWINGS FOR ADDITIONAL ABBREVIATIONS, DETAILS, AND GENERAL DESIGN NOTES.
5. LEGEND SHEETS ARE GENERAL. SOME SYMBOLS AND ABBREVIATIONS MAY NOT BE UTILIZED ON THIS SPECIFIC PROJECT.
6. INFORMATION RELATED TO CIRCUIT IDENTIFICATION, WIRE & CONDUIT SIZES, AND ROUTING, IS ON THE FOLLOWING DRAWING TYPES.

   A. *ONE-LINE DIAGRAMS SHOW CIRCUIT IDENTIFICATION, WIRE QUANTITY AND SIZES, AND CONDUIT SIZE WITHIN STRUCTURES. ONE-LINE DIAGRAMS ALSO INDICATE ORIGIN AND DESTINATION OF CIRCUITS, AND IDENTIFY CIRCUITS ROUTED UNDERGROUND.*

   B. *FOR CIRCUITS WITHOUT UNDERGROUND PORTIONS, BUILDING FLOOR PLANS SHOW LOCATION OF EQUIPMENT FOR DETERMINING CIRCUIT LENGTH WITHIN THE STRUCTURE. FOR CIRCUITS WITH UNDERGROUND PORTIONS, ANTICIPATED PENETRATION OF UNDERGROUND CONDUITS ARE SHOWN ON STRUCTURE PLANS FOR DETERMINING THE LENGTH OF THE IN-STRUCTURE PORTIONS OF CIRCUITS. BUILDING FLOOR PLANS MAY ALSO SHOW HOME RUNS FOR LIGHTING, RECEPTACLE, AND OTHER MISCELLANEOUS EQUIPMENT CIRCUITS.*

   C. *SITE PLANS INDICATE THE GENERAL ROUTING OF UNDERGROUND CONDUITS AND DUCT BANKS. CIRCUITS ROUTED IN UNDERGROUND CONDUITS OR DUCT BANKS ARE INDICATED IN DUCT BANK SECTIONS REFERENCED ON THE SITE PLAN.*

   D. *DUCT BANK SECTIONS AND SCHEDULES IDENTIFY CONDUIT SIZE, CONDUIT MATERIAL, ARRANGEMENT OF THE UNDERGROUND CONDUITS, AND CIRCUITS ROUTED IN EACH UNDERGROUND CONDUIT.*

AREA DESIGNATIONS

THE SPECIAL AREA DESIGNATION BOXES, AS DEFINED BELOW, ARE LOCATED ON THE PLAN DRAWINGS TO DEFINE ELECTRICAL INSTALLATION REQUIREMENTS. DESIGNATION BOXES ARE LOCATED WITHIN ROOM OR BELOW ROOM NUMBER. ALL INDOOR AREAS NOT INDICATED OTHERWISE ARE AREA TYPE 1 AND MINIMUM NEMA TYPE 1 ENCLOSURES.

AREA TYPE 1A	CORROSIVE CHEMICAL FEED AND STORAGE ROOMS. CONDUIT SYSTEM SHALL BE EXPOSED SCHEDULE 80 PVC RIGID NON-METALLIC CONDUIT WITH PVC FITTINGS, BOXES AND ACCESSORIES.
AREA TYPE 4	INDOOR WET LOCATIONS SUCH AS VAULTS, HOSEDOWN AREAS, BASEMENTS, ETC. MINIMUM NEMA TYPE 4 ENCLOSURE FOR EQUIPMENT AND GASKETED FITTINGS IN A CONDUIT SYSTEM.
AREA TYPE 7A	CLASS I, DIVISION 1 AREA AS DEFINED BY NEC. ALL EQUIPMENT AND CONDUIT SYSTEMS SHALL BE RATED FOR USE IN THIS AREA.
AREA TYPE 7B	CLASS I, DIVISION 2, GROUP C AND D (METHANE, GASOLINE) AS DEFINED BY NEC. EQUIPMENT AND CONDUITS SYSTEMS SHALL BE RATED FOR USE IN THIS AREA.
AREA TYPE 12	INDOOR, DRY, DIRTY AREA. REQUIRES MINIMUM NEMA TYPE 12 GASKETED ENCLOSURES FOR ALL EQUIPMENT AND GASKETED FITTINGS IN CONDUIT SYSTEMS.

GENERAL REQUIREMENTS

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ROUTING ALL CONDUITS NOT SHOWN ON THE PLANS. THIS SHALL INCLUDE ALL CONDUITS SHOWN ON THE ONE-LINES AND HOME-RUNS SHOWN ON THE PLAN DRAWINGS. CONDUITS SHALL BE ROUTED AS DEFINED IN THE SPECIFICATION.
2. SPARE WIRES SHALL BE TAPED AND COILED AND LABELED TO INDICATE WHERE OTHER END OF SPARE WIRE IS LOCATED.
3. IF EQUIPMENT SUPPLIED BY MANUFACTURER HAS A LARGER LOAD THAN VALUE SHOWN, THE CABLE CONDUIT AND ELECTRICAL EQUIPMENT SHALL BE ENLARGED, AS REQUIRED, TO ACCOMMODATE THE HIGHER VALUE.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING PROPERLY SIZED STARTER OVERLOADS FOR EQUIPMENT FURNISHED.
5. LIGHTING AND RECEPTACLE CIRCUITS DESIGNATED ON THE FLOOR PLANS ARE NOT SHOWN ON THE ONE-LINES. CONDUCTORS FOR LIGHTING, RECEPTACLES, AND MISCELLANEOUS 120VAC CIRCUITS SHALL BE MINIMUM NO. 12AWG. CONDUIT FOR LIGHTING, RECEPTACLES, AND MISCELLANEOUS 120VAC CIRCUITS SHALL BE MINIMUM 3/4".
6. IN AREAS WHERE THERE ARE OVERHEAD BRIDGE CRANES, HOISTS, ETC. NO CONDUITS SHALL BE RUN OVERHEAD THAT WILL INTERFERE WITH THE OPERATION OF THE EQUIPMENT.

ELECTRICAL ABBREVIATIONS

A

A	AMBER, AMPERE, ALARM
AC	ALTERNATING CURRENT
ACB	AIR CIRCUIT BREAKER
ACR	ACCESS CARD READER
AF	AMPERE FRAME
AFD	ADJUSTABLE FREQUENCY DRIVE
AFRD	ARC-FLASH REDUCTION DEVICE
AM	AMMETER
ANN	ANNUNCIATOR
AR	ALARM RELAY
AS	AMMETER SWITCH, AMPERE SENSOR
AT	AMPERE TRIP
ATS	AUTOMATIC TRANSFER SWITCH
AUX	AUXILIARY
AWG	AMERICAN WIRE GAUGE

B

B	BUS
BC	BATTERY CHARGER
BKR	BREAKER
BR	BRAKE
BT	BEARING TEMPERATURE

C

C	CLOSE, COUNTER, CONTACTOR, CONTROL, CCTV CAMERA
CAP	CAPACITOR
CB	CIRCUIT BREAKER
CB"A"	CIRCUIT BREAKER AUXILIARY CONTACT (OPEN WHEN BREAKER IS OPEN)
CB"B"	CIRCUIT BREAKER AUXILIARY CONTACT (CLOSED WHEN BREAKER IS OPEN)
CD	CONTROL DAMPER
CI	CELL INTERLOCK
CKT	CIRCUIT
CL2	CHLORINE
COS	CABLE OPERATED SWITCH
CP	CONTROL PANEL
CPT	CONTROL POWER TRANSFORMER
CR	CURRENT OF CONTROL RELAY, CARD READER
CS	CONTROL STATION
CT	CYCLE TIMER OR CURRENT TRANSFORMER
CTC	CYCLE TIMER CLUTCH
CTM	CYCLE TIMER MONITOR
2/C	2 CONDUCTOR
4"C	4" CONDUIT

D

DC	DIRECT CURRENT, DOOR CONTACT
DI	DOOR INTERLOCK
DM	DAMPER MOTOR, DEMAND METER, DIMMER SWITCH
DPDT	DOUBLE POLE DOUBLE THROW
DPST	DOUBLE POLE SINGLE THROW
DPR	DIFFERENTIAL PRESSURE REGULATOR
DPS	DIFFERENTIAL PRESSURE SWITCH
DS	DISCONNECT SWITCH, DOOR SWITCH, DESKTOP STATION
DVLS	DISCHARGE VALVE LIMIT SWITCH

E

E	ELECTRIC OPERATOR FOR CONTROL DAMPER OR VALVE
EC	EMPTY CONDUIT
EDS	ELECTRICAL DOOR STRIKE
EL	ELEVATION, EMERGENCY LIGHT
EMH	ELECTRICAL MANHOLE
ER	ELECTRODE RELAY
ES	END SWITCH, REQUEST TO EXIT SENSOR
E-STOP	EMERGENCY STOP
ETM	ELAPSED TIME METER
EX	EXISTING
EXP	EXPLOSION PROOF

F

F	FORWARD, FIELD
FO	FIBER OPTIC
FPR	FEEDER PROTECTION RELAY
FS	FLOW SWITCH

G

G	GREEN, GROUND, GENERATOR, GROUND FAULT
GD	GROUND DETECTOR
GEN	GENERATOR
GFCI,GFI	GROUND FAULT CURRENT INTERRUPTOR, GROUND FAULT INTERRUPTOR
GLS	GEARED LIMIT SWITCH
GPR	GENERATOR PROTECTION RELAY
GND	GROUND
#8G	#8 GROUND WIRE

H

H	HIGH, HUMIDISTAT
HH	HANDHOLE
HMT	HIGH MOTOR TEMPERATURE
HOA	HAND-OFF-AUTO
HOR	HAND-OFF-REMOTE
HP	HORSEPOWER
HS	HAND STATION
HWCO	HIGH WATER CUTOFF
HZ	HERTZ (CYCLE)

I

I/O	INPUT/OUTPUT
I	INSTANTANEOUS
IJB	INTERCOM JUNCTION BOX

J

J,JB	JUNCTION BOX

K

K	KEY INTERLOCK
KAIC	THOUSAND AMPERES INTERRUPTING CURRENT
KCMIL	THOUSAND CIRCULAR MIL
KO	KEY OPERATED
KV	KILOVOLT
KVA	KILOVOLT AMPERE
KVAR	KILOVAR
KW	KILOWATT
KWH	KILOWATT HOUR

L

L	LOW, LEVEL, LONG-TIME
LA	LIGHTNING ARRESTER
LAN	LOCAL AREA NETWORK
LC	LIGHTING CONTRACTOR
LCE	LIGHTING CONTACTOR ENCLOSURE
	LIGHTING CONTROL ENCLOSURE
LCP	LOCAL CONTROL PANEL
LCS	LOCAL CONTROL STATION
LOA	LOCAL-OFF-AUTO
LOR	LOCAL-OFF-REMOTE
LOS	LOCK OUT STOP
LP	LIGHTING PANEL
LS	LIMIT OR LEVEL SWITCH
LTG	LIGHTING
LWCO	LOW WATER CUTOFF

M

M	MAGNETIC MOTOR STARTER
MA	MILLIAMPERE
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MCLU	MOTOR CONTROL LINEUP
MD	MOISTURE DETECTOR, MOTION DETECTOR
MDL	MAGNETIC DOOR LOCK
MFR	MANUFACTURER
MH	MANHOLE, MOUNTING HEIGHT
MOV	MOTOR OPERATED VALVE
MPR	MOTOR PROTECTION RELAY
MS	MANUAL MOTOR STARTER
MSH	MOTOR SPACE HEATER
MTS	MANUAL TRANSFER SWITCH
MV	MILLIVOLT, MEDIUM VOLTAGE
MVA	MEGAVOLT AMPERE

N

N	NEUTRAL
NGR	NEUTRAL GROUNDING RESISTOR
NGT	NEUTRAL GROUNDING TRANSFORMER
NC	NORMALLY CLOSED
NO	NORMALLY OPEN, NUMBER

O

O	OPEN
OL	OVERLOAD
OOA	ON-OFF-AUTO
OOR	ON-OFF-REMOTE
OS	OCCUPANCY SENSOR
O/U	OVER/UNDER

P

P	PRIMARY, POWER, POLE
PCS	PLANT CONTROL SYSTEM
PB	PUSH BUTTON, PULL BOX
PE	PHOTOELECTRIC SENSOR, PHOTOCELL
PF	POWER FACTOR
PFCC	POWER FACTOR CORRECTION CAPACITOR
PH	PHASE
PL	PILOT LIGHT
PLC	PROGRAMMABLE LOGIC CONTROLLER
PP	POWER PANEL
PR	PAIR
PRS	PROXIMITY SWITCH
PS	PRESSURE SWITCH
PT	POTENTIAL TRANSFORMER, PROGRAM TIMER

Q

	NOT USED

R

R	RED, RAISE, RELAY, REVERSE
RECP	RECEPTACLE
RES	RESISTOR
RH	REMOTE HANDSET
RT	REPEATING TIMER
RTD	RESISTANCE TEMPERATURE DETECTOR
RTU	REMOTE TERMINAL UNIT
RVSS	REDUCED VOLTAGE SOLID STATE STARTER

S

S	SHORT-TIME, SHIELDED, STARTER
SA	SURGE ARRESTER, SPEAKER AMPLIFIER
SCADA	SUPERVISORY CONTROL AND DATA ACQUISITION
SF6	SULFUR HEXAFLOURIDE
SH	SPACE HEATER
SN	SOLID NEUTRAL
SO	SOLENOID OILER
SP	SINGLE POLE
SPD	SURGE PROTECTION DEVICE
SPDT	SINGLE POLE DOUBLE THROW
SPST	SINGLE POLE SINGLE THROW
SS	SELECTOR SWITCH, START/STOP, STAINLESS STEEL
SSM	SOLID-STATE METERING
SSS	SOLID STATE STARTER
SST	SOLID-STATE TRIP
SUPV	SUPERVISORY CONTROL
SV	SOLENOID VALVE
SWB,SWBD	SWITCHBOARD
SWG,SWGR	SWITCHGEAR

T

T	THERMOSTAT, TIMER, TOTALIZER, TRANSFORMER
TACH	TACHOMETER
TB	TERMINAL BLOCK
TC	TIMER CLUTCH
TD	TIME DELAY RELAY
TEMP	TEMPERATURE
TM	TIMER MOTOR
TQ	TORQUE
TR	TIMER RELAY, TRIAD
TS	TEMPERATURE SWITCH
TTB	TELEPHONE TERMINAL BOARD

U

UG	UNDERGROUND
UPS	UNINTERRUPTIBLE POWER SUPPLY

V

V	VOLTS, VOLTAGE RESTRAINED
VA	VOLT AMPERE
VAR	VARMETER
VFD	VARIABLE FREQUENCY DRIVE
VI	VACUUM INTERRUPTER
VLS	VALVE LIMIT SWITCH
VM	VOLTMETER
VPI	VALVE POSITION INDICATOR
VS	VOLTMETER SWITCH

W

W	WHITE, WATTS
WH	WATTHOUR METER
WM	WATT METER
WP	WEATHERPROOF
WPI	WEATHERPROOF IN-USE
WS	WALL STATION

X

X	AUXILIARY RELAY
XFMR	TRANSFORMER
XP	EXPLOSION PROOF

Y

Y	YELLOW

Z

Z	AUXILIARY RELAY, IMPEDANCE
ZS	POSITION SWITCH
ZSS	ZERO SPEED SWITCH

1-1PR#16S	ONE, SINGLE PAIR, TWISTED SHIELDED #16 CABLE
3-7/C#14	THREE, SINGLE, SEVEN CONDUCTOR #14 MULTICONDUCTOR CONTROL CABLES

100% SUBMITTAL

F0109222
D4992B3

NO.	BY	CHK	APP	DATE	REVISIONS AND RECORD OF USE
1	AD	PG	IB	02/01/2023	100% SUBMITTAL
				10/10/2022	95% SUBMITTAL
				09/28/2021	ISSUED FOR 60% SUBMITTAL

BLACK & VEATCH

Black & Veatch Corporation
2121 Ponce de Leon Boulevard, Suite 305
Coral Springs, FL 33134
Certificate No. 8132

CITY OF KEY WEST
RICHARD A. HEYMAN
ENVIRONMENTAL PROTECTION FACILITY
RAS AND WAS PUMPS REPLACEMENT

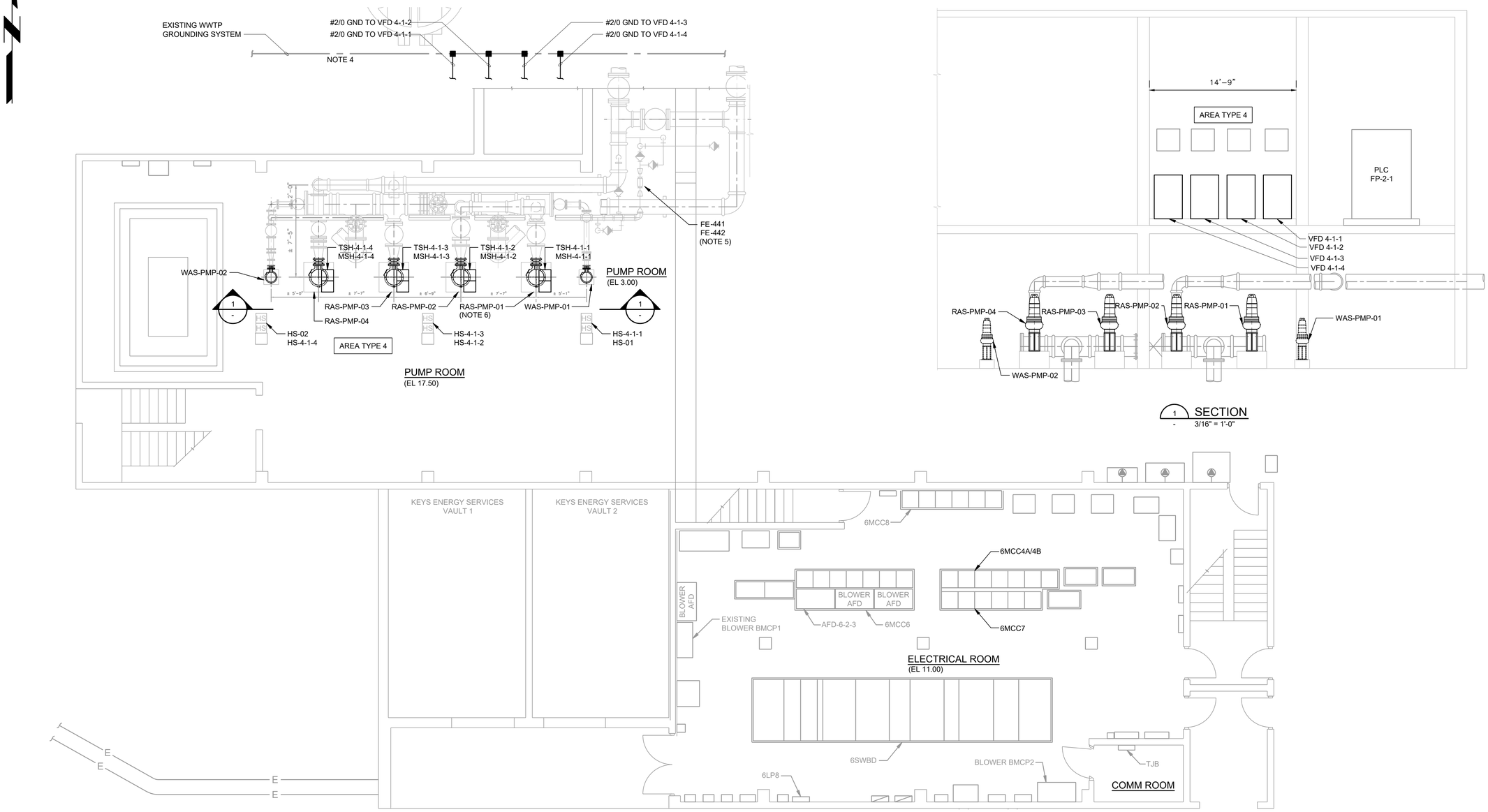
ELECTRICAL
ABBREVIATIONS AND NOTES

DESIGNED: DG
DETAILED: HT, AD
CHECKED: RRB
APPROVED: RRB
DATE: 02/01/2023

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
409283

E-00-002
SHEET
20 OF 27



1 - SECTION
3/16" = 1'-0"

OPERATIONS BUILDING POWER PLAN
3/16" = 1'-0"

NOTES:

1. SEE DRAWINGS E-00-001 AND E-00-002 FOR ELECTRICAL LEGEND AND ABBREVIATIONS AND GENERAL REQUIREMENTS.
2. DRIVES VFD 4-1-1 THROUGH VFD 4-1-4 ARE LOCATED ONE LEVEL ABOVE THE RAS AND WAS PUMPS, REFER TO SECTION VIEW 1. CONTRACTOR SHALL DEMOLISH THE FOUR EXISTING DRIVES ALONG WITH THE DRIVES' TRANSFORMERS, NEW DRIVES SHALL BE LOCATED IN SAME LOCATION AS EXISTING DRIVES.
3. PLC FP-2-1 IS LOCATED ONE LEVEL ABOVE THE RAS AND WAS PUMPS, ADJACENT TO THE VFDS, REFER TO SECTION VIEW 1.
4. CONTRACTOR SHALL UN-EARTH EXISTING GROUNDING SYSTEM BEFORE ADDING NEW EQUIPMENT TO THE GROUNDING SYSTEM.
5. WAS FLOW METERS FIT-441 AND FIT-442 SHALL BE REPLACED AT EXISTING LOCATION.
6. CONTRACTOR SHALL COIL AND STORE ALL PUMP'S POWER CABLE SLACK INSIDE A PULL BOX. THE PULL BOX SHALL BE LOCATED NEAR THE PUMP MOTORS AND SHALL HAVE A NEMA RATING SUITABLE FOR THE LOCATION BEING INSTALLED.

6' 4' 2' 0 5' 10'
3/16"=1'-0"

100% SUBMITTAL

NO.	DATE	REV/ISIONS AND RECORD OF USE	BY	CHK APP
	02/01/2023	100% SUBMITTAL		
	10/10/2022	95% SUBMITTAL		
1	11/26/2021	ISSUED FOR 60% SUBMITTAL	AD	PG IB

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CITY OF KEY WEST
RICHARD A. HEYMAN
ENVIRONMENTAL PROTECTION FACILITY
RAS AND WAS PUMPS REPLACEMENT

ELECTRICAL
OPERATIONS BUILDING POWER PLAN

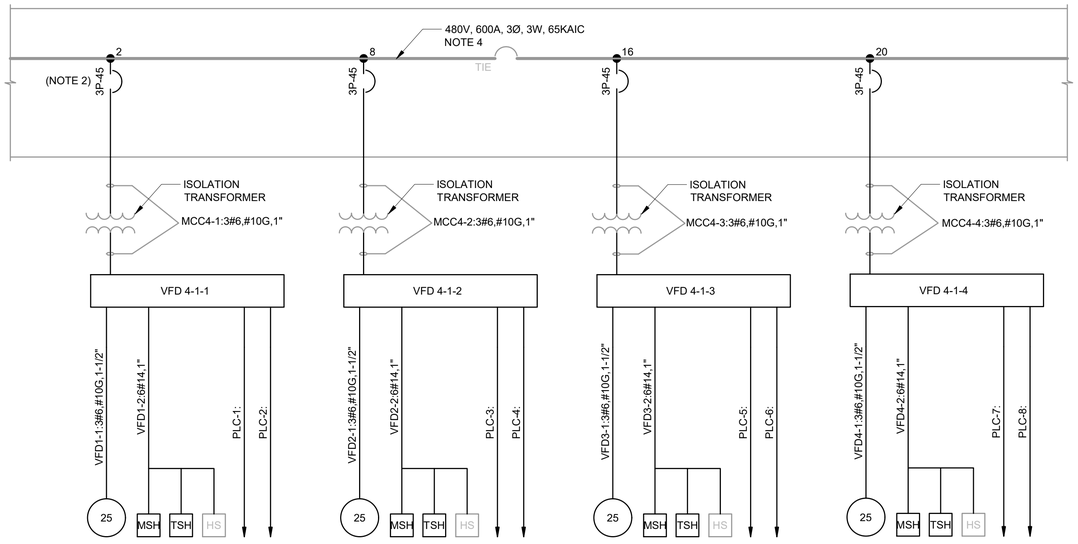
DESIGNED: DG
DETAILED: HT, AD
CHECKED: RRB
APPROVED: RRB
DATE: 02/01/2023

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

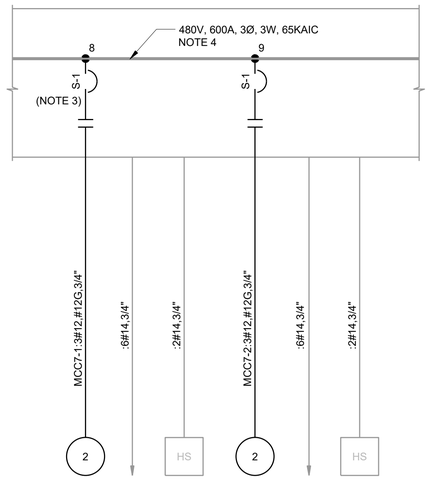
PROJECT NO.
409283

E-10-601
SHEET
21 OF 27

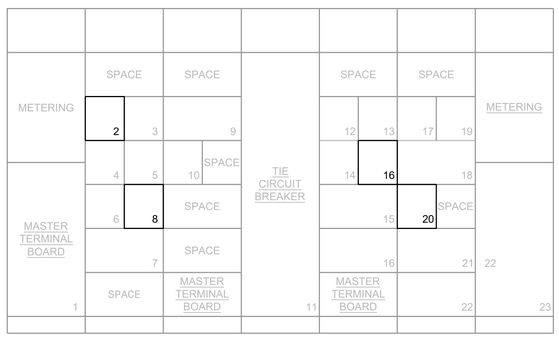
F0160322
D3409283



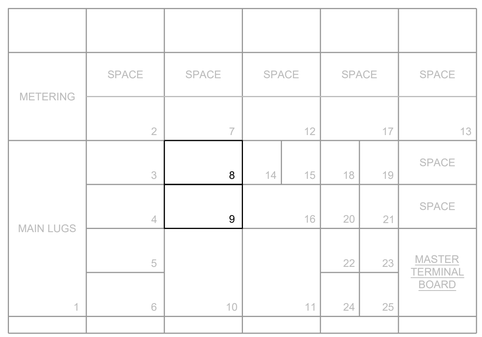
6MCC4A / 4B PARTIAL ONE-LINE DIAGRAM
(ELECTRICAL ROOM)
NO SCALE



6MCC7 PARTIAL ONE-LINE DIAGRAM
(ELECTRICAL ROOM)
NO SCALE



6MCC4A / 4B FRONT ELEVATION
(ELECTRICAL ROOM)
NO SCALE



6MCC7 FRONT ELEVATION
(ELECTRICAL ROOM)
NO SCALE

NOTES:

1. SEE DRAWINGS E-00-001 AND E-00-002 FOR ELECTRICAL LEGEND AND ABBREVIATIONS AND GENERAL REQUIREMENTS.
2. CONTRACTOR SHALL REPLACE BREAKERS IN 6MCC4A / 4B BUCKETS 2, 8, 16 AND 20 AS SHOWN IN THE ONE-LINE DIAGRAM.
3. CONTRACTOR SHALL REPLACE MOTOR STARTERS IN 6MCC7 BUCKETS 8 AND 9 AS SHOWN IN THE ONE-LINE DIAGRAM.
4. EXISTING MOTOR CONTROL CENTERS 6MCC4A/4B AND 6MCC7 ARE WESTINGHOUSE SERIES 2100. NEW BREAKERS AND MOTOR STARTERS SHALL BE COMPATIBLE WITH EXISTING EQUIPMENT.

F0109822
D409283

100% SUBMITTAL

NO.	DATE	REVISIONS AND RECORD OF USE	BY	CHK
1	02/01/2023	100% SUBMITTAL	AD	PG
	10/10/2022	95% SUBMITTAL		
	11/26/2021	ISSUED FOR 60%SUBMITTAL		

APP'D: IB

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CITY OF KEY WEST
RICHARD A. HEYMAN
ENVIRONMENTAL PROTECTION FACILITY
RAS AND WAS PUMPS REPLACEMENT

ELECTRICAL
ONE-LINE DIAGRAMS

DESIGNED: DG
DETAILED: HT, AD
CHECKED: RRB
APPROVED: RRB
DATE: 02/01/2023

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
409283

E-10-602
SHEET
22 OF 27

PUMP ROOM PLC FP-2-1 ONE-LINE DIAGRAM
(PARTIAL)
NO SCALE

NOTES:

1. SEE DRAWINGS E-00-001 AND E-00-002 FOR ELECTRICAL LEGEND AND ABBREVIATIONS AND GENERAL REQUIREMENTS.
2. RECONNECT EXISTING 120VAC SUPPLY TO NEW FLOW METERS.

100% SUBMITTAL

F0109822
D409283

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DATE	REVISIONS AND RECORD OF USE	NO.	BY	CHK APP
02/01/2023	100% SUBMITTAL			
10/10/2022	90% SUBMITTAL			
11/29/2021	ISSUED FOR 60% SUBMITTAL	1	AD	PG IB

CITY OF KEY WEST
RICHARD A. HEYMAN
ENVIRONMENTAL PROTECTION FACILITY
RAS AND WAS PUMPS REPLACEMENT

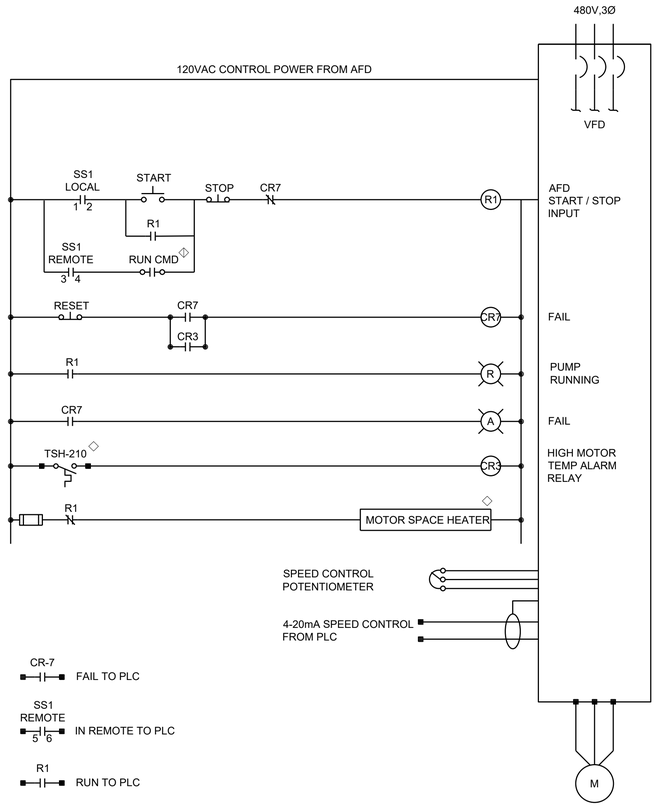
ELECTRICAL
PLC ONE-LINE DIAGRAM

DESIGNED: DG
DETAILED: HT, AD
CHECKED: RRB
APPROVED: RRB
DATE: 02/01/2023

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

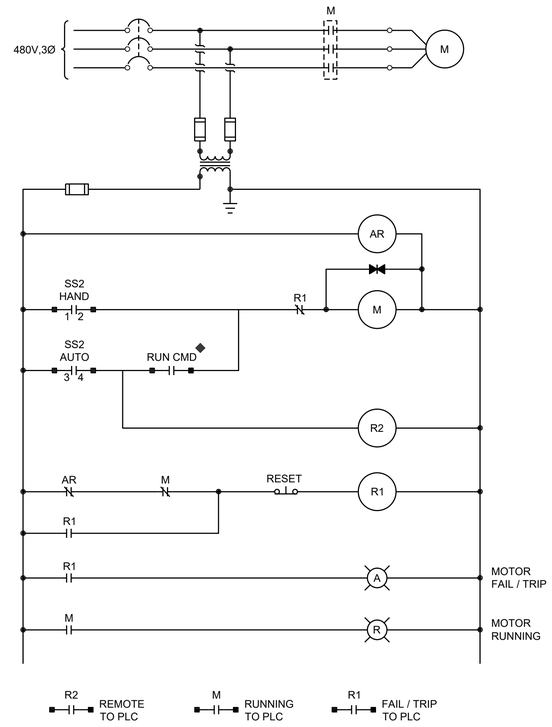
PROJECT NO.
409283

E-10-603
SHEET
23 OF 27



VFD 4-1-1

SIMILAR FOR VFD 4-1-2, VFD 4-1-3, AND VFD 4-1-4



WAS-PMP-01

SIMILAR FOR WAS-PMP-02

SWITCH DEVELOPMENTS:

SS1

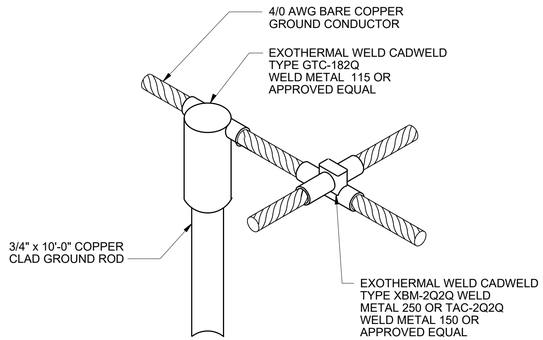
CONTACTS	POSITION		
	LOCAL	OFF	REMOTE
1 - 2	X		
3 - 4			X
5 - 6			X

SS2

CONTACTS	POSITION		
	LOCAL	OFF	REMOTE
1 - 2	X		
3 - 4			X
5 - 6			X

SYMBOL LEGEND:

- ◇ AT OR NEAR DRIVEN EQUIPMENT
- ◆ REMOTE FROM STARTER
- ◇ AT PLC



EXOTHERMAL WELD

C GROUND ROD AT CROSS OR TEE CONNECTION

\- NO SCALE

NOTES:

1. SEE DRAWINGS E-00-001 AND E-00-002 FOR ELECTRICAL LEGEND AND ABBREVIATIONS AND GENERAL REQUIREMENTS.
2. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING COMMUNICATION AND CONTROL WIRING BETWEEN THE EXISTING PLC FP-2-1 AND THE FOUR RAS PUMPS VFDS. THE CONFIGURATION AND FUNCTIONS OF THE NEW DRIVES SHOULD MATCH THAT OF THE EXISTING DRIVES. EXISTING VFDS ARE ALLEN-BRADLEY MODEL 1336 PLUS II. CONTRACTOR SHALL COORDINATE WITH OWNER AND THE DRIVES' MANUFACTURER TO FINISH THE DEVELOPMENT OF THE VFD SCHEMATIC TO MATCH THE EXISTING DRIVES.

F01109222
D4192A3

NO.	DATE	REVISIONS AND RECORD OF USE	BY	CHK
1	11/29/2021	ISSUED FOR 60% SUBMITTAL	AD	PG
	10/10/2022	90% SUBMITTAL		
	02/01/2023	100% SUBMITTAL		

APP: IB

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Certificate No. 8132

CITY OF KEY WEST
RICHARD A. HEYMAN
ENVIRONMENTAL PROTECTION FACILITY
RAS AND WAS PUMPS REPLACEMENT

ELECTRICAL
SCEHMATICS AND DETAILS

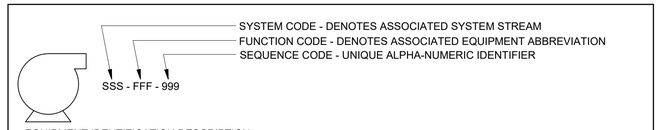
DESIGNED: DG
DETAILED: HT, AD
CHECKED: RRB
APPROVED: RRB
DATE: 02/01/2023

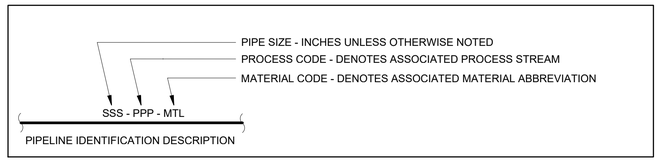
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
409283

E-10-701
SHEET
24 OF 27

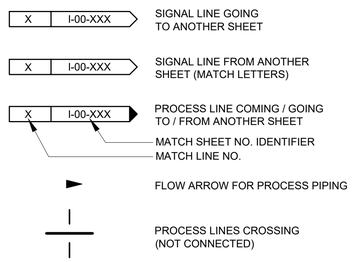
100% SUBMITTAL





LINE SYMBOLS

- MAJOR PROCESS PIPING OR FLOW CHANNEL
- SECONDARY PROCESS PIPING
- MISCELLANEOUS PIPING
- SCREENED LINE DENOTES EXISTING PIPE OR EQUIPMENT
- DASHED LINE DENOTES FUTURE PIPE AND EQUIPMENT
- ELECTRIC SIGNAL



PRIMARY ELEMENT & FITTING SYMBOLS

- PRIMARY FLOW ELEMENT: ELECTROMAGNETIC
- ANNULAR TYPE DIAPHRAGM SEAL
- REDUCER - CONCENTRIC
- REDUCER - ECCENTRIC

PUMP & BLOWER SYMBOLS

- CENTRIFUGAL PUMP OR OTHER TYPE NOT SPECIFIED
- ELECTRIC MOTOR

PIPELINE MATERIAL CODE ABBREVIATIONS

GLDIP	SECTION 15061, DUCTILE IRON PIPE

VALVE & GATE SYMBOLS

- VALVE: GATE OR OTHER TWO-WAY TYPE NOT OTHERWISE IDENTIFIED
- VALVE: BALL
- VALVE: BUTTERFLY
- VALVE: ECCENTRIC PLUG
- VALVE: CHECK
- VALVE: AIR RELEASE

INSTRUMENT AND I/O ABBREVIATION DEFINITIONS

FA	FAIL ALARM
FI	FLOW INDICATOR
FE	PRIMARY FLOW ELEMENT / SENSOR
FIT	FLOW INDICATING TRANSMITTER
GA	GENERAL ALARM
HS	HAND SWITCH
PE	PRESSURE SENSOR
PI	PRESSURE INDICATOR
PIT	PRESSURE INDICATING TRANSMITTER
RES	RESET
SI	SPEED INDICATION
SK	SPEED COMMAND
TAH	TEMPERATURE ALARM HIGH
TSH	TEMPERATURE SWITCH HIGH
UA	MULTI-VARIABLE / COMMON ALARM / COMMON FAULT
UCR	RUN COMMAND
UCS	STOP COMMAND
YA	GENERAL ALARM EVENT
YI	EVENT INDICATION

FUNCTION DESIGNATIONS AND ABBREVIATIONS

HAND SWITCH DESIGNATIONS

HOA	HAND-OFF-AUTO
HOR	HAND-OFF-REMOTE
OOA	ON-OFF-AUTO
OO	ON-OFF
OO/R	ON-OFF/RESET
SS	START-STOP
AM	AUTO-MANUAL

POWER SUPPLY ABBREVIATIONS

24VDC	24 VOLT DC SUPPLY
120VAC	120 VOLT AC SUPPLY
480VAC	480 VOLT AC SUPPLY

120V — POWER SUPPLY SOURCE LABEL. USED ONLY WHERE NECESSARY TO HELP CLARIFY AN INSTRUMENT OR SYSTEM FUNCTION.

SYSTEM CODE ABBREVIATIONS

CL2	CHLORINE
RAS	RETURN ACTIVATED SLUDGE
WAS	WASTE ACTIVATED SLUDGE

PROCESS CODE ABBREVIATIONS

CL2	CHLORINE
RAS	RETURN ACTIVATED SLUDGE
WAS	WASTE ACTIVATED SLUDGE

FUNCTION CODE ABBREVIATIONS

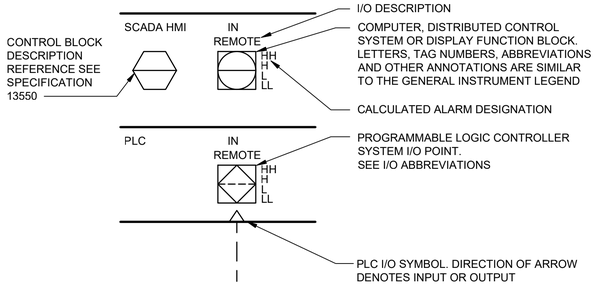
AVR	VALVE, AIR RELEASE
BFV	AWWA BUTTERFLY VALVE
BV	AWWA BALL VALVE
EPV	VALVE, ECCENTRIC PLUG
GV	GATE VALVE
M	MOTOR
PCL	PUMP, CENTRIFUGAL
PLC	PROGRAMMABLE LOGIC CONTROLLER
PV	NON-ECCENTRIC PLUG VALVE
VC	CHECK VALVE
TVC	TILTING DISK CHECK VALVE

GENERAL INSTRUMENT SYMBOLS

- FIELD MOUNTED DISCRETE INSTRUMENT
- PILOT LIGHT
- DISCRETE INSTRUMENT MOUNTED ON FACE PRIMARY OF PANEL
- DISCRETE INSTRUMENT MOUNTED BEHIND OR INSIDE OF PRIMARY PANEL
- DISCRETE INSTRUMENT MOUNTED ON FACE OF LOCAL PANEL
- DISCRETE INSTRUMENT MOUNTED BEHIND OR INSIDE OF LOCAL PANEL
- SINGLE INSTRUMENT HOUSING CONTAINING TWO (OR MORE) INSTRUMENTATION FUNCTIONS
- I — GENERAL CONTROL INTERLOCK FUNCTION, SEE SCHEMATICS AND SYSTEM SPECIFICATIONS FOR SPECIFIC FUNCTION

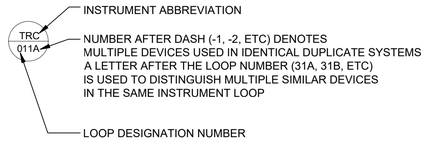
DIGITAL SYSTEMS INTERFACE SYMBOLS

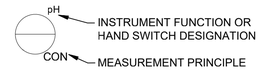
NOTE : REFER TO DETAILED SYSTEM SPECIFICATIONS FOR FUNCTIONAL DESCRIPTION. ALSO SEE I/O SCHEDULES FOR COMPLETE INPUT AND OUTPUT LISTINGS.



- DISCRETE INPUT
- DISCRETE OUTPUT
- ANALOG INPUT
- ANALOG OUTPUT
- PULSE INPUT

INSTRUMENTATION SYMBOLOGY AND DESIGNATIONS





GENERAL NOTES

1. IN GENERAL, THE P&ID SYMBOLS AND DEVICE IDENTIFICATIONS ARE BASED ON INTERNATIONAL SOCIETY OF AUTOMATION, STANDARD PRACTICE ANSI/ISA-5.1 (2009). SOME MODIFICATIONS, ADDITIONS AND ALTERATIONS HAVE BEEN MADE AS NEEDED TO ACCOMMODATE THE PROJECT REQUIREMENTS.
2. SOME CONTROL AND INTERLOCK REQUIREMENTS WHICH CAN BE MORE CLEARLY ILLUSTRATED ON SCHEMATIC DRAWINGS HAVE BEEN OMITTED FROM THE P&ID DRAWINGS.
3. THIS IS A GENERAL LEGEND SHEET. SOME SYMBOLS AND ABBREVIATIONS MAY NOT BE UTILIZED ON THIS SPECIFIC PROJECT.
4. PIPING AND EQUIPMENT LEGEND APPLIES TO P&ID SHEETS ONLY AND MAY DIFFER FROM LEGENDS FOR OTHER SHEETS.

100% SUBMITTAL

NO.	BY	CHK	APP	DATE	REVISIONS AND RECORD OF USE
				02/01/2023	100% SUBMITTAL
2	AD	PG	IB	10/10/2022	ISSUED FOR 90% SUBMITTAL
1	AD	PG	IB	09/28/2021	ISSUED FOR 60% SUBMITTAL

Date:
Engineer of Record:
Florida License No.:

BLACK & VEATCH
Black & Veatch Corporation
2121 Ponce de Leon Boulevard, Suite 305
Coral Springs, FL 33134
Certificate No. 8132

CITY OF KEY WEST
RICHARD A. HEYMAN
ENVIRONMENTAL PROTECTION FACILITY
RAS AND WAS PUMPS REPLACEMENT

P&ID
LEGEND AND ABBREVIATIONS

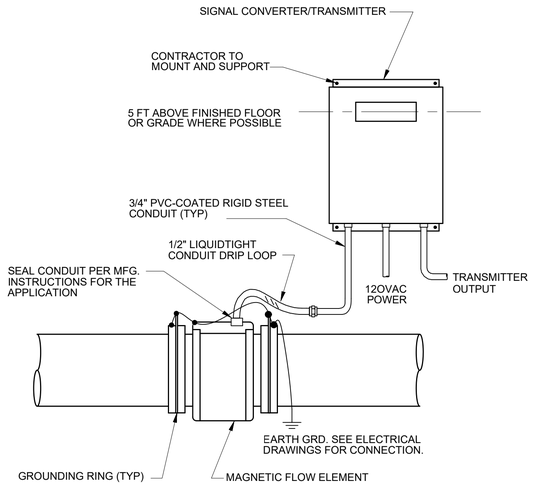
DESIGNED: LB
DETAILED: AD
CHECKED: PG
APPROVED: IB
DATE: 02/01/2023

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
409283

I-00-001
SHEET
25 OF 28

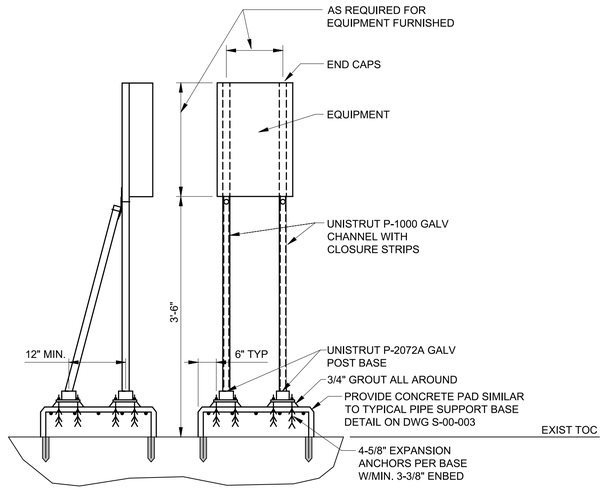
F0190622
D409283



A MAGNETIC FLOWMETER

NO SCALE

NOTES:
1. PIPE TO BE SUPPORTED ON BOTH SIDES OF METER.



B TYPICAL EQUIPMENT MOUNTING

NO SCALE

100% SUBMITTAL

NO.	BY	CHK	APP	DATE	REVISIONS AND RECORD OF USE
				02/01/2023	100% SUBMITTAL

Date:
Engineer of Record:
Florida License No.:

BLACK & VEATCH
Black & Veatch Corporation
2121 Ponce de Leon Boulevard, Suite 305
Coral Springs, FL 33134
Certificate No. 8132

CITY OF KEY WEST
RICHARD A. HEYMAN
ENVIRONMENTAL PROTECTION FACILITY
RAS AND WAS PUMPS REPLACEMENT

P&ID
INSTRUMENT INSTALLATION DETAILS

DESIGNED: DH
DETAILED: DH
CHECKED: PG
APPROVED: IB
DATE: 02/01/2023

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
409283

I-00-501
SHEET
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F0106522
D409283

SCADA HMI

PLC FPP-2-1

FAIL	RUNNING	RUN CMD	SPEED SETPOINT
UA 414	YIR 414	UCR 414	SK 414
UA 413	YIR 413	UCR 413	SK 413
UA 412	YIR 412	UCR 412	SK 412
UA 411	YIR 411	UCR 411	SK 411

FLOW
FI

	HOA	OO		
VFD 414	HS 414	HS 414	HK 414	480VAC
VFD 413	HS 413	HS 413	HK 413	480VAC
VFD 412	HS 412	HS 412	HK 412	480VAC
VFD 411	HS 411	HS 411	HK 411	480VAC

A I-10-602 TO WAS-PMP-02 SUCTION

I-10-602 A FROM WAS-PMP-02

6"-WAS-GLDIP

WAS-EPV-09

FROM CLARIFIER — 18"-RAS-GLDIP — RAS-KGV-02 — RAS-EPV-06 — 14"-RAS-GLDIP — 14" x 8" RAS-PMP-04 — 8" x 12" — TSH 414 — HS 414 OO — PI 414 — RAS-TVC-04 — RAS-EPV-01 — 12"-RAS-GLDIP — 18" x 12" x 12" TEE — 18"-RAS-GLDIP — RAS-EPV-10

6"-RAS-GLDIP — WAS-EPV-10

FIT 120V — FE — M — RAS — TO AERATION BASIN

24"-RAS-GLDIP

RAS-KGV-03

14"-RAS-GLDIP — RAS-EPV-02 — 14" x 8" RAS-PMP-03 — 8" x 12" — TSH 413 — HS 413 OO — PI 413 — RAS-TVC-03 — RAS-EPV-08 — 12"-RAS-GLDIP

RAS-EPV-09 — 18"-RAS-GLDIP

14"-RAS-GLDIP — RAS-EPV-05 — 14" x 8" RAS-PMP-02 — 8" x 12" — TSH 412 — HS 412 OO — PI 412 — RAS-TVC-02 — RAS-EPV-03 — 12"-RAS-GLDIP — 18" x 12" x 12" TEE — 18"-RAS-GLDIP

FIT 120V — FE — M — RAS — TO AERATION BASIN — RAS-EPV-11

24"-RAS-GLDIP

12"-RAS-GLDIP — WAS-EPV-05

I-10-602 B FROM WAS-PMP-01

FROM CLARIFIER — 18"-RAS-GLDIP — RAS-KGV-01 — RAS-EPV-04 — 14"-RAS-GLDIP — 14" x 8" RAS-PMP-01 — TSH 411 — HS 411 OO — PI 411 — RAS-TVC-01 — RAS-EPV-07

WAS-EPV-02

6"-WAS-GLDIP

B I-10-602 TO WAS-PMP-02 SUCTION

NOTES:

1. SEE LEGEND AND ABBREVIATIONS ON DRAWINGS I-00-001.
2. SYSTEM CODE IS RAS UNLESS OTHERWISE NOTED.

100 % SUBMITTAL

NO.	BY	CHK	APP	DATE	REVISIONS AND RECORD OF USE
2	AD	PG	IB	02/01/2023	100% SUBMITTAL
1	AD	PG	IB	10/10/2022	ISSUED FOR 60% SUBMITTAL
				09/28/2021	ISSUED FOR 30% SUBMITTAL

Date:
Engineer of Record:
Florida License No.:

BLACK & VEATCH
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Coral Springs, FL 33134
Certificate No. 8132

CITY OF KEY WEST
RICHARD A. HEYMAN
ENVIRONMENTAL PROTECTION FACILITY
RAS AND WAS PUMPS REPLACEMENT

P&ID
RAS PUMPING STATION

DESIGNED: LB
DETAILED: AD
CHECKED: PG
APPROVED: IB
DATE: 02/01/2023

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
409283

I-10-601
SHEET
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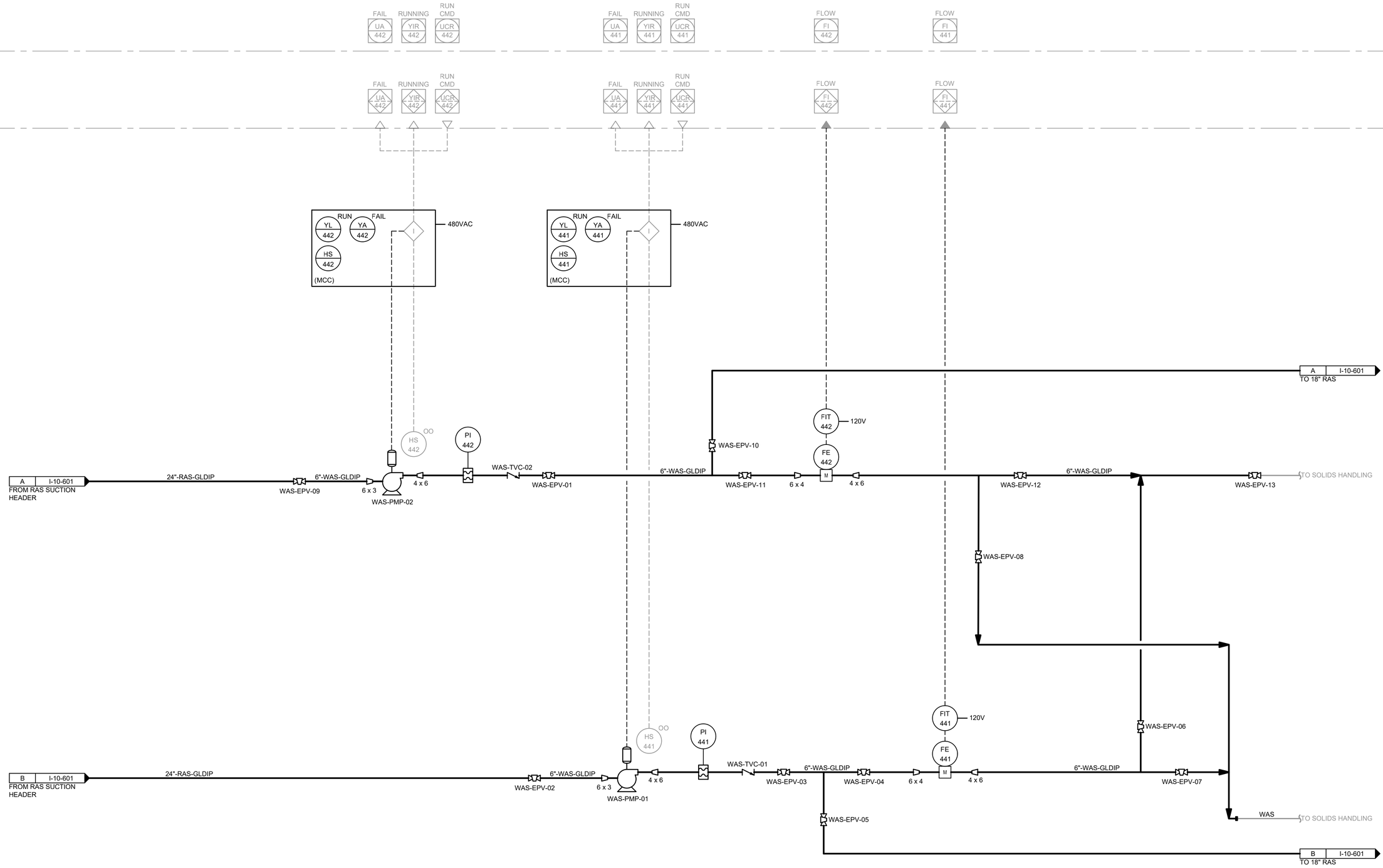
F0106622
D409283



NOTES:

1. SEE LEGEND AND ABBREVIATIONS ON DRAWINGS I-00-001.
2. SYSTEM CODE IS WAS UNLESS OTHERWISE NOTED.

100% SUBMITTAL

NO.	BY	CHK	APP	DATE	REVISIONS AND RECORD OF USE
				02/01/2023	100% SUBMITTAL
2	AD	PG	IB	10/10/2022	ISSUED FOR 90% SUBMITTAL
1	AD	PG	IB	09/28/2021	ISSUED FOR 60% SUBMITTAL

Date:
Engineer of Record:
Florida License No.:

BLACK & VEATCH

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Coral Springs, FL 33134
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CITY OF KEY WEST
RICHARD A. HEYMAN
ENVIRONMENTAL PROTECTION FACILITY
RAS AND WAS PUMPS REPLACEMENT

P&ID
WAS PUMPING STATION

DESIGNED:	LB
DETAILED:	AD
CHECKED:	PG
APPROVED:	IB
DATE:	02/01/2023

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
409283

I-10-602
SHEET
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D409283