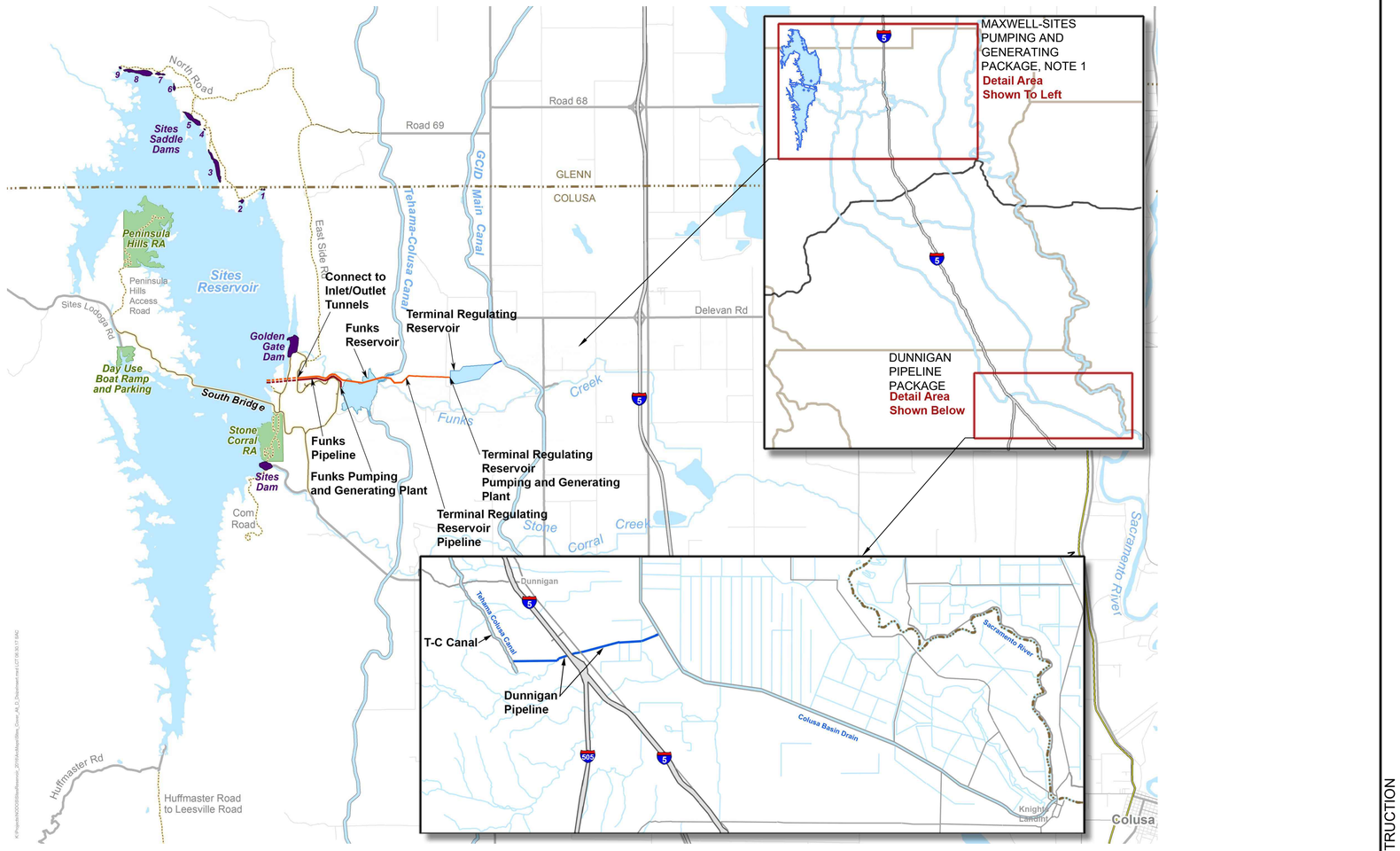
SITES RESERVOIR
DUNNIGAN PIPELINE PROJECT
PIPELINE AND FACILITIES
30% DESIGN - CLIENT REVIEW
FEBRUARY 5, 2024

PROJECT LOCATION MAP



OVERALL PROJECT SITE MAP

NOTE 1: MAXWELL-SITES PUMPING AND GENERATING PACKAGE(S) NOT INCLUDED IN THIS PACKAGE

REV	DATE	BY	CHK.	APPR.	DESCRIPTION

DESIGNED BY: D. CAVE
DRAWN BY: D. CAVE
CHECKED BY: B. MEMEO
IN CHARGE: P. RUDE
DATE: 02-02-2024

Jacobs
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REGISTERED PROFESSIONAL ENGINEER
BRAD L. MEMEO
C81778
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Sites

SITES RESERVOIR
DUNNIGAN PIPELINE
GENERAL
COVER SHEET,
LOCATION MAP AND SITE MAP

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

DRAWING NO.
DNP-0001-G-0001
SHT 1 OF 55

PRELIMINARY - NOT FOR CONSTRUCTION

Plot Date: 1/30/2024 1:55 PM
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File: C:\pwworking\hdr_sites_reservoir\dms01259\DNP-0001-G-0001.dwg

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1	DNP-0001-G-0001	COVER SHEET, LOCATION MAP AND SITE MAP
2	DNP-0001-G-0002	INDEX OF DRAWINGS
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4	DNP-0001-G-0020	GENERAL SYMBOLS AND DRAWING NUMBERING LEGEND
5	DNP-0001-G-0101	CIVIL LEGEND
6	DNP-0001-G-0301	STRUCTURAL NOTES 1
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8	DNP-0001-G-0401	PROCESS MECHANICAL LEGEND AND NOTES
9	DNP-0001-G-0501	HVAC LEGEND
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19	DNP-5020-P-2000	KEY PLAN, CONTROL AND HORIZONTAL ALIGNMENT DATA, AND SITE ACCESS
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22	DNP-5020-P-2003	PIPELINE PLAN AND PROFILE STA 60+00 TO 85+00
23	DNP-5020-P-2004	PIPELINE PLAN AND PROFILE STA 85+00 TO 110+00
24	DNP-5020-P-2005	PIPELINE PLAN AND PROFILE STA 110+00 TO 135+00
25	DNP-5020-P-2006	PIPELINE PLAN AND PROFILE STA 135+00 TO 160+00
26	DNP-5020-P-2007	PIPELINE PLAN AND PROFILE STA 160+00 TO 185+00
27	DNP-5020-P-2008	PIPELINE PLAN AND PROFILE STA 185+00 TO 205+00
28	DNP-5020-P-2009	PIPELINE PLAN AND PROFILE STA 205+00 TO 209+83.49
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32	DNP-5100-S-2101	T-C CANAL INLET STRUCTURE GROUND LEVEL PLAN
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53	DNP-5900-C-5003	STANDARD DETAILS
54	DNP-5900-C-5004	STANDARD DETAILS
55	DNP-5900-C-5005	STANDARD DETAILS

Plot Date: 2/6/2024 2:01 PM
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DNP-0001-G-0002
SHT 2 OF 55

PRELIMINARY - NOT FOR CONSTRUCTION

@	AT
L	ANGLE
A/C	AIR CONDITIONING
A/C UNIT	AIR CONDITIONING UNIT
AB	ANCHOR BOLT, AGGREGATE BASE
ABUT	ABUTMENT
ABV	ABOVE
AC	ALTERNATING CURRENT,
	ASPHALT CONCRETE BASE
ACC	ACCESSIBLE
ACI	AMERICAN CONCRETE INSTITUTE
ACR	ACRYLIC PLASTIC
ACS DR	ACCESS DOOR
ACS PNL	ACCESS PANEL
ACSR	ALUMINUM CABLE STEEL REINFORCED
ACST	ACOUSTIC
ACT	ACOUSTICAL CEILING TILE
ADDM	ADDENDUM
ADH	ADHESIVE
ADJ	ADJACENT, ADJOINING, ADJUSTABLE, ADJUST
ADO	AUTOMATIC DOOR OPERATOR
AFF	ABOVE FINISHED FLOOR
AGGR	AGGREGATE
AHR	ANCHOR
AHU	AIR HANDLING UNIT
AI	AREA INLET
AIC	AMPERE INTERRUPTING CAPACITY
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION
A.L.	ACTIVE LEAF
ALT	ALTERNATE
ALUM	ALUMINUM
AMB	AMBIENT
AMP	AMPERE
ANOD	ANODIZE
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
APPD	APPROVED
APPROX	APPROXIMATE
ARCH	ARCHITECT
ARFCD	AMERICAN RIVER FLOOD CONTROL DISTRICT
ARI	AMERICAN REFRIGERATION INSTITUTE
ARN	ARCADE CREEK NORTH
ARS	ARCADE CREEK SOUTH
ARV	AIR RELEASE VALVE
ASB	ASBESTOS
ASC	ABOVE SUSPENDED CEILING
ASPH	ASPHALT
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
ATC	ACOUSTICAL TILE CEILING
AUTO	AUTOMATIC
AVE	AVENUE
AVG	AVERAGE
AWG	AMERICAN WIRE GAUGE
AWT	ACOUSTICAL WALL TREATMENT
BB	BEGINNING OF BRIDGE, BULLETIN BOARD
B-B	BACK-TO-BACK
BC	BEGIN HORIZONTAL CURVE, BOOKCASE
BD	BOARD
BDRY	BOUNDARY
BEG	BEGIN
BEJ	BRICK EXPANSION JOINT
BEV	BEVEL
BFV	BUTTERFLY VALVE
BITUM	BITUMINOUS
BJT	BED JOINT
BK	BACK
BKF	BACKFILL
BL	BUILDING LINE
BLDG	BUILDING
BLKT	BLANKET
BLVD	BOULEVARD
BLW	BELOW
BM	BENCHMARK
BMP	BEST MANAGEMENT PRACTICE
BO	BOTTOM OF
BOT	BOTTOM
BP	BEGINNING POINT, BACK PLASTER(ED)
BR	BRIDGE
BRCG	BRACING
BRDG	BRIDGING
BRG	BEARING
BRG PL	BEARING PLATE
BRK	BRICK
BRKT	BRACKET
BRZ	BRONZE
BS	BOTH SIDES
BSMT	BASEMENT
Btu	BRITISH THERMAL UNIT
BtuH	BTU PER HOUR
BTWN	BETWEEN
BV	BALL VALVE
BUR	BUILT-UP ROOFING
BVC	BEGIN VERTICAL CURVE
BW	BOTH WAYS, BARBED WIRE
CAB	CABINET
CAP	CAPACITY
CARV	COMBINATION AIR RELEASE VALVE
CB	CATCH BASIN, CEMENT BENTONITE
CBD	COLUSA BASIN DRAIN
C-C	CENTER-TO-CENTER
CCS	CALIFORNIA COORDINATE SYSTEM
CCT	CUBICLE CURTAIN TRACK
CCTV	CLOSED CIRCUIT TELEVISION
CE	COVER ELEVATION
CEM	CEMENT
CEM PLAS	CEMENT PLASTER
CER	CERAMIC
CFDM	COFFER DAM
CFI	CONDUCTIVE FLOORING
CFLG	COUNTERFLASHING
CFM	CUBIC FEET PER MINUTE
CFS	CUBIC FEET PER SECOND
CG	CORNER GUARD
CH BD	CHALKBOARD
CHFR	CHAMFER
CHIM	CHIMNEY
CHK	CHECK
CHNL	CHANNEL
CHR PL	CHROME PLATED
CI	CAST IRON, CURB INLET
CIP	CAST-IN-PLACE
CIRC	CIRCULAR
CJ	CONTROL JOINT
CJ	CONSTRUCTION JOINT
CKT	CIRCUIT
CKT BRKR	CIRCUIT BREAKER
CL	CONTROL LINE
	CENTER LINE
CL-6	CHAIN LINK FENCE (6 FT)
CLG	CEILING
CLG HT	CEILING HEIGHT
CLGL	CLEAR GLASS
CLL	CONTRACT LIMIT LINE
CLO	CLOSET
CLOS	CLOSURE
CLR	CLEAR, CLEARANCE
CLS	CLASS
CLSM	CONTROLLED LOW STRENGTH MATERIAL
CLWG	CLEAR WIRED GLASS
cm	CENTIMETER(S)
CM	CORRUGATED METAL
CMP	CORRUGATED METAL PIPE
CMPST	COMPOSITE
CMU	CONCRETE MASONRY UNIT
CND	CONDUIT
CNL	CONDUCTIVE NEOPRENE LATEX
CNR	CORNER
CNTR	COUNTER
CO	COUNTY, CLEANOUT
CO2	CARBON DIOXIDE
COL	COLUMN
COM	COMMON
COMB	COMBINED, COMBUSTION
COMPT	COMPARTMENT
CONC	CONCRETE
COND	CONDUIT
CONN	CONNECT
CONSTR	CONSTRUCTION
CONT	CONTINUE
CONTR	CONTRACTOR
CONV	CONVENTIONAL
COORD	COORDINATE
CORR	CORRIDOR
COV	COVER
CPRS	COMPRESSIBLE
CP	CATCH POINT
CPT	CONE PENETRATION TEXT, CARPET
CR	CREEK
CRCMF	CIRCUMFERENCE
CRES	CORROSIVE RESISTANT STEEL
CRG	CROSS GRAIN
CRS	COURSE(S)
CS	CAST STONE
CSK	COUNTERSUNK
CSMT	CASEMENT
CT	COURT, CERAMIC TILE,
	CURRENT TRANSFORMER
C TO C	CENTER TO CENTER
CTR	CENTER
CU	CONDENSING UNIT
Cu	COPPER
CU FT	CUBIC FEET
CUH	CABINET UNIT HEATER
CU YD	CUBIC YARDS
CUFPB	CENTRAL VALLEY FLOOD PROTECTION BOARD
CULV	CULVERT
CV	CEILING VENT
CVH	CONDUCTIVE VINYL HOMOGENEOUS
	(SHEET TYPE)
CVHS	CENTRAL VALLEY HYDROLOGY STUDY
CW	COLD WATER
CYL	CYLINDER
D	DEPTH
d	PENNY (AS IN NAIL - 10D)
D.O.T.	DEPARTMENT OF TRANSPORTATION
DAT	DATUM
DB	DRY BULB
DBL	DOUBLE
DBL ACT DR	DOUBLE ACTING DOOR
DCJ	DOWELED CONTROL JOINT
DCJT	DUMMY CONTROL JOINT
DEG	DEGREE
DEMO	DEMOLITION
DEPR	DEPRESSION
DEPT	DEPARTMENT
DET	DETAIL
DF	DRINKING FOUNTAIN
DH	DOUBLE HUNG
DH	DUCT HEATER
DI	DRAINAGE INLET, DROP INLET
DIA, Ø	DIAMETER
DIAG	DIAGONAL
DIM	DIMENSION
DIP	DUCTILE IRON PIPE
DISC	DISCONNECT
DISP	DISPENSER
DIST	DISTANCE
DISTR PNL	DISTRIBUTION PANEL
DIV	DIVISION
DL	DEAD LOAD
DMPF	DAMPPROOFING
DMPR	DAMPER
DMT	DEMOUNTABLE
DN	DOWN
DNP	DUNNIGAN PIPELINE
DR	DOOR, DRAIN, DRIVE
DRB	DRAINBOARD
DR CL	DOOR CLOSER
DS	DOWNSTREAM, DOWNSPOUT,
	DOUBLE STRENGTH (GLASS)
DSM	DEEP SOIL MIX
DTL	DETAIL
DT	DRAIN TILE
DVTL	DOVETAIL
DWG	DRAWING
DWLS	DOWELS
DWR	DEPARTMENT OF WATER RESOURCES, DRAWER
DX	DIRECT EXPANSION
DWY	DRIVEWAY
E	EAST, EASTING
EA	EACH, EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
EB	END OF BRIDGE
EC	END HORIZONTAL CURVE
ECR	END CURB RETURN
EF, E.F.	EACH FACE
EG	EXISTING GRADE
EJ	EXPANSION JOINT
EL	ELEVATION - GRADE OR BUILDING
ELECT	ELECTRIC
ELEV, EL	ELEVATION
ELV	ELECTRIC VAULT
EM	EXPANDED METAL
EMB	EMBANKMENT
EMD	ESTIMATED MAXIMUM DEMAND
EMER	EMERGENCY
ENCL	ENCLOSE(URE)
ENGR	ENGINEER
ENTR	ENTRANCE, ENTERING
EOD	EDGE OF DECK
EP	END POINT, ELECTRICAL PANELBOARD
EPRF	EXPLOSION PROOF
EPY	EPOXY COATING
ESA	ENVIRONMENTALLY SENSITIVE AREA
EQ	EQUAL
EQUIP	EQUIPMENT
ESCAL	ESCALATOR
EST	ESTIMATE(D)
EVC	END VERTICAL CURVE
E.W.	EACH WAY
EWC	ELECTRIC WATER COOLER
EWT	ENTERING WATER TEMPERATURE
EXC	EXCAVATE, EXCAVATION
EXH	EXHAUST
EXH A	EXHAUST AIR
EXST, (E)	EXISTING
EXP	EXPANSION
EXP	EXPOSED
EXP BT	EXPANSION BOLT
EXT	EXTERIOR
F	FAHRENHEIT
FA	FIRE ALARM
FA	FRESH AIR
FAC	FIRE APPARATUS CLOSET
FAI	FRESH AIR INTAKE
F BRK	FIRE BRICK
FC	FOOT CANDLE
FC BRK	FACE BRICK
FCG	FACING
FCJ	FLOOR CONSTRUCTION JOINT
FCO	FLOOR CLEANOUT
FCU	FAN COIL UNIT
FD	FLOOR DRAIN
FDMPR	FIRE DAMPER
FDTN	FOUNDATION
FE	FIRE EXTINGUISHER
FEB	FIRE EXTINGUISHER BRACKET
FEC	FIRE EXTINGUISHER CABINET
FF	FACTORY FINISH
FF EL	FINISH FLOOR ELEAVATION
FG	FINISHED GRADE
FGL	FIBERGLASS
FH	FIRE HYDRANT
FH	FLAT HEAD
FHC	FIRE HOSE CABINET
FHMS	FLAT HEAD MACHINE SCREW
FHR	FIRE HOSE RACK
FHS	FIRE HOSE STATION
FHWS	FLAT HEAD WOOD SCREW
FIG	FIGURE
FIN	FINISH
FIN FLR	FINISH FLOOR
FIXT	FIXTURE
FJT	FLUSH JOINT
FL	FLOW LINE
FLASH	FLASHING
FLR	FLOOR
FLEX	FLEXIBLE
FLG	FLOORING
FLR PL	FLOOR PLATE
FLUOR	FLUORESCENT
FN	FENCE
FNK	FUNKS
FO	FIBER OPTIC
FOC	FACE OF CONCRETE
FOF	FACE OF FINISH
FOM	FACE OF MASONRY
FOS	FACE OF STUD
FP	FIRE PROTECTION /
	FIREPROOF / FIRE PARTITION
FPM	FEET PER MINUTE
FR	FIRE RESISTANT / FRAME
FRG	FORGED
FRMG	FRAMING
FRT	FIRE-RETARDANT
FS	FULL SIZE
FSTNR	FASTEN(ER)
FT	FEET, FOOT
FTG	FOOTING
FURG	FURRING
FUT	FUTURE
FW	FIRE WATER
FWC	FABRIC WALL COVERING
G	NATURAL GAS
GA	GAGE
GAL	GALLON(S)
GALV	GALVANIZED
GALV STL	GALVANIZED STEEL
GB	GRADE BREAK, GRAB BAR
GC	GENERAL CONTRACTOR
GCID	GLENN-COLUSA IRRIGATION DISTRICT
GEN	GENERAL
GF	GROUND FACE
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GFE	GOVERNMENT-FURNISHED EQUIPMENT
GFE/CI	GOVERNMENT-FURNISHED EQUIPMENT
	CONTRACTOR INSTALLED
GG	GOLDEN GATE DAM
GI	GALVANIZED IRON
GIP	GALVANIZED IRON PIPE
GKT	GASKET(ED)
GL	GLASS
GL BLK	GLASS BLOCK
GLF	GLASS FIBER
GLZ	GLAZING
GLZ CMU	GLAZED CONCRETE MASONRY UNITS
GND	GROUND
GOVT	GOVERNMENT
GPM	GALLONS PER MINUTE
GPT	GYPSUM TILE
GRAN	GRANITE
GR LN	GRADE LINE
GRTG	GRATING
GST	GLAZED STRUCTURAL TILE
GSU	GLAZED STRUCTURAL UNITS
GT	GROUT
GWT	GLAZED WALL TILE
GYP	GYPSUM
GYP BD	GYPSUM BOARD
GYP PLAS	GYPSUM PLASTER
H	HEIGHT
HB	HOSE BIBB
HC	HOLLOW CORE
HCD	HALON CONTAINMENT DAMPER
HCP	HANDICAPPED
HD	HEAD
HD	HEAVY DUTY
HDBD	HARDBOARD
HD JT	HEAD JOINT
HDR	HEADER
HDW	HARDWARE
HDWD	HARDWOOD
HES	HIGH EARLY-STRENGTH CEMENT
HEX	HEXAGON
HH	HANDHOLE
HK	HOOK(S)
HM	HOLLOW METAL
HNDRL	HANDRAIL
HORIZ, HOR	HORIZONTAL
HP	HINGE POINT, HIGH PRESSURE, HORSEPOWER
HPT	HIGH POINT
HPU	HYDRAULIC POWER UNIT
HR	HOUR
HS	HIGH STRENGTH
HSGYP	HIGH-STRENGTH GYPSUM PLASTER
HSKPG	HOUSEKEEPING
HT	HEIGHT
HTG	HEATING
HTR	HEATER
HVAC	HEATING, VENTILATING AND AIR CONDITIONING
HW	HEADWALL, HIGH WATER
HWM	HIGH WATER MARK
HWY	HIGHWAY
HYDR	HYDRAULIC
Hz	HERTZ
I-80	INTERSTATE 80
IB	IMPORTED BORROW
IC	INTERCOM
ID	INSIDE DIAMETER
IE	INVERT ELEVATION
IESNA	ILLUMINATING ENGINEERING SOCIETY OF
	NORTH AMERICA
ILK	INTERLOCK
IN	INCH, INCHES
INCIN	INCINERATOR
INCL	INCLUDED
INSF	INSULATING FILL
INSUL	INSULATION
INT	INTERIOR
INTM	INTERMEDIATE
INV	INVERT
I/O	INLET/OUTLET
IP	IRON PIPE
IPS	IRON PIPE SIZE
I.P.S.	INSIDE PIPE SIZE
IR	IRRIGATION
JAN CLO	JANITOR'S CLOSET
J-BOX	JUNCTION BOX
JCT	JUNCTION
JST	JOIST
JT	JOINT
KIP	KILOPOUND (1000 POUNDS)
KIT	KITCHEN
KOP	KNOCKOUT PANEL
KPL	KICKPLATE
kV	KILOVOLTS
kVA	KILOVOLT AMPERES
kVAR	KILOVOLT AMPERES REACTIVE
kW	KILOWATT
KWY	KEYWAY
L	LENGTH
LAB	LABORATORY
LAD	LADDER
LAM	LAMINATE
LAT	LEAVING AIR TEMPERATURE
LAU	LAUNDRY
LAV	LAVATORY
LB	LAG BOLT
LB	POUND
LBL	LABEL
LBR	LUMBER
LC	LIGHT CONTROL
LD	LOAD
LDCC	LOW DENSITY CELLULAR CONCRETE
LDG	LOADING
LF	LINEAR FOOT (FEET)
LG	LENGTH
LH	LEFT HAND(ED)
LIN	LINEAR
LKR	LOCKER
LL	LIVE LOAD
LLD	LEAD-LINED DOOR
LM	LUMEN
LMST	LIMESTONE
LNTL	LINTEL
LOC	LOCATION
LOL	LAYOUT LINE
LONG	LONGITUDINAL
LP	LIGHTPROOF
LPD	LIGHTPROOF DOOR
LPL	LIGHTPROOF LOUVER
LPT	LOW POINT
LR	LONG RADIUS, LIVING ROOM
LS	LANDSIDE, LAWN SPRINKLER
LT	LEFT, LIGHT
LT WT	LIGHTWEIGHT
LTG	LIGHTING
LTNG	LIGHTNING
LVR	LOUVER
LWC	LIGHTWEIGHT CONCRETE
LWT	LEAVING WATER TEMPERATURE
m	METER(S)
M&B	MATCHED AND BEADED
MAINT	MAINTENANCE
MACH	MACHINE
MAF	MILLION ACRE FEET
MAS	MASONRY
MATL	MATERIAL(S)
MAX	MAXIMUM
MB	MACHINE BOLTS
MBR	MEMBER
MC	MEDICINE CABINET
MCJ	MASONRY CONTROL JOINT
MCO	METAL-CASED OPENING
MDS	METAL DIVIDER STRIP
MECH	MECHANICAL
MECH RM	MECHANICAL ROOM
MED	MEDIUM
MEMB	MEMBRANE
MES	METAL EDGE STRIP
MFD	METAL FLOOR DECKING
MFG	MANUFACTURING
MFR	MANUFACTURER
MG	MOTOR GENERATOR
MGT	MATTE-GLAZED TILE
MH	MANHOLE
MI	MALLEABLE IRON
MIN	MINIMUM
MIRR	MIRROR
MISC	MISCELLANEOUS
ML	METAL LATH
ML	MONOLITHIC
MLDG	MOULDING
MLWK	MILLWORK
mm	MILLIMETER(S)
MNIC	MATERIAL NOT IN CONTRACT
	(INSTALLATION BY CONTRACTOR)
MO	MASONRY OPENING
MOD	MODULAR
MOD.	MODIFIED, MODIFY
MON	MONUMENT
MOT	MOTOR
MP	MOVABLE PARTITION
MPG	MAXWELL / SITES PUMPING AND GENERATING
MR	MOP RECEPTOR
MRB	MARBLE BASE
MRD	METAL ROOF DECKING
MS	MACHINE SCREWS
MT	METAL THRESHOLD
MT	MOUNT
MTD	MOUNTED
MTFR	METAL FURRING
MTL	METAL
MVBL	MOVABLE
MULL	MULLION
MUTD	MANUAL FOR UNIFORM TRAFFIC CONTROL DEVICES
MW	MONITORING WELL
N	NORTH
N/A	NOT APPLICABLE
NAD83	NORTH AMERICAN DATUM OF 1983
NAS	NORTH AREA STREAMS
NAT	NATURAL
NAVD88	NORTH AMERICAN VERTICAL DATUM OF 1988
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURERS
ASSOCIATION	
NEMDC	NATOMAS EAST MAIN DRAINAGE CANAL
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NGS	NATIONAL GEODETIC SURVEY
NGVD	NATIONAL GEODETIC VERTICAL DATUM
Ni	NICKEL
NIC	NOT IN CONTRACT
NL	NAILABLE
N.L.	NEOPRENE LATEX
N.M.W.S.	NEW MAX WATER SURFACE
NM	NONMETALLIC
NO	NUMBER, NORMALLY OPEN
NOM	NOMINAL
NR	NOISE REDUCTION
NRC	NOISE REDUCTION COEFFICIENT
N'REQD	NOT REQUIRED
NTS	NOT TO SCALE
O-O	OUT-TO-OUT
OA	OUTSIDE AIR
OBSC	OBSCURE
OBW	OBSERVATION WINDOW
OC	ON CENTER
OCEW	ON CENTER EACH WAY
OD	OUTSIDE DIAMETER
OFC	OFFICE
OFST	OFFSET
OG	ORIGINAL GROUND
OGL	OBSCURE GLASS
OH	OVERHEAD
OHW	OVERHEAD WIRE
OHWM	ORDINARY HIGH WATER MARK
OHMS	OVALHEAD MACHINE SCREW
OHWS	OVALHEAD WOOD SCREW
OPH	OPPOSITE HAND
OPNG	OPENING
OPP	OPPOSITE
OPQ	OPAQUE
OPS	OPERATIONS
OPT	ONE PASS TRENCH METHOD
OPTN	OPTION
OS & Y	OUTSIDE SCREW AND YOKE
OSHA	OCCUPATIONAL SAFETY AND HEALTH
	ADMINISTRATION
OWGL	OBSCURE WIRED GLASS
P	POLE
PA	PUBLIC ADDRESS
PAR	PARALLEL
PB	PANIC BAR
PBD	PARTICLE BOARD
PBS	PUSH BUTTON STATION
PC	POINT OF CURVATURE, PIECE
PCC	POINT OF COMPOUND CURVE, PRECAST CONCRETE
PCF	POUNDS PER CUBIC FOOT
PCP	CEMENT PLASTER (PORTLAND)
PCVC	POINT OF COMPOUND VERTICAL CURVE
PD	PAVEMENT DRAIN
PED	PEDESTAL
PERF	PERFORATE(D)
PERIM	PERIMETER
PG	PROFILE GRADE
PG&E	PACIFIC GAS & ELECTRIC
PGP	PUMPING AND GENERATING PLANT
PH	PILOT HOLE, PHASE
PHAR	PHARMACY
PI	POINT OF INTERSECTION
PIPU	PREFAB ISOLATION POWER UNIT
PIV	POST INDICATING VALVE
PL	PROPERTY LINE, PLATE
P/L	PROPERTY LINE
PLAM	PLASTIC LAMINATE
PLAS	PLASTER
PLAT	PLATFORM
PLBG	PLUMBING
PLF	POUNDS PER LINEAR FOOT
PLG	PILING
PL GL	PLATE GLASS
PLYWD	PLYWOOD
PNL	PANEL
PT	PAINT(ED)
POB	POINT OF BEGINNING
POC	POINT OF HORIZONTAL CURVE
POE	POINT OF ENDING
POI	POINT OF INTERCONNECTION
POL	POLISHED
PORC	PORCELAIN
PORT	PORTABLE
POT	POINT OF TANGENT
POVC	POINT OF VERTICAL CURVE
PP	POWER POLE
PPGL	POLISHED PLATE GLASS
PPM	PARTS PER MILLION
PR	PAIR
PRC	POINT OF REVERSE CURVE
PREFAB	PREFABRICATE(D)
PREFIN	PREFINISHED
PREFMD	PREFORMED
PRKG	PARKING
PROJ	PROJECT
PRV	PRESSURE-REGULATING VALVE
PRVC	POINT OF REVERSE VERTICAL CURVE
PS	PUMP STATION, PIPE SPACE
P.S.	PRESSED STEEL
PS&E	PLANS, SPECIFICATIONS AND ESTIMATES
PS CONC	PRESTRESSED CONCRETE
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PT	POINT OF TANGENCY, PNEUMATIC TUBE
PT.	POINT
PT CONC	POST-TENSIONED CONCRETE
PTD	PAPER TOWEL DISPENSER
PTN	PARTITION
PTR	PAPER TOWEL RECEPTACLE
PV	PAVED
PVC	POLYVINYL CHLORIDE
PVG	PAVING
PVMT	PAVEMENT
PW	PASS WINDOW
PWS	PIPELINE WARNING SIGN
QT	QUARRY TILE
QT.	QUART
QTR	QUARTER
1/4 RND	QUARTER ROUND
QTY	QUANTITY
R	RADIUS, RANGE, RISER
RA	RETURN AIR
RAB	RABBETED
RA GR	RETURN AIR GRILLE
RAR	RETURN AIR REGISTER
RB	RUBBER BASE, RESILIENT BASE
RBL	RUBBLE STONE
RBR	RUBBER
RC	REMOTE CONTROL
RCP	REINFORCED CONCRETE PIPE
RCVR	RECEIVER
RD	ROAD, ROOF DRAIN
RDG INS	RIGID INSULATION
RDY	ROADWAY
RECPT	RECEPTACLE
REC ROOM	RECREATION ROOM
RECT	RECTIFIER
REF	REFERENCE
REFL	REFLECT
REFR	REFRIGERATION
REG	REGISTER
REG	REGLET
REINF	REINFORCE
REL	RELOCATE
REM	REMOVE(ABLE)
REPL	REPLACEMENT
REQD	REQUIRED
RESIL	RESILIENT
RET	RETAINING, RETURN
REV	REVISED, REVISION
RFG	ROOFING
RH	RELATIVE HUMIDITY
RH	RIGHT HAND
RH	ROOF HATCH
RK	RACK
RLG	RAILING
RM	RIVER MILE, ROOM
RND	ROUND
RO	ROUGH OPENING
ROW	RIGHT OF WAY
RP	RADIUS POINT, RETRACTABLE PARTITION
RPM	REVOLUTIONS PER MINUTE
RPRT	RAISED PATTERN RUBBER TILE
RR	RAILROAD
RSP	ROCK SLOPE PROTECTION
RT	RIGHT
RTE	ROUTE
RTF	RUBBER TILE FLOOR
RVS	REVERSE
RVT	RIVET
R/W, ROW	RIGHT-OF-WAY
RW	RELIEF WELL, RAW WATER
RWC	RAINWATER CONDUCTOR
S	SOUTH
SA	SUPPLY AIR
SAFCA	SACRAMENTO AREA FLOOD CONTROL AGENCY
S.B.	SECURITY BARS
SB	SOIL BENTONITE, SPLASH BLOCK
SBF	SOUTH BAY FOUNDRY
SC	SOLID CORE
SCB	SOIL-CEMENT-BENTONITE
SCCB	SLAG CEMENT-CEMENT-BENTONITE
SCH, SCHED	SCHEDULE
SCRN	SCREEN
SCT	STRUCTURAL CLAY TILE
SD	SADDLE DAM, STORM DRAIN
SDI	STEEL DOOR INSTITUTE
SECT	SECTION
SEQ	SEQUENCE
SFGL	SAFETY GLASS
SFTU	STRUCTURAL FACING TILE UNIT
SFU	STRUCTURAL FACING UNIT
SG	SHEET GLASS
SHLDR	SHOULDER
SHT	SHEET
SHTHG	SHEATHING
SHV	SHELVING
SIM	SIMILAR
SJI	STEEL JOIST INSTITUTE
SKLT	SKYLIGHT
SLO	SLOPE
SLNT	SEALANT
SLV	SLEEVE
SM	SHEET METAL
SMS	SHEET METAL SCREWS
SOV	SHUT OFF VALVE
SPC	SPACER
SPCL	SPECIAL
SPD	SOUNDPROOF DOOR
SPEC	SPECIFICATION, SPECIAL
SPF	SOUNDPROOF
SP FIN	SPECIAL FINISH
SPH	SPACE HEATER
SPKR	SPEAKER
SQ	SQUARE
SQHD	SQUARE HEAD
S&R	SHELF AND ROD
SS	SANITARY SEWER, SERVICE SINK,
	STANDING SEAM (ROOF)
SST	STAINLESS STEEL
ST	STREET
STA	STATION
STD	STANDARD
STG	SEATING
STL	STEEL
STOR	STORAGE
ST PR	STATIC PRESSURE
STR	STRINGER
STRUCT	STRUCTURAL
STWY	STAIRWAY
SUB FL	SUBFLOOR
SUSP	SUSPENDED
SV	SHEET VINYL
SW	SWITCH
SWBD	SWITCHBOARD
SWPPP	STORM WATER POLLUTION PREVENTION PLAN
SWR	SEWER
SYM	SYMBOL
SYMM	SYMMETRICAL
SYNTH	SYNTHETIC
SYS	SYSTEM
T	TREAD
TAN	TANGENT
TB	TOWEL BAR
TBD	TO BE DETERMINED
TC	TERRA COTTA/ TEHAMA-COLUSA
T-C	TEHAMA-COLUSA
TCCA	TEHAMA-COLUSA CANAL AUTHORITY
TCP	TRAFFIC CONTROL PLAN
TEL	TELEPHONE
TEMP	TEMPORARY, TEMPERATURE
TER	TERRAZZO
TERM	TERMINAL
T&G	TONGUE AND GROOVE
TG	TOP OF GRADE
TGL	TOGGLE
TH	TRUSS HEAD
THK	THICK(NESS)
THRES	THRESHOLD
THW	TOP OF HEADWALL
TK BD	TACKBOARD
TKS	TACKSTRIP
TO	TOP OF
TOC	TOP OF CONCRETE
TOL	TOP OF LEVY, TOLERANCE
TOP	TOP OF PIPE
TOPO	TOPOGRAPHY
TOS	TOP OF SLOPE, TOP OF SLAB, TOP OF STEEL
TOT	TOTAL
TOW	TOP OF WALL
TP	TELEPHONE POLE
TPD	TOILET PAPER DISPENSER
TPTN	TOILET PARTITION
TRANS	TRANSITION, TRANSOM, TRANSVERSE
TRR	TERMINAL REGULATING RESERVOIR
TRW	TERMINAL REGULATING RESERVOIR WEST
TSTAT	THERMOSTAT
TV	TELEVISION
TYP	TYPICAL
UC	UNIT COOLER
UG, UGND	UNDERGROUND
UH	UNIT HEATER
UL	UNDERWRITERS LABORATORIES
ULDC	URBAN LEVEE DESIGN CRITERIA
UNEX	UNEXCAVATED
UNFIN	UNFINISHED
U.P.R.R.	UNION PACIFIC RAILROAD
UPS	UNINTERRUPTIBLE POWER SUPPLY
UR	URINAL
US	UPSTREAM
USACE	U.S. ARMY CORPS OF ENGINEERS
USBR	UNITED STATES BUREAU OF
	RECLAMATION
UTIL	UTILITY
UV	UNIT VENTILATOR
V	VOLT
VAC	VACUUM
VAR	VARIES, VARNISH
VB	VINYL BASE
VC	VERTICAL CURVE
VCT	VINYL COMPOSITION TILE
VCT	VITRIFIED CLAY TILE
VD	VAULT DOOR
VENT	VENTILATOR(TION)
VERT	VERTICAL
VEST	VESTIBULE
VF	VINYL FABRIC
VFD	VARIABLE FREQUENCY DRIVE
VG	VERTICAL GRAIN
VH	VINYL HOMOGENEOUS
VJ	V-JOINT(ED)
VNR	VENEER
VOL	VOLUME
VR	VAPOR RETARDER
VRM	VERMICULITE
VS	VENT STACK
V.T.	VOLTAGE TRANSFORMER
VTR	VENT THRU ROOF
VWC	VINYL WALL COVERING
W	WEST, WATER
W/	WITH
W/OUT	WITHOUT
WB	WET BULB
WBL	WOOD BLOCKING
WC	WATER CLOSET
W/C	WHEELCHAIR
WCO	WOOD-CASED OPENING
WD	WIDTH, WOOD, WOOD DOOR
WDSP	WASTE DISPOSER
WDW	WINDOW
WF	WIDE FLANGE
WGL	WIRED GLASS
WH	WALL HUNG
WH	WATER HEATER
WHB	WHEEL BUMPER
WHM	WATT-HOUR METER
WI	WROUGHT IRON
WKSH	WORK SHOP
WM	WATER METER, WIRE MESH
W/O	WITHOUT
WP	WATERPROOF(ING)
WP	WEATHERPROOF
WP	WORKING POINT
WR	WASTE RECEPTACLE
WRB	WARDROBE
WS	WATER SURFACE, WATERSTOP
W.S.	WASTE STACK
WSCT	WAINSCOT
WSD	WATERSIDE
WSE	WATER SURFACE ELEVATION
WSP	WELDED STEEL PIPE
WT	WEIGHT
WTH	WIDTH
WV	WATER VALVE
W/W	WALL TO WALL
WWF	WELDED WIRE FABRIC
WWM	WELDED WIRE MESH
WWR	WELDED WIRE REINFORCEMENT
WY	WAY
XFMR	TRANSFORMER
XSEC	CROSS SECTION
YD	YARD
YD	YARD DRAIN
YR	YEAR
YRS	YEARS

REV	DATE	BY	CHK.	APPR.	DESCRIPTION
				P.RU	

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SITES RESERVOIR

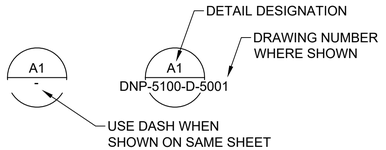
DUNNIGAN PIPELINE
GENERAL
ABBREVIATIONS

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

DRAWING NO.
DNP-0001-G-0010
SHT 3 OF 55

PRELIMINARY - NOT FOR CONSTRUCTION

GENERAL SYMBOLS



0330-056 STANDARD DETAIL

ON DRAWING WHERE DETAIL OR SECTION IS CALLED OUT

ON DRAWING WHERE DETAIL OR SECTION IS SHOWN

DRAWING NUMBERING LEGEND

DNP-5100-S-2001

- DNP: LOCATION / PACKAGE CODE
- 5100: FACILITY / AREA NUMBER
- S: DISCIPLINE DESIGNATOR
- 2001: DRAWING TYPE CODE

PACKAGE NUMBER - CODE - LOCATION

1 - STS - SITES RESERVOIR
2 - MPG - MAXWELL-SITES PUMPING AND GENERATING
3 - SCD - RESERVOIR CLEARING AND DEMOLITION
4 - HFR - HUFFMASTER ROAD
5 - DNP - DUNNIGAN PIPELINE
6 - CCA - TEHAMA-COLUSA CANAL AUTHORITY
7 - CID - GLENN-COLUSA IRRIGATION DISTRICT
8 - REC - SITES RECREATION
9 - MIT - SITES MITIGATION

AREA NUMBER - FACILITY

0001 - GENERAL
0010 - GEOTECHNICAL
0045 - OVERALL SITE CIVIL
0060 - OVERALL SITE ELECTRICAL
0065 - INSTRUMENTATION AND CONTROLS
5005 - ACCESS ROADS
5010 - TEMPORARY CONSTRUCTION
5020 - PIPELINE
5100 - T-C CANAL INLET STRUCTURE
5200 - CBD DISCHARGE STRUCTURE
5900 - STANDARD DETAILS

DISCIPLINE DESIGNATOR

A - ARCHITECTURAL
B - GEOTECHNICAL
C - CIVIL
D - PROCESS MECHANICAL
E - ELECTRICAL
F - FIRE PROTECTION
FET - FOUNDATION EXCAVATION AND TREATMENT
G - GENERAL
H - HVAC
I - INTERIORS
J - PLUMBING
K - TRANSMISSION
L - LANDSCAPE
M - BUILDING MECHANICAL
N - INSTRUMENTATION AND CONTROLS
P - PIPELINE
Q - EQUIPMENT
R - ROADWAY
S - STRUCTURAL
T - TELECOMMUNICATIONS
V - SURVEY MAPPING
Y - YARD PIPING

DRAWING TYPE CODE

0000 - GENERAL AND 3D RENDERINGS
1000 - DEMOLITION
2000 - PLANS AND PLAN AND PROFILE
3000 - SECTIONS, ELEVATIONS AND PROFILES
4000 - ENLARGED PLANS
5000 - DETAILS
6000 - SCHEDULES AND DIAGRAMS
7000 - USER DEFINED
8000 - USER DEFINED
9000 - STD DETAILS

REV	DATE	BY	CHK.	APPR.	DESCRIPTION

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SITES RESERVOIR

DUNNIGAN PIPELINE
GENERAL
GENERAL SYMBOLS
AND DRAWING NUMBERING LEGEND

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

DRAWING NO.
DNP-0001-G-0020
SHT 4 OF 55

PRELIMINARY - NOT FOR CONSTRUCTION

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LEGEND AND SYMBOLS

EXISTING FEATURES	PROPOSED FEATURES
DRAIN ROCK	
FENCE	
SUBSTATION FENCE	
GATE	
MAJOR CONTOURS	
MINOR CONTOURS	
SILO(S), TANK(S)	
TRAFFIC SIGN	
FIRE HYDRANT	
POST	
TREE	
PALM TREE	
BUSH	
POLE	
SURVEY CONTROL POINT	
MANHOLE	
MISC UTILITY	
UTILITY BOX	
TRAFFIC LIGHT	
UTILITY JUNCTION	
BILLBOARD	
CATCH BASIN, RECT	
VA-TRAF-BARR-POST	
COMMUNICATION ANTENNA	
UTILITY VALVE	
SIGN, REFLECTIVE	
MAILBOX	
STORM DRAIN INLET	
ROAD, CENTER	
ROAD, ALIGNMENT	
ROAD	
DRIVEWAY	
BUILDING OUTLINE	
WALL, RETAINING WALL	
WALL, RETAINING WALL WITH CONC BARRIER	
PIPE, UNIDENTIFIED	
HEADWALL	
CULVERT	
SANITARY SEWER UNDERGROUND PIPE	
SANITARY SEWER MANHOLE	
WATER UNDERGROUND PIPE	
NATURAL GAS UNDERGROUND PIPE	
FIBER OPTIC LINE	
ELEC UNDERGROUND	
ELEC OVERHEAD	
POWER POLE	
GUY WIRE	
GUY ANCHOR	
TRANSMISSION TOWER, METAL	
CANAL	
RAILROAD	
DITCH/FLOW LINE	
STORM DRAIN UNDERGROUND PIPE	
STORM DRAIN MANHOLE	
SLOPE BANK, CUT	
SLOPE BANK, FILL	
SPOT ELEVATION	
BORING LOCATION AND NUMBER	
TEST PIT LOCATION AND NUMBER	
DWR AUGER HOLE	
DWR CORE HOLE	
USBR CORE HOLE	
GEOTECHNICAL BORING	
STRUCTURE, BUILDING OR FACILITY LOCATION POINT - COORDINATES	

EXISTING FEATURES	PROPOSED FEATURES
SLOPE PERCENT OR RISE:RUN	
FLOW ARROW	
DIRECTION ARROW	
WATER SURFACE	
PIEZOMETER	
EARTH SLOPE	
STEEL CHECKER PLATE	
BENTONITE CEMENT GROUT	
BENTONITE PELLET SEAL	
CUTOFF WALL (DETAILS/SECTIONS)	
ORIGINAL GROUND	
AGGREGATE BASE	
DAM/LEVEE FILL	
DAM/LEVEE EMBANKMENT FILL	
FINE SAND	
CONCRETE	
CLSM	
ROCK SLOPE PROTECTION	
ASPHALT CONCRETE PAVEMENT	
GRAVEL SURFACING	
CUTOFF WALL (PLANS)	
LIMITS OF WORK	
BREAK LINE	
PIPE BREAK LINE	
CENTERLINE	
SPRING LINE CENTERLINE	
DEMOLITION	
STRUCTURE, BUILDING OR FACILITY	
EXISTING PIPE TO BE ABANDONED	
EXISTING PIPE TO BE DEMOLISHED	
CONSTRUCTION CONTRACT LIMIT	
CONSTRUCTION EASEMENT	
CABLE TV	
COMMUNICATION	
FIRE PROTECTION WATER SUPPLY	
GUARD RAIL	
PROPERTY LINE	
CONTRACTOR STAGING BOUNDARY	
RIGHT OF WAY	
SILT FENCE	
TELEPHONE OVERHEAD	
TELEPHONE UNDERGROUND	
TEMPORARY CONSTRUCTION EASEMENT	
PERMANENT EASEMENT	

REV	DATE	BY	CHK.	APPR.	DESCRIPTION

DESIGNED BY: B. CHELONIS
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SITES RESERVOIR
DUNNIGAN PIPELINE
GENERAL
CIVIL LEGEND

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

DRAWING NO.
DNP-0001-G-0101
SHT 5 OF 55

PRELIMINARY - NOT FOR CONSTRUCTION

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DESIGN CRITERIA

1. APPLICABLE CODE: 2022 CALIFORNIA BUILDING CODE (CBC) INCLUDING REFERENCED CODES AND STANDARDS.
2. REFER TO FACILITY DRAWINGS FOR ADDITIONAL AND SPECIFIC STRUCTURE LOADINGS AND REQUIREMENTS.
3. ALL LOADS SHOWN ARE SERVICE LEVEL (UNFACTORED) UNLESS SPECIFICALLY NOTED OTHERWISE.
4. DEAD LOADS: SELF WEIGHT
5. ROOF LOADS:
   - GROUND SNOW LOAD, Pg = 0 PSF
   - ROOF LIVE LOAD = 20 PSF
6. FLOOR LIVE LOADS:
   - PROCESS AREAS = 200 PSF
   - ELECTRICAL AREAS = 300 PSF
   - WALKWAYS AND ELEVATED PLATFORMS = 100 PSF
   - VEHICLE DRIVE AREAS = AASHTO DESIGN TRUCK OR DESIGN TANDEM
7. WIND LOADS:
   - BASIC WIND SPEED (3-SECOND GUST) = 93 MPH, RISK CATEGORY II
   - EXPOSURE CATEGORY = C
8. T-C CANAL INLET STRUCTURE SEISMIC LOADS:
   - MAPPED SPECTRAL RESPONSE ACCELERATIONS
     - S_S = 1.217g
     - S_1 = 0.413g
   - SITE-SPECIFIC DESIGN SPECTRAL RESPONSE ACCELERATIONS
     - S_{DS} =0.TBDg
     - S_{D1} =0.TBDg
   - SITE CLASS = TBD
   - SEISMIC DESIGN CATEGORY = D
9. CBD DISCHARGE STRUCTURE SEISMIC LOADS:
   - MAPPED SPECTRAL RESPONSE ACCELERATIONS
     - S_S = 1.075g
     - S_1 = 0.374g
   - SITE-SPECIFIC DESIGN SPECTRAL RESPONSE ACCELERATIONS
     - S_{DS} =0.TBDg
     - S_{D1} =0.TBDg
   - SITE CLASS = TBD
   - SEISMIC DESIGN CATEGORY = D
10. RISK CATEGORY = SEE FACILITY DRAWINGS
11. IMPORTANCE FACTOR = SEE FACILITY DRAWINGS
12. LATERAL FORCE-RESISTING SYSTEM = SEE FACILITY DRAWINGS
13. T-C CANAL INLET STRUCTURE SOIL DESIGN PARAMETERS:
   - NET ALLOWABLE SOIL BEARING PRESSURES: = TBD PSF (SHALLOW FOUNDATIONS)
   - GROUNDWATER (GW) ELEVATION:
     - MAXIMUM HIGH GW = EL 176.0
   - EQUIVALENT DRAINED FLUID PRESSURES:
     - ACTIVE: = TBD PCF
     - AT REST: = TBD PCF
     - PASSIVE: = TBD PCF
   - EQUIVALENT UNDRAINED FLUID PRESSURES:
     - ACTIVE: = TBD PCF
     - AT REST: = TBD PCF
     - PASSIVE: = TBD PCF
   - DYNAMIC FLUID PRESSURES:
     - YIELDING WALLS LATERAL FORCE: = TBD H LBS (APPLIED AT 0.6H)
     - NON-YIELDING WALLS: = TBD H PSF
     - WHERE H IS HEIGHT OF SOIL ADJACENT TO THE WALL
   - VERTICAL SURCHARGE: = EQUIVALENT 2 FT OF SOIL
   - COEFFICIENT OF FRICTION: = 0.TBD
   - MODULUS OF SUBGRADE REACTION = TBD PCI (1 FT SQUARE PLATE)
   - NATIVE SOIL UNIT WEIGHT = TBD PCF
   - MINIMUM FOOTING EMBEDMENT DEPTH: = TBD IN
14. CBD DISCHARGE STRUCTRE SOIL DESIGN PARAMETERS:
   - NET ALLOWABLE SOIL BEARING PRESSURES: = TBD PSF (SHALLOW FOUNDATIONS)
   - GROUNDWATER (GW) ELEVATION:
     - MAXIMUM HIGH GW = EL 28.8
   - EQUIVALENT DRAINED FLUID PRESSURES:
     - ACTIVE: = TBD PCF
     - AT REST: = TBD PCF
     - PASSIVE: = TBD PCF
   - EQUIVALENT UNDRAINED FLUID PRESSURES:
     - ACTIVE: = TBD PCF
     - AT REST: = TBD PCF
     - PASSIVE: = TBD PCF
   - DYNAMIC FLUID PRESSURES:
     - YIELDING WALLS LATERAL FORCE: = TBD H^2 LBS (APPLIED AT 0.6H)
     - NON-YIELDING WALLS: = TBD H PSF
     - WHERE H IS HEIGHT OF SOIL ADJACENT TO THE WALL
   - VERTICAL SURCHARGE: = EQUIVALENT 2 FT OF SOIL
   - COEFFICIENT OF FRICTION: = 0.TBD
   - MODULUS OF SUBGRADE REACTION = TBD PCI (1 FT SQUARE PLATE)
   - NATIVE SOIL UNIT WEIGHT = TBD PCF
   - MINIMUM FOOTING EMBEDMENT DEPTH: = TBD IN
15. FACTOR OF SAFETY FOR BOUYANCY UPLIFT RESISTANCE:
   - NORMAL OPERATION FOS = 1.5 MINIMUM
   - SCHEDULED MAINTENANCE FOS = 1.25 MINIMUM
   - EXTREME MAINTENANCE FOS = 1.1 MINIMUM

GENERAL INFORMATION

1. FOR ABBREVIATIONS NOT LISTED, SEE ASME Y14.38 “ABBREVIATIONS AND ACRONYMS: PUBLICATION AS DISTRIBUTED BY THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME).
2. DESIGN DETAILS ARE INTENDED TO BE TYPICAL AND SHALL APPLY TO SIMILAR SITUATIONS OCCURRING THROUGHOUT THE PROJECT, WHETHER OR NOT THEY ARE INDIVIDUALLY CALLED OUT.
3. VERIFY FINAL OPENING DIMENSIONS IN WALLS, SLABS, AND DECKS WITH OTHER DISCIPLINE DRAWINGS PRIOR TO CONSTRUCTION OF THESE ELEMENTS.
4. FOR NUMBER, TYPE, SIZE, ARRANGEMENT, AND/OR LOCATION OF EQUIPMENT PADS, SEE OTHER DISCIPLINE DRAWINGS. COORDINATE WITH EQUIPMENT SUPPLIER PRIOR TO PLACING SLABS, WALLS AND FOUNDATIONS. COORDINATE PIPING OPENINGS WITH OTHER DISCIPLINE DRAWINGS.
5. DO NOT CUT OR MODIFY STRUCTURAL MEMBERS FOR PIPES, DUCTS, ETC, UNLESS SPECIFICALLY DETAILED OR APPROVED IN WRITING BY THE ENGINEER.
6. VISITS TO THE JOB SITE BY THE ENGINEER TO OBSERVE THE CONSTRUCTION DO NOT IN ANY WAY MEAN THAT ENGINEER IS GUARANTOR OF CONSTRUCTOR'S WORK, NOR RESPONSIBLE FOR THE COMPREHENSIVE OR SPECIAL INSPECTIONS, COORDINATION, SUPERVISION, OR SAFETY AT THE JOB SITE.

INSPECTION AND TESTING

1. SPECIAL INSPECTION DOES NOT INCLUDE OR WAIVE THE RESPONSIBILITY FOR INSPECTIONS REQUIRED BY THE AUTHORITY HAVING JURISDICTION. THE CONTRACTOR SHALL SCHEDULE BOTH INSPECTIONS.
2. SPECIFIED CONCRETE AND MASONRY AND OTHER MATERIAL TESTING RELATED TO SPECIAL INSPECTION DURING CONSTRUCTION WILL BE OWNER FURNISHED.
3. SPECIFIED LABORATORY TEST MIXES AND SIMILAR TEST RESULTS TO VERIFY MATERIAL QUALITY AND CONFORMANCE TO SPECIFICATIONS, AND SUBMITTED FOR REVIEW PRIOR TO ACCEPTANCE FOR USE ON THE PROJECT, SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
4. SPECIAL INSPECTION AND TESTS AND STRUCTURAL OBSERVATION (OWNER FURNISHED) IS REQUIRED IN ACCORDANCE WITH CBC SECTIONS 110 AND 1704 AS INDICATED IN THE STATEMENT OF SPECIAL INSPECTIONS. REFER TO DRAWINGS [xxx] TO [xxx].

FOUNDATIONS

1. REFER TO GEOTECHNICAL DATA REPORT NO. TBD.
2. EXCAVATIONS SHALL BE SHORED TO PREVENT SUBSIDENCE AND DAMAGE TO ADJACENT EXISTING STRUCTURES, ROADS, UTILITIES, ETC.
3. FOUNDATION BEARING SURFACES SHALL BE OBSERVED BY THE GEOTECHNICAL ENGINEER PRIOR TO PLACEMENT OF FORMWORK OR REINFORCING STEEL. THE OBSERVATION SHALL VERIFY IF THE ACTUAL EXPOSED SUBGRADE IS AS ANTICIPATED BY THE SITE SPECIFIC BORINGS, TEST PITS AND DATA REPORTS.
4. NO BACKFILL SHALL BE PLACED BEHIND WALLS UNTIL THE WALL'S CONCRETE HAS ATTAINED 100 PERCENT AND TOP SUPPORTING SLAB'S CONCRETE HAS ATTAINED 80 PERCENT OF THEIR SPECIFIED 28 DAY COMPRESSIVE STRENGTH, OR UNTIL TOP-OF-WALL FRAMING SYSTEMS, INCLUDING STEEL DIAPHRAGMS, HAVE BEEN COMPLETED.
5. NO BACKFILL SHALL BE PLACED BEHIND CANTILEVERED, FREE TOP, WALLS UNTIL THE CONCRETE HAS ATTAINED 100 PERCENT OF ITS SPECIFIED 28 DAY COMPRESSIVE STRENGTH.
6. USE OF EXPLOSIVES IS ONLY ALLOWED WITH WRITTEN PERMISSION FROM ENGINEER.

FORMWORK, SHORING, AND BRACING

1. STRUCTURES SHOWN ON THE DRAWINGS HAVE BEEN DESIGNED FOR STABILITY UNDER FINAL CONDITIONS ONLY. DESIGN SHOWN DOES NOT INCLUDE NECESSARY COMPONENTS OR EQUIPMENT FOR STABILITY OF THE STRUCTURES DURING CONSTRUCTION. CONTRACTOR IS RESPONSIBLE FOR WORK RELATING TO CONSTRUCTION ERECTION METHODS, BRACING, SHORING, RIGGING, GUYS, SCAFFOLDING, FORMWORK, AND OTHER WORK AIDS REQUIRED TO SAFELY PERFORM THE WORK SHOWN.
2. TEMPORARY SHORING SHALL REMAIN IN PLACE UNTIL ELEVATED CONCRETE FLOOR OR SLABS HAVE REACHED 80 PERCENT OF THE 28 DAY COMPRESSIVE STRENGTH AS DETERMINED BY FIELD CYLINDER BREAKS.
3. “BURY” BARS OR “CARRIER” BARS ARE NOT ALLOWED FOR THE BOTTOM MATS OF REINFORCING IN ALL ELEVATED SLABS AND ARE NOT ALLOWED FOR THE TOP MATS OF REINFORCING IN ELEVATED SLABS LESS THAN 12 INCHES THICK.

CONCRETE REINFORCING

1. REINFORCING STEEL:
   - TYPICAL: ASTM A615, GRADE 60
   - WELDED: ASTM A706, GRADE 60
2. FABRICATION AND PLACEMENT OF REINFORCING STEEL SHALL BE IN ACCORDANCE WITH CRSI “MANUAL OF STANDARD PRACTICE”AND ACI 301 “SPECIFICATIONS FOR STRUCTURAL CONCRETE”.
3. CONCRETE COVER FOR REINFORCING, UNLESS SHOWN OTHERWISE, SHALL BE:
   - WHEN CAST AGAINST EARTH: 3”
   - INTERIOR, DRY, HUMIDITY CONTROLLED AREAS:
     - WALLS AND SLABS: 3/4"
     - BEAM STIRRUPS AND COLUMN TIES: 1 1/2"
   - OTHER CONCRETE SURFACES: 2”
4. REFER TO WALL CORNER AND WALL INTERSECTION REINFORCING STANDARD DETAIL. WALL CORNER REINFORCING SIZES AND SPACINGS SHALL BE AS SHOWN ON THE DRAWINGS AND REFERENCED TO THIS DETAIL. TYPICAL HORIZONTAL WALL REINFORCING SHALL LAP WITH THE CORNER HORIZONTAL REINFORCING.
5. 90 DEGREE BENDS, UNLESS OTHERWISE SHOWN, SHALL BE ACI 318 STANDARD HOOKS.
6. WALL FOOTING CORNER AND INTERSECTION REINFORCEMENT BARS SHALL BE EXTENDED INTO CONNECTING FOOTINGS AND LAPPED ON THE OPPOSITE FACE OF THE CONNECTING FOOTING. OUTSIDE FACE WALL FOOTING REINFORCEMENT SHALL BE LAPPED WITH CORNER BARS. ALL WALL FOOTING REINFORCEMENT SHALL BE CONTINUOUS THROUGH COLUMNS OR PILASTERS FOOTINGS.
7. LAP VERTICAL WALL BARS WITH DOWELS FROM BASE SLABS AND EXTEND INTO TOP FACE OF ROOF SLABS AND LAP WITH TOP SLAB REINFORCEMENT. PROVIDE A MINIMUM OF FOUR FULL HEIGHT VERTICAL BARS WITH MATCHING DOWELS AT WALL ENDS, CORNERS AND INTERSECTIONS WITH SIZE TO MATCH TYPICAL VERTICAL REINFORCING STEEL SHOWN OR REQUIRED BY NOTES ABOVE.
8. LOCATE ELEVATED SLAB AND BEAM TOP BAR SPLICES AT MIDSPAN AND BOTTOM BAR SPLICES AT SUPPORTS.
9. REINFORCING STEEL FOR FOOTINGS AND SLABS ON GRADE SHALL BE ADEQUATELY SUPPORTED ON BAR SUPPORTS WITH SPACERS TO KEEP REINFORCING ABOVE THE PREPARED GRADE. LIFTING REINFORCING OFF GRADE DURING CONCRETE PLACEMENT IS NOT PERMITTED.
10. REFER TO OPENING REINFORCING STANDARD DETAILS.
11. REINFORCEMENT BENDS AND LAPS, UNLESS OTHERWISE NOTED, SHALL SATISFY THE FOLLOWING MINIMUM REQUIREMENTS:

CONCRETE DESIGN STRENGTH = 4,500 PSI **		GRADE 60 REINFORCING STEEL								
BAR SIZE		#3	#4	#5	#6	#7	#8	#9	#10	#11
LAP SPLICE LENGTH ***										
SPACING = 3"	TOP BAR *	1'-4"	1'-8"	2'-1"	3'-0"	5'-2"	6'-8"	8'-6"	10'-10"	13'-4"
	OTHER BAR	1'-4"	1'-4"	1'-8"	2'-4"	4'-0"	5'-2"	6'-7"	8'-4"	10'-3"
SPACING = 4"	TOP BAR *	1'-4"	1'-8"	2'-0"	2'-5"	3'-10"	5'-0"	6'-5"	8'-1"	10'-0"
	OTHER BAR	1'-4"	1'-4"	1'-7"	1'-10"	3'-0"	3'-11"	4'-11"	6'-3"	7'-8"
SPACING ≥ 6"	TOP BAR *	1'-4"	1'-8"	2'-0"	2'-5"	3'-6"	4'-0"	5'-0"	6'-2"	7'-5"
	OTHER BAR	1'-4"	1'-4"	1'-7"	1'-10"	2'-9"	3'-1"	3'-10"	4'-9"	5'-8"
EMBEDMENT LENGTH										
SPACING = 3"	TOP BAR *	1'-0"	1'-3"	1'-8"	2'-4"	4'-0"	5'-2"	6'-7"	8'-4"	10'-3"
	OTHER BAR	1'-0"	1'-0"	1'-3"	1'-10"	3'-1"	4'-0"	5'-1"	6'-5"	7'-11"
SPACING = 4"	TOP BAR *	1'-0"	1'-3"	1'-7"	1'-10"	3'-0"	3'-11"	4'-11"	6'-3"	7'-8"
	OTHER BAR	1'-0"	1'-0"	1'-3"	1'-5"	2'-4"	3'-0"	3'-10"	4'-10"	5'-11"
SPACING ≥ 6"	TOP BAR *	1'-0"	1'-3"	1'-7"	1'-10"	2'-9"	3'-1"	3'-10"	4'-9"	5'-8"
	OTHER BAR	1'-0"	1'-0"	1'-3"	1'-5"	2'-1"	2'-5"	3'-0"	3'-8"	4'-5"

* TOP BARS SHALL BE DEFINED AS ANY HORIZONTAL BARS PLACED SUCH THAT MORE THAN 12" OF CONCRETE IS CAST IN THE MEMBER BELOW THE BAR IN ANY SINGLE POUR. HORIZONTAL WALL BARS ARE CONSIDERED TOP BARS.

** WHERE 3,000 PSI CONCRETE IS USED, INCREASE ABOVE LENGTHS BY 16%.

*** LAP LENGTHS ARE BASED ON MINIMUM CONCRETE COVER OF 2". LONGER LENGTHS ARE REQUIRED FOR CONCRETE COVER LESS THAN 2".

REV	DATE	BY	CHK.	APPR.	DESCRIPTION

DESIGNED BY: J. KELLOGG
DRAWN BY: D. CAVE
CHECKED BY: H. HENRIKSON
IN CHARGE: P. RUDE
DATE: 02-02-2024

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Sites

SITES RESERVOIR

DUNNIGAN PIPELINE
GENERAL
STRUCTURAL NOTES 1

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

DRAWING NO.
DNP-0001-G-0301
SHT 6 OF 55

PRELIMINARY - NOT FOR CONSTRUCTION

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CAST IN PLACE CONCRETE

1. 28-DAY COMPRESSIVE STRENGTHS (TO MEET STRUCTURAL STRENGTH REQUIREMENTS):
   HYDRAULIC STRUCTURES: 4,500 PSI
   CONCRETE FILL AND ENCASEMENTS: 3,500 PSI

2. 56-DAY COMPRESSIVE STRENGTHS (TO MEET DURABILITY REQUIREMENTS FOR ACI 318 AND ACI 350):
   HYDRAULIC STRUCTURES: 5,000 PSI
   CONCRETE FILL AND ENCASEMENTS: 4,000 PSI

3. CONTINUOUS WATERSTOP AS SPECIFIED SHALL BE INSTALLED IN ALL CONSTRUCTION JOINTS IN WALLS AND SLABS OF WATER HOLDING BASINS AND BELOW GRADE STRUCTURES UNLESS SPECIFICALLY NOTED OTHERWISE.

4. CONSTRUCTION JOINTS INDICATED ARE SUGGESTED LOCATIONS. CONTRACTOR MAY REVISE LOCATION OF JOINTS, SUBJECT TO SPECIFIED REQUIREMENTS. LAYOUT SHOWING ALL CONSTRUCTION JOINT LOCATIONS SHALL BE SUBMITTED FOR REVIEW BY ENGINEER.

5. ROUGHEN AND CLEAN CONSTRUCTION JOINTS IN WALLS AND SLABS AS SPECIFIED PRIOR TO PLACING ADJACENT CONCRETE, EXPOSING CLEAN AGGREGATE OF 1/4" AMPLITUDE SOLIDLY EMBEDDED IN MORTAR MIX.

6. COORDINATE PLACEMENT OF OPENINGS, PIPE PENETRATIONS, CURBS, DOWELS, SLEEVES, CONDUITS, BOLTS AND INSERTS PRIOR TO PLACEMENT OF CONCRETE.

7. NO ALUMINUM CONDUIT OR PRODUCTS CONTAINING ALUMINUM OR ANY OTHER MATERIAL INJURIOUS TO THE CONCRETE SHALL BE EMBEDDED IN THE CONCRETE.

8. CONDUIT SHALL NOT BE PLACED PARALLEL WITH BEAM OR COLUMN REINFORCEMENT UNLESS SPECIFICALLY INDICATED IN DRAWINGS.

9. PATCH FORM TIE HOLES IN ACCORDANCE WITH STANDARD DETAILS.

WELDING

1. WELDS SHALL CONFORM TO AMERICAN WELDING SOCIETY (AWS), LATEST EDITION:
   D1.1, STRUCTURAL WELDING CODE – STEEL
   D1.2, STRUCTURAL WELDING CODE – ALUMINUM
   D1.3, STRUCTURAL WELDING CODE – SHEET STEEL
   D1.4, STRUCUTRAL WELDING CODE – REINFORCING STEEL
   D1.6, STRUCTURAL WELDING CODE – STAINLESS STEEL

2. REPAIR WELDS FOUND DEFECTIVE IN ACCORDANCE WITH AWS D1.1 CLAUSE 7.25.

3. USE INTERMITTENT WELDS AND A LOW HEAT INPUT WELDING PROCESS AT FIELD WELDS OF EMBED PLATES AND ANGLES TO AVOID SPALLING OR CRACKING OF THE EXISTING CONCRETE.

4. BUTT JOINT AND GROOVE WELDS SHALL BE COMPLETE JOINT PENETRATION (CJP) UNLESS INDICATED OTHERWISE.

STRUCTURAL STEEL AND METAL FABRICATIONS

1. STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING:

W-SHAPES AND CHANNELS	A992
MISCELLANEOUS SHAPES INCLUDING ANGLES, PLATES, ETC.	A572
SQUARE OR RECTANGULAR STEEL TUBING	A500, GRADE C
STEEL PIPE	A53, GRADE B
STAINLESS STEEL SHAPES	A276

2. ALUMINUM SHALL CONFORM TO THE FOLLOWING STANDARDS:

STRUCTURAL SHAPES	B308
PLATES	B209

3. STRUCTURAL STEEL SHALL BE FABRICATED AND ERECTED IN CONFORMANCE WITH THE AISC MANUAL OF STEEL CONSTRUCTION, CURRENT EDITION, AND CURRENT OSHA STANDARDS.

4. FASTENERS SHALL BE HIGH STRENGTH BOLTS CONFORMING TO THE FOLLOWING EXCEPT WHERE SPECIFICALLY INDICATED OTHERWISE:

UNLESS SHOWN OTHERWISE	F3125, GRADE A325, TYPE1
ANCHOR BOLTS (AB)	
STAINLESS STEEL	F593, AISI TYPE 304 OR 316, CONDITION CW
STEEL	F1554, GR 36
GALVANIZED STEEL	F1554, GR 36 / A153
MACHINE BOLTS (MB)	A307, GRADE B

5. ITEMS TO BE EMBEDDED IN CONCRETE SHALL BE CLEAN AND FREE OF OIL, DIRT AND PAINT.

6. NO HOLES OTHER THAN THOSE SPECIFICALLY DETAILED SHALL BE ALLOWED THROUGH STRUCTURAL STEEL MEMBERS. NO CUTTING OR BURNING OF STRUCTURAL STEEL IS PERMITTED WITHOUT THE WRITTEN APPROVAL OF JACOBS.

7. ALL STEEL MEMBERS EXPOSED TO WEATHER SHALL BE HOT-DIP GALVANIZED TO ASTM A123 UNLESS NOTED OTHERWISE. MEMBERS THAT ARE WELDED AFTER GALVANIZING SHALL BE TOUCHED UP WITH A ZINC RICH COATING AFTER COMPLETIONS AND INSPECTION OF THE WELD.

DEFERRED SUBMITTALS

1. DEFERRED SUBMITTALS ARE THOSE PORTIONS OF THE DESIGN WHICH ARE NOT SUBMITTED AT THE TIME OF PERMIT APPLICATION AND WHICH ARE TO BE SUBMITTED TO THE PERMITTING AGENCY FOR ACCEPTANCE PRIOR TO INSTALLATION OF THAT PORTION OF THE WORK.

2. THE FOLLOWING IS A LIST OF DEFERRED SUBMITTALS THAT ARE EXPECTED TO CONTAIN STRUCTURAL CALCULATIONS OR SAFETY RELATED SYSTEM INFORMATION FOR REVIEW TO MEET BUILDING PERMITTING REQUIREMENTS FOR DESIGNED SYSTEMS. PRIOR TO INSTALLATION OF THE INDICATED STRUCTURAL ELEMENT, EQUIPMENT, DISTRIBUTION SYSTEM, OR COMPONENT OR ITS ANCHORAGE, SUBMIT THE REQUIRED CALCULATIONS AND SUPPORTING DATA AND DRAWINGS FOR REVIEW AND ACCEPTANCE.

SPECIFICATION SECTION	ITEM
01 88 15	ANCHORAGE AND BRACING
40 05 15	PIPING SUPPORT SYSTEMS
OTHER	ANY EQUIPMENT OR COMPONENT IN WHICH A TECHNICAL SPECIFICATION REQUIRES SUBMITTAL OF EQUIPMENT OR ANCHORAGE SYSTEM CALCULATIONS

REV	DATE	BY	CHK.	APPR.	DESCRIPTION

DESIGNED BY: J. KELLOGG
DRAWN BY: D. CAVE
CHECKED BY: H. HENRIKSON
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SITES RESERVOIR

DUNNIGAN PIPELINE
GENERAL
STRUCTURAL NOTES 2

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

DRAWING NO.
DNP-0001-G-0302
SHT 7 OF 55

PRELIMINARY - NOT FOR CONSTRUCTION

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PIPE AND FITTING SYMBOLS

DOUBLE LINE	SINGLE LINE	
		EXISTING PIPE
		NEW PIPE
		EXISTING PIPE TO BE ABANDONED
		EXISTING PIPE TO BE REMOVED
		WELDED JOINT
		GROOVED END JOINT
		FLANGED JOINT
		MECHANICAL JOINT & PROPRIETARY RESTRAINED JOINT
		BELL & SPIGOT JOINT (LEADED)
		HUB & SPIGOT JOINT (RUBBER GASKET)
		BALL JOINT
		ADAPTER SIDE GROOVED END ADAPTER FLANGE
		DISMANTLING JOINT (DMJ)
		FLANGED COUPLING ADAPTER (FCA)
		FLEXIBLE COUPLING
		METAL BELLOWS EXP JOINT
		ELASTOMER BELLOWS EXP JOINT
		ELBOW UP
		ELBOW DOWN
		TEE UP
		TEE DOWN
		LATERAL UP
		LATERAL DOWN

DOUBLE LINE	SINGLE LINE	
		CONCENTRIC REDUCER
		ECCENTRIC REDUCER
		REDUCING BUSHING
		UNION
		CAP
		ANCHOR
		ELBOW, 90 DEGREE
		CROSS
		TEE
		ELBOW, 45 DEGREE
		LATERAL

NOTES:

1. ONLY FLANGED END CONNECTIONS ARE SHOWN HERE FOR DOUBLE LINE FITTINGS. FITTINGS WITH OTHER END PATTERNS ARE SHOWN SIMILARLY ON THE CONSTRUCTION DRAWINGS. ALSO SEE PIPING SPECIFICATIONS.
2. SYMBOLS SHOWN HERE FOR SINGLE LINE FITTINGS ARE GENERIC ONLY. REFER TO PIPING SPECIFICATIONS FOR SPECIFIC END CONNECTIONS FOR SINGLE LINE PIPE AND FITTINGS.
3. EXISTING PIPE AND EQUIPMENT IS SHOWN LIGHT-LINED AND/OR SCREENED AND IS NOTED AS EXISTING. NEW PIPING AND EQUIPMENT IS SHOWN HEAVY-LINED.

VALVE SYMBOLS

SINGLE LINE	DOUBLE LINE
GATE	
KNIFE GATE	OR
BUTTERFLY	OR
GLOBE	OR
BALL	OR
SEATING PORT ECCENTRIC PLUG	OR
PLUG OR COCK	OR
NEEDLE	OR
DIAPHRAGM	OR
PINCH	OR
SWING CHECK	OR
BALL CHECK	OR

HOSE VALVE (HV- X) OR (V-X)
X = NO. IN SPECS

SAMPLE

MUD

PRESSURE RELIEF

AIR AND/OR VACUUM RELEASE

REGULATED SIDE
PRESSURE CONTROL (INTERNAL PILOT)

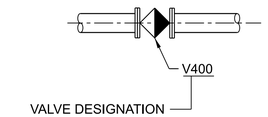
REGULATED SIDE
PRESSURE CONTROL (EXTERNAL PILOT)

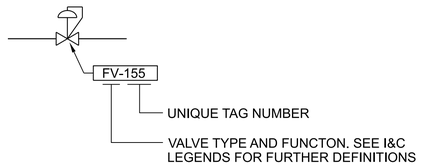
MULTI-PORT VALVE,
ARROWS INDICATE FLOW PATTERN.
SEATING PORTS ARE IMPLIED BY
INDICATED FLOW PATTERN.

TELESCOPING SCUM VALVE

VALVE DESIGNATIONS

MANUAL VALVES AND CHECK VALVES



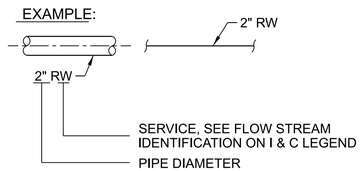


ACTUATOR SYMBOLS

- PNEUMATIC DIAPHRAGM
- PNEUMATIC CYLINDER
- (M) ELECTRIC MOTOR
- (H) HYDRAULIC
- MANUAL
- (S) SOLENOID
- (E/H) ELECTRO HYDRAULIC

PIPING DESIGNATION

EXAMPLE:



GENERAL PIPING NOTES

1. LAY GRAVITY-FLOW PIPE TO UNIFORM GRADE BETWEEN INDICATED ELEVATION POINTS.
2. 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.
3. CONTRACTOR SHALL DESIGN PIPE SUPPORTS AS SPECIFIED. THE ABSENCE OF PIPE SUPPORTS AND DETAILS ON CONTRACT DRAWINGS DOES NOT RELIEVE THE CONTRACTOR OF RESPONSIBILITY OF SIZING AND PROVIDING SUPPORTS THROUGHOUT THE FACILITY.
4. ALL JOINTS SHALL BE WATERTIGHT. WALL PIPES SHALL BE USED WHEREVER PIPING PASSES FROM A STRUCTURE TO BACKFILL.
5. ALL FLEXIBLE CONNECTORS AND COUPLING ADAPTERS SHALL BE PROVIDED WITH THRUST RESTRAINT AS SPECIFIED, UNLESS OTHERWISE NOTED. THRUST RESTRAINT SHALL BE ADEQUATE FOR TEST PRESSURES SPECIFIED.
6. SYMBOLS, LEGENDS, AND PIPE USE IDENTIFICATIONS SHOWN SHALL BE FOLLOWED THROUGHOUT THE DRAWINGS, WHEREVER APPLICABLE. NOT ALL OF THE VARIOUS PIPING COMPONENTS ARE NECESSARILY USED IN THE PROJECT.
7. NUMBER AND LOCATION OF UNIONS SHOWN ON DRAWINGS IS ONLY APPROXIMATE. PROVIDE ALL UNIONS NECESSARY TO FACILITATE CONVENIENT REMOVAL OF VALVES AND MECHANICAL EQUIPMENT.
8. WHERE A FLANGED COUPLING ADAPTER IS SHOWN, A STANDARD FLANGE SHALL BE JOINED TO THE COUPLING ADAPTER.
9. ALL EXISTING PIPE SHALL BE FIELD VERIFIED FOR LOCATION, SIZE AND MATERIAL. PROVIDE THRUST RESTRAINT AT ALL CONNECTIONS TO EXISTING PIPES.
10. THRUST RESTRAINT OF BURIED PIPING SHALL BE ACCOMPLISHED USING MECHANICALLY RESTRAINED JOINTS. THRUST BLOCKS SHALL NOT BE USED, UNLESS SPECIFICALLY IDENTIFIED ON THE DRAWINGS.
11. FLOW STREAM IDENTIFICATIONS ARE SHOWN ON THE INSTRUMENTATION AND CONTROL LEGENDS.
12. FOR PIPE SCHEDULE, SEE 40 05 13.

REV	DATE	BY	CHK.	APPR.	DESCRIPTION

DESIGNED BY: A. LAWHON
DRAWN BY: D. CAVE
CHECKED BY: M. RIESS
IN CHARGE: P. RUDE
DATE: 02-02-2024

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Sites

SITES RESERVOIR

DUNNIGAN PIPELINE
GENERAL
PROCESS MECHANICAL LEGEND AND NOTES

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

DRAWING NO.
DNP-0001-G-0401
SHT 8 OF 55

PRELIMINARY - NOT FOR CONSTRUCTION

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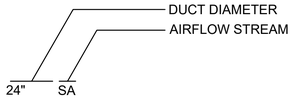
DUCTWORK AND FITTINGS SYMBOLS LEGEND

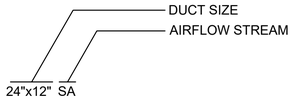
SYMBOL	DESCRIPTION
	DUCT SECTION SUPPLY UP/DOWN
	DUCT SECTION RETURN & EXHAUST UP/DOWN
24"x12" SG1 (300)	GRILLE NECK SIZE, SPECIFICATION NUMBER, CFM, FLOW DIRECTION BY SHEET KEY NOTE
24"x12" EG1 (300)	GRILLE NECK SIZE, SPECIFICATION NUMBER, CFM
12"x12" CD1 (250)	CEILING DIFFUSER NECK SIZE, SPECIFICATION NUMBER, CFM, FLOW DIRECTION BY SHEET KEY NOTE
12"x12" EG2 (100)	CEILING GRILLE NECK SIZE, SPECIFICATION NUMBER, CFM
24"x12" SA	RECTANGULAR DUCT DESIGNATION DUCT SIZE IN INCHES, FLOW STREAM
24"x12" SA	DUCT SIZE IN INCHES, FLOW STREAM
	INCLINED DROP IN DIRECTION OF AIR FLOW
	INCLINED RISE IN DIRECTION OF AIR FLOW
	DUCT FLEXIBLE CONNECTION
	ACCESS DOOR
XXXX-DMP-6XX-YY	DAMPER, TAG NUMBER
	FIRE DAMPER
	VOLUME DAMPER
	SMOKE DAMPER
	COMBINATION FIRE AND SMOKE DAMPER
	GRILLE NECK SIZE, SPECIFICATION NUMBER, CFM, FLOW DIRECTION BY SHEET KEY NOTE
	GRILLE NECK SIZE, SPECIFICATION NUMBER, CFM, FLOW DIRECTION BY SHEET KEY NOTE
	GRILLE NECK SIZE, SPECIFICATION NUMBER, CFM, FLOW DIRECTION BY SHEET KEY NOTE

SYMBOL	DESCRIPTION
	LOUVER DUCT CONNECTION SIZE, ARROW INDICATES INTAKE OR EXHAUST, CFM
	45 DEGREE ENTRY
	CONICAL TEE
	BELLMOUTH
	FLEXIBLE DUCTWORK

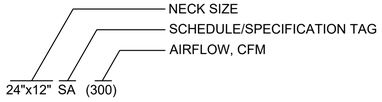
ROUND DUCT DESIGNATION



DUCT DESIGNATION

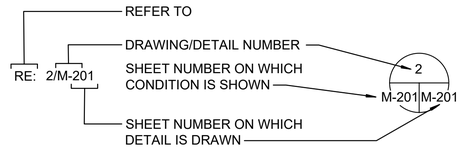


AIR INLET/OUTLET DESIGNATION



MINIMUM CLEAR ACCESS AREA

DRAWING/DETAIL REFERENCE KEY



HVAC EQUIPMENT ABBREVIATIONS:

AHU	AIR HANDLING UNIT
CH	CHILLER
CHWR	CHILLED WATER RETURN
CHWS	CHILLED WATER SUPPLY
CWR	COOLING WATER RETURN
CWS	COOLING WATER SUPPLY
GRV	GRAVITY ROOF VENTILATOR
P	PUMP
EF	EXHAUST FAN
HEX	HEAT EXCHANGER
SF	SUPPLY FAN
SF	SUPPLY GRILLE
VFD	VARIABLE FREQUENCY DRIVE

GENERAL HVAC NOTES

1. ALL DIMENSIONS ARE INCHES UNLESS OTHERWISE NOTED.
2. VERIFY AND COORDINATE EQUIPMENT LAYOUT, SIZE, AND CONNECTING SERVICES WITH EQUIPMENT ACTUALLY SELECTED FOR INSTALLATION.
3. DO NOT SCALE DUCTWORK AND EQUIPMENT FOR SIZE.
4. COORDINATE ENTIRE INSTALLATION OF THE HVAC SYSTEMS WITH THE WORK OF ALL OTHER TRADES PRIOR TO ANY FABRICATION OR INSTALLATION.
5. COORDINATE LOCATION AND SIZE OF OPENINGS AND SUPPORTS BASED ON APPROVED HVAC EQUIPMENT, DUCT AND PIPING SHOP DRAWINGS.
6. ALL EQUIPMENT SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE EQUIPMENT MANUFACTURER'S REQUIREMENTS.
7. PROVIDE ALL FITTINGS, TRANSITIONS, DAMPERS, VALVES, AND OTHER DEVICES REQUIRED FOR COMPLETE WORKABLE INSTALLATION.
8. ALL EQUIPMENT, DUCTS, PIPING, AND OTHER DEVICES OR MATERIAL EXPOSED TO THE WEATHER SHALL BE SEALED WATERTIGHT.
9. ALL VALVES, CONTROLS, DAMPERS, FANS, ETC. SHALL BE INSTALLED IN ACCESSIBLE LOCATION. PROVIDE HINGED ACCESS DOOR WHERE REQUIRED.
10. THE LOCATION OF CEILING AIR INLETS AND OUTLETS SHALL BE IN ACCORDANCE WITH ARCHITECTURAL REFLECTED CEILING PLANS.
11. PROVIDE VALVED DRAINS AT LOW POINTS, ALL AIR VENTS, WHERE SPECIFIED AND WHERE SHOWN ON DRAWINGS AND STANDARD DETAILS.
12. PROVIDE ALL MATERIALS AND EQUIPMENT AND PERFORM ALL LABOR REQUIRED TO INSTALL COMPLETE AND OPERABLE MECHANICAL SYSTEMS AS INDICATED ON THE DRAWINGS, AS SPECIFIED AND AS REQUIRED BY CODE.
13. CONTRACT DOCUMENT DRAWINGS FOR HVAC WORK ARE DIAGRAMMATIC AND ARE INTENDED TO CONVEY SCOPE AND GENERAL ARRANGEMENT ONLY.
14. LOCATE ALL TEMPERATURE, PRESSURE, AND FLOW MEASURING DEVICES IN ACCESSIBLE LOCATIONS WITH STRAIGHT SECTION OF PIPE OR DUCT UP-OR DOWN STREAM AS RECOMMENDED BY MANUFACTURER TO ACHIEVE PUBLISHED ACCURACY.
15. ALL CONTROL WIRING SHALL COMPLY WITH THE NATIONAL ELECTRIC CODE AND DIVISION 26 SPECIFICATIONS.
16. CONCRETE HOUSEKEEPING PADS SHALL BE SIZED APPROPRIATELY FOR ACTUAL EQUIPMENT APPROVED FOR INSTALLATION.
17. PROVIDE MAINTENANCE AND SAFETY CLEARANCES AROUND EACH TYPE OF HVAC EQUIPMENT AS SHOWN. SPECIFIED OR OTHERWISE RECOMMENDED BY THE MANUFACTURER.
18. DUCTWORK LAYOUT IS DIAGRAMMATIC ONLY. IN THE PROCESS TO COORDINATE THE DUCT INSTALLATION WITH OTHER TRADES. THE CONTRACTOR MAY REARRANGE THE DUCTWORK DOWNSTREAM OF VAV TERMINAL UNIT FOR AN OPTIMAL LAYOUT. THE FOLLOWING RULES SHALL FOLLOWED.
    - A. MAXIMUM OF FIVE DUCTS CAN BE CONNECTED TO THE VAV DISCHARGE PLENUM.
    - B. MAXIMUM LENGTH OF FLEXIBLE DUCT SHALL NOT EXCEED LENGTH SPECIFIED IN SECTION 23 31 13, PART 3.
    - C. ROUND DUCT SIZE FOR THE TOTAL FLOW THROUGH THE BRANCH SHALL BE AS FOLLOWS:

0-60 CFM	5 INCH	605-900 CFM	14 INCH
65-95 CFM	6 INCH	905-1300 CFM	16 INCH
100-210 CFM	8 INCH	1305-1800 CFM	18 INCH
215-380 CFM	10 INCH	1805-2300 CFM	20 INCH
385-600 CFM	12 INCH		

19. DUCTS SHALL NOT BE REINFORCED WITH TIE RODS OR OTHER INTERNAL REINFORCEMENT EXCEPT FOR DUCT DIMENSIONS GREATER THAN 85 INCH AND STATIC PRESSURE IN EXCESS OF 6 INCHES WG, AS REQUIRED BY SMACNA "HVAC DUCT CONSTRUCTION STANDARDS METAL AND FLEXIBLE", THIRD EDITION.
20. THIS IS A GENERAL LEGEND SHEET FOR HVAC DRAWINGS. SOME ITEMS CONTAINED ON THIS SHEET MAY NOT BE USED ON THIS SPECIFIC PROJECT.
21. ROOFTOP EQUIPMENT CURBS ARE SPECIFIED IN SECTION 23 31 13. SEE ARCHITECTURAL DETAILS FOR FLASHING REQUIREMENTS.
22. "SCREENED" DELINEATION DENOTES EXISTING AND NEW FACILITIES AND IS FOR REFERENCE ONLY. "LIGHT" LINE DELINEATION DENOTES EXISTING MECHANICAL EQUIPMENT AND SYSTEMS. EXISTING FACILITY AND MECHANICAL SYSTEMS INFORMATION WAS TAKEN FROM PREVIOUS DRAWINGS, CONSTRUCTION RECORDS, DATA, AND FIELD SURVEY INFORMATION. ACTUAL LOCATION, ARRANGEMENT, AND DIMENSIONS SHALL BE FIELD VERIFIED AND WORK INSTALLED TO MEET ACTUAL CONDITIONS AND LOCATIONS ENCOUNTERED. "BOLD" (DARK) DELINEATION IS NEW WORK TO BE CONSTRUCTED UNDER THIS CONTRACT.
24. ALL MATERIALS, FITTINGS, COVERS, AND EQUIPMENT INSTALLED IN RETURN AIR PLENUMS SHALL BE NONCOMBUSTIBLE AND UL LISTED FOR USE IN RETURN AIR PLENUMS.
25. ALL PIPE AND DUCT PENETRATIONS THROUGH FIRE RESISTANCE RATED ASSEMBLIES SHALL BE PROVIDED WITH FIRESTOP SYSTEMS, EQUIPMENT AND ACCESSORIES TO RESIST THE PASSAGE OF FIRE, SMOKE AND OTHER GASES. THE ORIGINAL FIRE RESISTANCE RATING OF THE ASSEMBLY PENETRATED SHALL BE MAINTAINED FOR ALL TYPES OF PENETRATIONS. SEE ARCHITECTURAL DRAWINGS FOR RATED ASSEMBLY LOCATIONS.
26. METAL ROOF DECKING OR BOTTOM CHORD OF BAR JOISTS SHALL NOT BE USED FOR THE SUPPORT OF EQUIPMENT, PIPING, OR DUCTWORK UNLESS APPROVED BY THE REGISTERED STRUCTURAL DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE.
27. ALL HANGERS, BRACKETS, OR BRACES FOR DUCTWORK, EQUIPMENT, AND PIPING ARE GENERALLY NOT INDICATED ON THE DRAWINGS. REFER TO SECTION 23 31 13 AND STANDARD DETAILS FOR SUPPORT REQUIREMENTS NOT SHOWN ON THE PLANS.
28. FIELD ROUTED PIPING AND CONDUIT INCLUDING BUT NOT LIMITED TO CONDENSATE, REFRIGERANT AND WIRING FOR H VAC EQUIPMENT AND CONTROLS SHALL NOT CAUSE A TRIPPING HAZARD OR HEAD KNOCKING HAZARD.
29. ALL PIPING AND DUCTWORK SHALL BE ROUTED AS HIGH AS POSSIBLE WITH A MINIMUM HEIGHT OF 8'-0" ABOVE THE WALKING SURFACE UNLESS OTHERWISE INDICATED BY A CENTERLINE, INVERT, OR BOTTOM OF DUCT ELEVATION.
30. PIPING AND DUCTWORK INSTALLED ABOVE SUSPENDED CEILINGS SHALL BE INSTALLED TO ALLOW A MINIMUM 6 INCH CLEARANCE BETWEEN THE TOP OF CEILING ASSEMBLY AND PIPING, BOTTOM OF THE DUCT, OR BOTTOM OF SUSPENDED EQUIPMENT.
31. DUCTWORK SHALL BE FABRICATED, REINFORCED, SUPPORTED AND SEALED FOR OPERATING PRESSURES INDICATED IN THE SPECIFICATIONS FOR THE EQUIPMENT IT SERVES. ALL DUCTWORK SHALL HAVE A MINIMUM SMACNA PRESSURE CLASSIFICATION OF 1 INCH.
32. DUCT SIZES INDICATED ARE CLEAR DIMENSIONS INSIDE THE DUCT OR DUCT LINING. SHEET METAL SIZES ARE LARGER FOR INTERNALLY LINED DUCTWORK.
33. MINIMUM INSULATION THICKNESSES FOR DUCTWORK SHALL BE AS INDICATED IN THE SPECIFICATIONS.
34. DUCT CONNECTIONS TO EQUIPMENT, PIPING SIZES TO EQUIPMENT, AND EQUIPMENT SUPPORTS SHALL BE VERIFIED AND ADJUSTED TO MATCH ACTUAL EQUIPMENT SELECTED FOR INSTALLATION.
35. THE LOCATION OF PIPING AND VALVES TO THE AIR HANDLING AND AIR CONDITIONING EQUIPMENT SHALL NOT INTERFERE WITH FILTER REMOVAL, AIR HANDLING EQUIPMENT SERVICING, OR ELECTRICAL PANEL CLEARANCES.
36. ROOFTOP EQUIPMENT SHALL NOT BE LOCATED SUCH THAT ACCESS TO CONTROLS AND TO PERFORM SERVICE FOR EQUIPMENT IS LOCATED WITHIN 10 FEET OF THE BUILDING EDGE UNLESS THE PARAPET IS 42 INCHES HIGH OR HIGHER.
37. CONTROL DAMPER SIZES SHALL MATCH DIMENSIONS OF ASSOCIATED LOUVER OR DUCT UNLESS OTHERWISE INDICATED.
38. SEISMIC RESTRAINTS/BRACING SHALL BE PROVIDED FOR ALL EQUIPMENT, DUCTWORK, PIPING AND ACCESSORIES IN ACCORDANCE WITH THE MOST STRINGENT REQUIREMENTS OF THE LATEST SMACNA "SEISMIC RESTRAINT MANUAL", PROJECT SPECIFIC SEISMIC REQUIREMENTS, OR THE LATEST EDITION OF "GENERAL SEISMIC REQUIREMENTS FOR DESIGN OF NEW FACILITIES AND UPGRADE OF EXISTING FACILITIES", AS PUBLISHED BY SFPUC ENGINEERING MANAGEMENT BUREAU. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SEISMIC SUPPORTS AND ADDITIONAL/MISCELLANEOUS STEEL REQUIRED FOR PROPER INSTALLATION OF SUPPORTS. SUPPORTS AND SEISMIC RESTRAINTS DESIGN SUBMITTALS SHALL BEAR THE STAMP AND SIGNATURE OF A STATE OF CALIFORNIA LICENSED STRUCTURAL ENGINEER.
39. INSULATION SHALL BE PROVIDED FOR EQUIPMENT, PIPING, AND DUCT SYSTEMS AS INDICATED IN SECTIONS 23 07 00 AND 40 42 00 AND STANDARD DETAILS.
40. BOTTOM OF DUCT (BOD) ELEVATIONS ARE MEASURED FROM FINISHED FLOOR TO THE BOTTOM OF THE DUCT BEFORE APPLYING INSULATION.
41. INSULATED STEAM, STEAM CONDENSATE, HEATING WATER SUPPLY AND RETURN PIPING PENETRATIONS THROUGH WALLS AND FLOORS SHALL BE INSTALLED IN ACCORDANCE WITH STANDARD DETAILS M1020 AND M1021 RESPECTIVELY.

REV	DATE	BY	CHK.	APPR.	DESCRIPTION

DESIGNED BY: S. SHRIEF
DRAWN BY: S. HOSTETLER
CHECKED BY: T. PRICE
IN CHARGE: P. RUDE
DATE: 02-02-2024

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Sites

SITES RESERVOIR
DUNNIGAN PIPELINE
GENERAL
HVAC LEGEND

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

DRAWING NO.
DNP-0001-G-0501
SHT 9 OF 55

PRELIMINARY - NOT FOR CONSTRUCTION

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ONE-LINE DIAGRAM

SYMBOL	DESCRIPTION
	DRAWOUT AIR CIRCUIT BREAKER, LOW VOLTAGE
400	CIRCUIT BREAKER, THERMAL MAGNETIC TRIP SHOWN, 3 POLE, UNO
AS / AF or AT / AF	CIRCUIT BREAKER, STATIC TRIP UNIT, SENSOR AMP TRIP AND FRAME RATINGS SHOWN, 3 POLE, UNO
100/M	CIRCUIT BREAKER, MAGNETIC TRIP SHOWN, TRIP RATING SHOWN, 3 POLE, UNO
400 400	CIRCUIT BREAKER WITH CURRENT LIMITING FUSES, TRIP AND FUSE RATING INDICATED, 3 POLE, UNO
400 225	FUSED SWITCH, SWITCH AND FUSE CURRENT RATING INDICATED, 3 POLE, UNO
100	SWITCH, CURRENT RATING INDICATED, 3 POLE, UNO
60 (3)	FUSE, CURRENT RATING AND QUANTITY INDICATED
1	MAGNETIC STARTER WITH OVERLOAD, NEMA SIZE INDICATED, FVNR UNO
MO	ELECTRONIC STARTER/SPEED CONTROL RVSS = REDUCED VOLTAGE SOFT STARTER ASD = AC ADJUSTABLE SPEED DRIVE DC = DC ADJUSTABLE SPEED DRIVE RVAT = REDUCED VOLTAGE AUTO TRANSFORMER TYPE RVRT = REDUCED VOLTAGE REACTOR TYPE
	CABLE OR BUS CONNECTION POINT
K	KEY INTERLOCK
	SURGE ARRESTER (GAS TYPE)
10	CAPACITOR - KVAR INDICATED, 3 PHASE
3	AC MOTOR, SQUIRREL CAGE INDUCTION - HORSEPOWER INDICATED
G 500/625	GENERATOR, KW/KVA RATING SHOWN
VS V 0-600V	ANALOG METER WITH SWITCH - SCALE RANGE SHOWN V = VOLTAGE KW = KILOWATTS A = AMPERAGE KVAR = KILOVARS PF = POWER FACTOR
MO	DIGITAL POWER METER (MULTIFUNCTION)
	UTILITY REVENUE METER
	GROUND
15 KVA 480-120/240V 1 PH	TRANSFORMER, SIZE, VOLTAGE RATINGS AND PHASE INDICATED
	SHIELDED ISOLATION TRANSFORMER
480-120V (3)	POTENTIAL TRANSFORMER, VOLTAGE RATING AND QUANTITY INDICATED
100:5 (3)	CURRENT TRANSFORMER, RATIO(100:5) AND QUANTITY INDICATED (3)
	CONNECTION POINT TO EQUIPMENT SPECIFIED IN OTHER DIVISIONS. RACEWAY, CONDUCTOR AND CONNECTION IN THIS DIVISION
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
SPD	SURGE PROTECTIVE DEVICE
	DRAWOUT POWER CIRCUIT BREAKER, MEDIUM VOLTAGE
	NON DRAWOUT FUSED SWITCH, MEDIUM VOLTAGE
	DRAWOUT FUSED SWITCH AND CONTACTOR, MEDIUM VOLTAGE

SYMBOL	DESCRIPTION
	DRAWOUT FUSED SWITCH AND VACUUM CONTACTOR, MEDIUM VOLTAGE
	DRAWOUT VACUUM CONTACTOR, MEDIUM VOLTAGE
	MEDIUM VOLTAGE CABLE STRESS CONE TYPE TERMINATION, OPEN TERMINATOR OR BELOW
	SWITCH - LOAD BREAK, GROUP OPERATED, MEDIUM VOLTAGE
	SWITCH W/ARCING HORNS, MEDIUM VOLTAGE
	DISCONNECTING FUSE - SOLID MATERIAL, MEDIUM VOLTAGE
	SWITCH - HOOK STICK OPERATED, SINGLE POLE, MEDIUM VOLTAGE
	FUSE - EXPULSION, HOOK STICK OPERATED, SINGLE POLE, MEDIUM VOLTAGE
	GROUND SWITCH, GANG OPERATED
	TERMINAL BLOCK LUG
△	DELTA CONNECTION
Y	WYE GROUNDED CONNECTION, SOLID GROUND
R or Z	WYE NEUTRAL GROUND RESISTOR OR IMPEDANCE CONNECTION
86	RELAY OR DEVICE, FUNCTION NUMBER AS INDICATED
50:5 (1)	CURRENT TRANSFORMER, ZERO SEQUENCE, RATIO AND QUANTITY INDICATED
800/1200:5 (3)	BUSHING CURRENT TRANSFORMER, MULTI-RATIO AND QUANTITY INDICATED
MCOV 12.7kV (3)	METAL OXIDE SURGE ARRESTER, MAXIMUM CONTINUOUS OVERVOLTAGE RATING AND QUANTITY INDICATED
MPR	MULTI-FUNCTION DIGITAL RELAY MPR = MOTOR PROTECTION RELAY FMR = FEEDER MANAGEMENT RELAY MMR = MAIN MANAGEMENT RELAY GPR = GENERATOR PROTECTIVE RELAY

CONTROL DIAGRAM

SYMBOL	DESCRIPTION
	PUSH-BUTTON SWITCH, MOMENTARY CONTACT, NORMALLY OPEN
	PUSH-BUTTON SWITCH, MOMENTARY CONTACT, NORMALLY CLOSED
	PUSH-BUTTON SWITCH, MAINTAINED CONTACTS WITH MECHANICAL INTERLOCK
	3 POSITION SELECTOR SWITCH MAINTAINED CONTACT
HAND OFF REMOTE	SELECTOR SWITCH - MAINTAINED CONTACT - CHART IDENTIFIES OPERATION WHEN NEEDED FOR CLARITY

POSITION			
CKT	HAND	OFF	REMOTE
1	X	O	O
2	O	O	X

X - CLOSED CONTACT
O - OPEN CONTACT

SYMBOL	DESCRIPTION
	TOGGLE SWITCH, ON-OFF TYPE
ON OFF	SELECTOR SWITCH, ON-OFF TYPE
	MUSHROOM HEAD PUSHBUTTON SWITCH
A	INDICATING LIGHT, PUSH-TO-TEST, LETTER INDICATES COLOR
A	INDICATING LIGHT - LETTER INDICATES COLOR A - AMBER G - GREEN S - STROBE B - BLUE R - RED C - CLEAR W - WHITE
ETM	ELAPSED TIME METER
M	MOTOR STARTER CONTACTOR COIL
CRX	CONTROL RELAY, X INDICATES NUMERICAL ORDER IN CIRCUIT
TDR X	TIME DELAY RELAY, X INDICATES NUMERICAL ORDER IN CIRCUIT
SV X	SOLENOID VALVE, X INDICATES NUMERICAL ORDER IN CIRCUIT
	CONTACT - NORMALLY OPEN
	CONTACT - NORMALLY CLOSED
	REMOTE DEVICE
	TIME DELAY RELAY CONTACT, NORMALLY OPEN, CLOSES WHEN ENERGIZED AND TIMED OUT
	TIME DELAY RELAY CONTACT, NORMALLY CLOSED, OPENS WHEN ENERGIZED AND TIMED OUT
	TIME DELAY RELAY CONTACT, CLOSES WHEN ENERGIZED, OPENS WHEN DE-ENERGIZED AND TIMED OUT
	TIME DELAY RELAY CONTACT, OPENS WHEN ENERGIZED, CLOSES WHEN DE-ENERGIZED AND TIMED OUT
	MOTOR SPACE HEATER
	TERMINAL BLOCK, REMOTE
	TERMINAL BLOCK, INTERNAL
	FUSED TERMINAL BLOCK
	FUSE RATING INDICATED
CPT 120V	TRANSFORMER, CONTROL POWER
	THERMOCOUPLE
	CAPACITOR
+ −	BATTERY

SYMBOL	DESCRIPTION
	LIMIT SWITCH, NORMALLY OPEN, CLOSES AT END OF TRAVEL
	LIMIT SWITCH, NORMALLY CLOSED, OPENS AT END OF TRAVEL
	TEMPERATURE SWITCH, OPENS ON TEMPERATURE RISE
	TEMPERATURE SWITCH, CLOSES ON TEMPERATURE RISE
	FLOAT SWITCH, NORMALLY OPEN, CLOSES ON DESCENDING LEVEL
	FLOAT SWITCH, NORMALLY OPEN, CLOSES ON RISING LEVEL
	PRESSURE SWITCH, NORMALLY CLOSED, OPENS ON RISING PRESSURE
	PRESSURE SWITCH, NORMALLY OPEN, CLOSES ON RISING PRESSURE
	FLOW SWITCH, CLOSES ON INCREASED FLOW
	FLOW SWITCH, OPENS ON INCREASED FLOW
NGR	NEUTRAL GROUND CURRENT LIMITING RESISTOR
RES	CALIBRATING RESISTOR
T GEN	TACHOMETER GENERATOR
GFS	GROUND FAULT SENSOR
	FLASHER
	SEALED CONTACT
	BUZZER
	POTENTIOMETER
	RESISTOR
	BLOWN FUSE INDICATOR
	COAXIAL CABLE
	DUPLEX RECEPTACLE
L U	RELAY, WITH MECHANICAL LATCH
	FULLWAVE DIODE BRIDGE (AC TO DC)

REV	DATE	BY	CHK.	APPR.	DESCRIPTION

DESIGNED BY: C. CUSWORTH
DRAWN BY: E. GARCIA
CHECKED BY: J. LANDMAN
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Sites

SITES RESERVOIR

DUNNIGAN PIPELINE
GENERAL
ELECTRICAL LEGEND 1

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

DRAWING NO.
DNP-0001-G-0601
SHT 10 OF 55

PRELIMINARY - NOT FOR CONSTRUCTION

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POWER SYSTEM PLAN

SYMBOL	DESCRIPTION
	CONNECTION POINT TO EQUIPMENT SPECIFIED. RACEWAY, CONDUCTOR, TERMINATION AND CONNECTION IN THIS DIVISION
MCC-A	MAJOR ELECTRICAL COMPONENT OR DEVICE - NAME OR IDENTIFYING SYMBOL AS SHOWN
	PANELBOARD - SURFACE MOUNTED
LPXXA	PANELBOARD LETTER OR NUMBER FACILITY NUMBER LP - LOW VOLTAGE PANEL DP - DISTRIBUTION PANEL
	PANELBOARD - FLUSH MOUNTED
	TERMINAL JUNCTION BOX
M	MOTOR, SQUIRREL CAGE INDUCTION
G	GENERATOR, VOLTAGE AND SIZE AS INDICATED
LPXXA	HOME RUN - DESTINATION SHOWN
or G	EXPOSED CONDUIT AND CONDUCTORS*
or G	CONCEALED CONDUIT AND CONDUCTORS*

NOTE:
ALL UNMARKED CONDUIT RUNS CONSIST OF TWO NO. 12, ONE NO. 12 GROUND CONDUCTORS IN 3/4" CONDUIT. RUNS MARKED WITH CROSSHATCHES INDICATE NUMBER OF NO. 12 CONDUCTORS. CROSSHATCH WITH SUBSCRIPT "G" INDICATES GREEN GROUND WIRE.

SYMBOL	DESCRIPTION
G	CROSSHATCHES WITH BAR INDICATE NO. 10 CONDUCTOR. SIZE CONDUIT ACCORDING TO SPECIFICATIONS AND APPLICABLE CODE.
[A1]	CONDUIT AND CONDUCTOR CALLOUT, SEE LEGEND.
	CONDUIT DOWN
	CONDUIT UP
	CONDUIT, STUBBED AND CAPPED
	CONDUIT TERMINATION AT CABLE TRAY
EX	EXISTING CONDUIT / DUCT BANK
BD	BUS DUCT - SEE SPECIFICATIONS
CE	CONCRETE ENCASED CONDUIT
DB	DIRECT BURIED CONDUIT
FO	FIBER OPTIC CONDUIT
E-OVH	EXISTING OVERHEAD ELECTRICAL LINE
XXXX	CONCRETE ENCASED DUCT BANK WHERE XXXX IS THE DUCT BANK NAME. SEE CIRCUIT AND RACEWAY CODING DEFINITION
	CONCEALED CONDUIT ROUTING AREA
	CONDUIT ROUTING AREA
	CABLE TRAY
T	TRANSFORMER
J or HH	GENERAL CONTROL OR WIRING DEVICE. LETTER SYMBOLS OR ABBREVIATIONS INDICATE TYPE OF DEVICE
CS	CONTROL STATION, SEE CONTROL DIAGRAMS FOR CONTROL DEVICE(S) REQUIRED
30	NONFUSED DISCONNECT SWITCH, CURRENT RATING INDICATED, 3 POLE
60/40	FUSED DISCONNECT SWITCH, CURRENT RATING INDICATED (60/40, 60 = SWITCH RATING / 40 = FUSE RATING) 3 POLE
2	COMBINATION CIRCUIT BREAKER AND MAGNETIC STARTER, NEMA SIZE INDICATED
100/40	BREAKER SEPARATELY MOUNTED, CURRENT RATING INDICATED (100/40, 100 = FRAME SIZE; 40 = TRIP RATING) 3 POLE
2	CONTACTOR, MAGNETIC, NEMA SIZE INDICATED
L 30	LIGHTING CONTACTOR, CURRENT RATING INDICATED
2	STARTER, MAGNETIC NEMA SIZE INDICATED

SYMBOL	DESCRIPTION
XX 2	CONVENIENCE RECEPTACLE - DUPLEX UNLESS NOTED OTHERWISE WP - WEATHERPROOF C - CLOCK HANGER TL - TWIST LOCK CRE - CORROSION RESISTANT GFCI - GROUND FAULT CIRCUIT INTERRUPTER SUBSCRIPT NUMBER AT RECEPTACLE INDICATES CIRCUIT
	240V RECEPTACLE
	CONVENIENCE RECEPTACLE - QUADRUPLEX
	MULTI OUTLET ASSEMBLY
	DUPLEX CONVENIENCE RECEPTACLE - FLUSH IN FLOOR
	CONVENIENCE RECEPTACLE, PEDESTAL, DUPLEX SINGLE FACE UNLESS INDICATED OTHERWISE
L20R 20	RECEPTACLE, SPECIAL PURPOSE-NEMA CONFIGURATION AND AMPERAGE INDICATED
T	THERMOSTAT
	UTILITY REVENUE METERING FACILITY
	POWER POLE WITH GUY WIRE
	230kV TRANSMISSION LINE STRUCTURE
XX-YY-ZZ	ELECTRICAL BOX/VAULT IDENTIFICATION XX: HH - HANDHOLE MH - MANHOLE PB - PULLBOX YY: MV - MEDIUM VOLTAGE POWER P - LOW VOLTAGE POWER C - CONTROL ZZ: IDENTIFICAITON NUMBER (e.g. 01)

LIGHTING SYSTEM PLAN

SYMBOL	DESCRIPTION
1 or 1	LUMINAIRE, SEE SCHEDULE
1	LUMINAIRE, SEE SCHEDULE
1 or	LUMINAIRE WITH INTERNAL BATTERY BACKUP, SEE SCHEDULE
1	STRIP LUMINAIRE, SEE SCHEDULE
4 or 4	LUMINAIRE AND POLE, SEE SCHEDULE
5 or 5	WALL MOUNTED LUMINAIRE, SEE SCHEDULE
1	FLOOD LIGHTS - AIM IN THE DIRECTION SHOWN
	STANDBY LIGHTING UNIT, SURFACE MOUNTED, SEE SCHEDULE
XX or	EXIT LIGHTS - FILLED SECTION INDICATES LIGHTED FACE, ARROW INDICATES EGRESS DIRECTIONAL INDICATORS, XX = FIXTURE NUMBER, SEE SCHEDULE
$3a or 2a	SMALL LETTER SUBSCRIPT AT SWITCH AND LUMINAIRE INDICATES SWITCHING. SUBSCRIPT NUMBER AT LUMINAIRE INDICATES CIRCUIT
$3	WALL SWITCH: 2- DOUBLE POLE P- PILOT LIGHT 3- THREE WAY K- KEY OPERATED 4- FOUR WAY D- DIMMER WP- WEATHERPROOF CRE- CORROSION RESISTANT EX- EXPLOSIONPROOF L- MOMENTARY 3-WAY M - MOTOR RATED MS- MANUAL STARTER WITH OVERLOADS LV- ON/OFF/DIMMING (0-10V)
OS	OCCUPANCY SENSOR
LC	LIGHTING CONTACTOR
MD	MOTION DETECTOR
PC	PHOTOCELL

GROUND SYSTEM PLAN

	GROUND ROD
	GROUND ROD IN TEST WELL
G	GROUNDING CONDUCTOR, SIZE AS INDICATED
	PIGTAIL FOR CONNECTION TO EQUIPMENT CABINET OR FRAME
G	EQUIPMENT GROUND BUS
N	EQUIPMENT NEUTRAL BUS

ABBREVIATIONS

ABBREVIATIONS	DESCRIPTION
A	AMMETER, AMPERE, AMBER
AF	AMPERE FRAME
AFD	ADJUSTABLE FREQUENCY DRIVE
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AS	AMMETER SWITCH, AMPERE SENSOR
ASU	AIR SUPPLY UNIT
AT	AMPERE TRIP
ATC	AUTOMATIC THROWOVER CONTROL
ATS	AUTOMATIC TRANSFER SWITCH
BC	BARE COPPER
BCP	BRANCH CIRCUIT PANEL
BPP	BRANCH POWER PANEL
BRKR	BREAKER
C	CONDUIT, CONTACTOR
CB	CIRCUIT BREAKER
CC	CONTROL CABLE
CKT	CIRCUIT
CPT	CONTROL POWER TRANSFORMER
CR	CONTROL RELAY
CRE	CORROSION-RESISTANT
CRS	COATED RIGID STEEL CONDUIT
CT	CURRENT TRANSFORMER
DC	DIRECT CURRENT
DIV	DIVISION
E	EMPTY
EO	ELECTRIC OPERATOR
EQPT	EQUIPMENT
ESS	EMERGENCY SHUTDOWN SWITCH
ETM	ELAPSED TIME METER
EXST	EXISTING
FDR	FEEDER
F	FUSE
FLR	FLOOR
FLUOR	FLUORESCENT
FVNR	FULL VOLTAGE NON-REVERSING
FVR	FULL VOLTAGE REVERSING
G	GREEN, GROUND
GALV	GALVANIZED
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GFR	GROUND FAULT RELAY
GND	GROUND
H	HIGH SPEED
HH	HANDHOLE
HID	HIGH INTENSITY DISCHARGE
HPS	HIGH PRESSURE SODIUM
HS	HAND SWITCH
IC	INTERRUPTING CAPACITY
I & C	INSTRUMENTATION AND CONTROL
INCAND	INCANDESCENT
INST	INSTANTANEOUS
M	MAGNETIC CONTACTOR COIL
MCC	MOTOR CONTROL CENTER
MH	MANHOLE, METAL HALIDE
MO	MOTOR OPERATER
MS	MOTOR STARTER
MSC	MFR SUPPLIED CABLE
MT	MOUNT
MTD	MOUNTED
N	NEUTRAL
NA	NON-AUTOMATIC
NC	NORMALLY CLOSED
NL	NIGHT LIGHT
NO	NORMALLY OPEN
NP	NAMEPLATE
OC	ON CENTER
OL	OVERLOAD RELAY
PB	PULL BOX, PUSH BUTTON SWITCH
PC	PHOTOCELL
PH	PHASE
PMR	PHASE MONITOR RELAY
PNL	PANEL
PS	PRESSURE SWITCH
PT	POTENTIAL TRANSFORMER
PVC	POLYVINYL CHLORIDE CONDUIT
R	RED
RCPT	RECEPTACLE
REQD	REQUIRED
RM	REMOTE MULTIPLEXER
RS	RIGID STEEL CONDUIT
RT	REMOTE TELEMETRY
RVNR	REDUCED VOLTAGE NON-REVERSING
RVR	REDUCED VOLTAGE REVERSING
SA	SURGE ARRESTOR
SCCR	SHORT CIRCUIT CURRENT RATING
S/N	SOLID NEUTRAL
SPD	SPEED
SST	STAINLESS STEEL
SV	SOLENOID VALVE
SW	SWITCH
SWBD	SWITCHBOARD
T	THERMOSTAT
TB	TERMINAL BOARD
TC	TIME CLOSE
TD	TEMPERATURE DETECTOR RELAY
TDR	TIME DELAY RELAY
TJB	TERMINAL JUNCTION BOX
T.O.	TIME OPEN
TS	AUTO TRANSFORMER TEMPERATURE SWITCH
TSP	TWISTED SHIELDED PAIR
TST	TWISTED SHIELDED TRIAD
TYP	TYPICAL
UH	UNIT HEATER
UVR	UNDER VOLTAGE RELAY
V	VOLTMETER, VOLT
VS	VOLTMETER SWITCH

ABBREVIATIONS

ABBREVIATIONS	DESCRIPTION
J, J-BOX	JUNCTION BOX
K	KEY INTERLOCK
L	LIGHTING CONTACTOR, LOW SPEED
LOS	LOCKOUT STOP PUSH BUTTON
LR	LATCHING RELAY
LT FLEX	LIQUID TIGHT FLEX CONDUIT
LTS	LIGHTS
W	WATT
WHD	WATTHOUR DEMAND METER
WP	WEATHERPROOF
XFDR	TRANSPONDER
XFMR	TRANSFORMER

REV	DATE	BY	CHK.	APPR.	DESCRIPTION

DESIGNED BY: C. CUSWORTH
DRAWN BY: E. GARCIA
CHECKED BY: J. LANDMAN
IN CHARGE: P. RUDE
DATE: 02-02-2024

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Sites

SITES RESERVOIR

DUNNIGAN PIPELINE
GENERAL
ELECTRICAL LEGEND 2

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

DRAWING NO.
DNP-0001-G-0602
SHT 11 OF 55

PRELIMINARY - NOT FOR CONSTRUCTION

Plot Date: 1/18/2024 4:17 PM
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ONE LINE PROTECTION RELAYING AND ELEMENTARY DIAGRAMS - 1

SYMBOL	DESCRIPTION
(51) or —□— 52	DEVICE FUNCTION NUMBER INDICATED, SEE DEVICE TABLE
(CS T)	CONTROL SWITCH TRIP
(CS C)	CONTROL SWITCH CLOSE
43/CS	43 - DEVICE FUNCTION NUMBER, SEE DEVICE TABLE
□VS	VOLTMETER SWITCH
□AS	AMMETER SWITCH
(A)	INDICATING LAMP - SWITCHBOARD TYPE INDICATING LAMP LENS COLORS INDICATED AS FOLLOWS: A - AMBER R- RED B - BLUE W - WHITE G - GREEN
(V)	VOLTMETER
(A)	AMMETER
(W)	WATTMETER
(F)	FREQUENCY METER
(PF)	POWER FACTOR METER
(WH)	WATT-HOUR METER
(ETM)	ELAPSED TIME METER
	TACHOMETER
(W XD)	WATTS TRANSDUCER
(PF XD)	POWER FACTOR TRANSDUCER
(TD)	TIME DELAY
(4)	RELAY COIL, DEVICE FUNCTION NUMBER PER ANSI 37.2 - AMERICAN STANDARD MANUAL AND AUTOMATIC STATION CONTROL, SUPERVISORY AND ASSOCIATED TELEMETRY EQUIPMENT
7 8	NORMALLY OPEN CONTACT
3 4	NORMALLY CLOSED CONTACT
	REMOTE DEVICE
	TEST SWITCH CURRENT ELEMENT
	TEST SWITCH POTENTIAL ELEMENT
	NEUTRAL CONNECTION
	DIODE
	INSTRUMENTATION CABLE, SHIELDED
NGR	NEUTRAL GROUNDING RESISTOR
PST	PHASE SHIFTING TRANSFORMER

ONE LINE PROTECTION RELAYING AND ELEMENTARY DIAGRAMS - 2

DEVICE FUNCTION NO.	DEVICE DESCRIPTION
21	IMPEDANCE/DISTANCE RELAY
25A	AUTOMATIC SYNCHRONIZER
25C	SYNCH CHECK RELAY
27	UNDERVOLTAGE RELAY
32	REVERSE POWER RELAY
40	GENERATOR LOSS OF EXCITATION RELAY
43CSE	AUTOMATIC POWER TRANSFER AND LOAD CONTROL MODE SEL. SWITCH
43CSX	MODE SEL. SWITCH
46	GENERATOR CURRENT UNBALANCE RELAY
49	THERMAL RELAY
50GS	INSTANTANEOUS OVERCURRENT DEVICE, GROUND SENSOR
50	INSTANTANEOUS OVERCURRENT DEVICE,
51	TIME OVERCURRENT RELAY
51G	TIME OVERCURRENT RELAY, GROUND FAULT
51V	TIME OVERCURRENT, VOLTAGE RESTRAINED
52	POWER CIRCUIT BREAKER
52CSX	POWER CIRCUIT BREAKER CONTROL SWITCH
59	OVERVOLTAGE RELAY
60	VOLTAGE OR CURRENT BALANCE RELAY
65A	ENGINE GOVERNOR, SPEED CONTROL
65A, MOP	ENGINE GOVERNOR, SPEED CONTROL MOTOR OPERATED POTENTIOMETER
65A, RL	ENGINE GOVERNOR, SPEED CONTROL RAISE/LOWER SWITCH
65B	ENGINE GOVERNOR, LOAD CONTROL
65B, MOP	ENGINE GOVERNOR, LOAD CONTROL MOTOR OPERATED POTENTIOMETER
65B, RL	ENGINE GOVERNOR, % LOAD RAISE/LOWER SWITCH
65E	AUTOMATIC POWER TRANSFER AND LOAD CONTROL, WOODWARD APTL
65F	AUTOMATIC GENERATOR LOADING CONTROL, WOODWARD AGLC
67	DIRECTIONAL TIME OVERCURRENT RELAY
74	ALARM RELAY
81O/U	FREQUENCY RELAY, OVER/UNDER
86	LOCKOUT RELAY
87	DIFFERENTIAL PROTECTIVE RELAY
90	VOLTAGE REGULATOR
90, MOP	ENGINE EXCITATION, POWER OPERATED POTENTIOMETER
90PF	ENGINE EXCITATION, POWER FACTOR CONTROL
90RL	ENGINE EXCITATION, RAISE/ LOWER SWITCH

X = DEVICE NUMBER, WHEN THERE ARE MULTIPLE UNITS

GENERAL CIRCUIT CONDUCTOR AND CONDUIT IDENTIFICATION

POWER CIRCUIT CALLOUTS			
[P1]	[1/2"FLEX, 2#12,#12G]	[P24]	[1"C,3#8,3#14,1#10G]
[P2]	[3/4"C,2#12,1#12G]	[P25]	[1"C,3#8,4#14,1#10G]
[P3]	[3/4"C,3#12,1#12G]	[P26]	[1"C,3#8,5#14,1#10G]
[P4]	[3/4"C,4#12,1#12G]	[P27]	[1"C,2#6, 1#10G]
[P5]	[3/4"C,5#12,1#12G]	[P28]	[1"C,3#6, 1#8G]
[P6]	[3/4"C,6#12,1#12G]	[P29]	[1"C,3#6, 2#14,1#8G]
[P7]	[3/4"C,7#12,1#12G]	[P30]	[1 1/4"C,3#6, 3#14,1#8G]
[P8]	[3/4"C,8#12,1#12G]	[P31]	[1 1/4"C,3#6, 4#14,1#8G]
[P9]	[3/4"C,3#12,2#14,1#12G]	[P32]	[1 1/4"C,3#6, 5#14,1#8G]
[P10]	[3/4"C,3#12,3#14,1#12G]	[P33]	[1 1/4"C,3#4,1#8G]
[P11]	[3/4"C,3#12,4#14,1#12G]	[P34]	[1 1/4"C,3#4,3#14,1#8G]
[P12]	[3/4"C,3#12,5#14,1#12G]	[P35]	[1 1/4"C,3#4,5#14,1#8G]
[P13]	[3/4"C,3#12,6#14,1#12G]	[P36]	[1 1/4"C,3#3, 1#6G]
[P14]	[1"C,3#12,7#14,1#12G]	[P37]	[1 1/4"C,3#3, 3#14,1#6G]
[P15]	[3/4"C,2#10,1#10G]	[P38]	[1 1/4"C,3#2, 1#6G]
[P16]	[3/4"C,3#10,1#10G]	[P39]	[1 1/2"C,3#1, 1#6G]
[P17]	[3/4"C,3#10,2#14,1#10G]	[P40]	[2"C,3#1, 3#14,1#6G]
[P18]	[3/4"C,3#10,3#14,1#10G]	[P41]	[2"C,3#2/0, 1#4G]
[P19]	[3/4"C,3#10,4#14,1#10G]	[P42]	[2"C,3#3/0, 1#4G]
[P20]	[1"C,3#10,5#14,1#10G]	[P43]	[2"C,3#4/0, 1#3G]
[P21]	[1"C,2#8,1#10G]		
[P22]	[1"C,3#8,1#10G]		
[P23]	[1"C,3#8,2#14,1#10G]		

ANALOG CIRCUIT CALLOUTS	
[A1]	[3/4"C,1 TYPE 3]
[A2]	[3/4"C,2 TYPE 3]
[A3]	[1"C,3 TYPE 3]
[A4]	[1 1/4"C,4 TYPE 3]
[A5]	[1 1/4"C,5 TYPE 3]
[A6]	[1 1/4"C,6 TYPE 3]
[A7]	[1 1/2"C,7 TYPE 3]
[A8]	[1 1/2"C,8 TYPE 3]
[A9]	[1 1/2"C,9 TYPE 3]
[A10]	[2"C,10 TYPE 3]
[A11]	[2"C,11 TYPE 3]
[A12]	[2"C,12 TYPE 3]
[A13]	[2"C,13 TYPE 3]
[A14]	[2"C,14 TYPE 3]
[A15]	[3/4"C,1 TYPE 4]
[A16]	[3/4"C,2 TYPE 4]
[A17]	[1"C,3 TYPE 4]
[A18]	[1 1/4"C,4 TYPE 4]
[A19]	[1 1/4"C,5 TYPE 4]
[A20]	[1 1/4"C,6 TYPE 4]
[A21]	[1 1/2"C,7 TYPE 4]
[A22]	[1 1/2"C,8 TYPE 4]
[A23]	[2"C,9 TYPE 4]
[A24]	[3/4"C,1-4 pr. TYPE 5]
[A25]	[1"C,2-4 pr. TYPE 5]

CONTROL CIRCUIT CALLOUTS	
[C1]	[3/4"C,MSC]
[C2]	[3/4"C,2#14,1#14G]
[C3]	[3/4"C,3#14,1#14G]
[C4]	[3/4"C,4#14,1#14G]
[C5]	[3/4"C,5#14,1#14G]
[C6]	[3/4"C,6#14,1#14G]
[C7]	[3/4"C,7#14,1#14G]
[C8]	[3/4"C,8#14,1#14G]
[C9]	[3/4"C,9#14,1#14G]
[C10]	[3/4"C,10#14,1#14G]
[C11]	[3/4"C,11#14,1#14G]
[C12]	[3/4"C,12#14,1#14G]
[C13]	[3/4"C,13#14,1#14G]
[C14]	[1"C,14#14,1#14G]
[C15]	[1"C,15#14,1#14G]
[C16]	[1"C,16#14,1#14G]
[C17]	[1"C,17#14,1#14G]
[C18]	[1"C,18#14,1#14G]
[C19]	[1"C,19#14,1#14G]
[C20]	[1"C,20#14,1#14G]
[C21]	[1"C,21#14,1#14G]
[C22]	[1"C,22#14,1#14G]
[C23]	[1"C,23#14,1#14G]
[C24]	[1 1/4"C,24#14,1#14G]
[C25]	[1 1/4"C,25#14,1#14G]

MULTICONDUCTOR POWER CABLE CIRCUIT CALLOUTS	
[PC1]	[3/4"C,1 (3C#12,1#12G) TYPE 2]
[PC2]	[3/4"C,1 (3C#10,1#10G) TYPE 2]
[PC3]	[3/4"C,1 (3C#8,1#10G) TYPE 2]
[PC4]	[3/4"C,2 (3C#12,1#12G) TYPE 2]
[PC5]	[1"C,2 (3C#10,1#10G) TYPE 2]
[PC1A]	[3/4"C,1 (2C#12,1#12G) TYPE 2]
[PC2A]	[3/4"C,1 (2C#10,1#10G) TYPE 2]

EMPTY CONDUIT	
[EC-1]	[3/4"C,WITH PULL STRING]
[EC-2]	[1"C,WITH PULL STRING]
[EC-3]	[1 1/4"C,WITH PULL STRING]
[EC-4]	[1 1/2"C,WITH PULL STRING]
[EC-5]	[2"C,WITH PULL STRING]
[EC-6]	[3"C,WITH PULL STRING]
[EC-7]	[4"C,WITH PULL STRING]
[EC-8]	[5"C,WITH PULL STRING]

MULTICONDUCTOR CONTROL CABLE CIRCUIT CALLOUTS	
[CC3]	[3/4"C,1-3C TYPE 1]
[CC5]	[3/4"C,1-5C TYPE 1]
[CC7]	[3/4"C,1-7C TYPE 1]
[CC9]	[1"C,1-9C TYPE 1]
[CC12]	[1"C,1-12C TYPE 1]
[CC19]	[1 1/2"C, 1-19C TYPE 1]
[CC25]	[1 1/2"C,1-25C TYPE 1]
[CC37]	[2"C,1-37C TYPE 1]
[CCC1]	[1-7C #12 TYPE 1]

NOTES:

1. FOR CABLE TYPES, SEE SPECIFICATIONS.
2. POWER CIRCUIT CALLOUTS ARE BASED ON THE AREA OF THW CONDUCTORS. CONTROL CIRCUIT CALLOUTS ARE BASED ON THE AREAS OF SCHEDULE 40 PVC CONDUIT AND TYPES XHHW & XHHW-2 INSULATION.
3. SIZING OF CONDUCTORS #1AWG AND SMALLER BASED ON AMPACITIES AT 60 DEGREES C, SIZING OF CONDUCTORS #1/0AWG AND LARGER BASED ON AMPACITIES AT 75 DEGREES C.
4. WHERE CIRCUITS ARE UNDERGROUND, DIRECT BURIED OR CONCRETE ENCASED, MINIMUM CONDUIT SIZE SHALL BE 1".
5. FOR METRIC CONDUIT SIZES USE THE FOLLOWING CONVERSION:

REV	DATE	BY	CHK.	APPR.	DESCRIPTION

DESIGNED BY: C. CUSWORTH
DRAWN BY: E. GARCIA
CHECKED BY: J. LANDMAN
IN CHARGE: P. RUDE
DATE: 02-02-2024

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Sites

SITES RESERVOIR

DUNNIGAN PIPELINE
GENERAL
ELECTRICAL LEGEND 3

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

DRAWING NO.
DNP-0001-G-0603
SHT 12 OF 55

PRELIMINARY - NOT FOR CONSTRUCTION

Plot Date: 11/22/2023 9:25 AM File: C:\pwworking\hdr_sites_reservoir\dms01259\DNP-0001-G-0603.dwg
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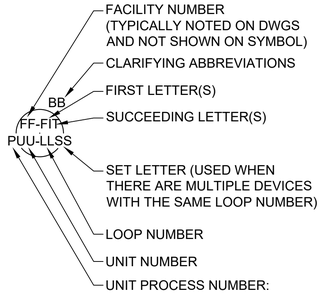
INSTRUMENT IDENTIFICATION

EXAMPLE SYMBOLS



1 = PRIMARY PROCESS
2 = SECONDARY PROCESS
3 = TERTIARY PROCESS
4 = CONTROL/SAFETY SYSTEMS
5 = ELECTRICAL
6 = HVAC
7 = FIRE/SECURITY/ACCESS
8 = BUSINESS
9 = OTHER

INSTRUMENT IDENTIFICATION LETTERS TABLE

LETTER	FIRST-LETTER		SUCCEEDING-LETTERS		
	PROCESS OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	READOUT OR PASSIVE FUNCTION	READOUT OR PASSIVE FUNCTION
A	ANALYSIS (+)		ALARM		
B	BURNER, COMBUSTION		USER'S CHOICE (*)	USER'S CHOICE (*)	USER'S CHOICE (*)
C	USER'S CHOICE (*)			CONTROL	
D	DENSITY (S.G.)	DIFFERENTIAL			
E	VOLTAGE		PRIMARY ELEMENT, SENSOR		
F	FLOW RATE	RATIO (FRACTION)			
G	USER'S CHOICE (*)		GLASS, GAUGE VIEWING DEVICE	GATE	
H	HAND (MANUAL)				HIGH
I	CURRENT (ELECTRICAL)		INDICATE		
J	POWER	SCAN			
K	TIME, TIME SCHEDULE	TIME RATE OF CHANGE		CONTROL STATION	
L	LEVEL		LIGHT (PILOT)		LOW
M	MOTION	MOMENTARY			MIDDLE, INTERMEDIATE
N	TORQUE		USER'S CHOICE (*)	USER'S CHOICE (*)	USER'S CHOICE (*)
O	USER'S CHOICE (*)		ORIFICE, RESTRICTION		
P	PRESSURE, VACUUM		POINT (TEST) CONNECTION		
Q	QUANTITY	INTEGRATE, TOTALIZE			
R	RADIATION		RECORD OR PRINT		
S	SPEED, FREQUENCY	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	
U	MULTI VARIABLE		MULTI FUNCTION	MULTI FUNCTION	MULTI FUNCTION
V	VIBRATION, MECHANICAL ANALYSIS			VALVE, DAMPER, LOUVER	
W	WEIGHT, FORCE		WELL		
X	UNCLASSIFIED (*)	X AXIS	UNCLASSIFIED (*)	UNCLASSIFIED (*)	UNCLASSIFIED (*)
Y	EVENT, STATE OR PRESENCE	Y AXIS		RELAY, COMPUTE, CONVERT	
Z	POSITION	Z AXIS		DRIVE, ACTUATOR, UNCLASSIFIED FINAL CONTROL ELEMENT	

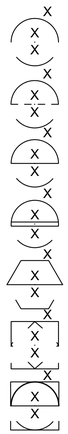
TABLE BASED ON THE INSTRUMENTATION, SYSTEMS, AND AUTOMATION SOCIETY (ISA) STANDARD.

(+) WHEN USED, EXPLANATION IS SHOWN ADJACENT TO INSTRUMENT SYMBOL. SEE ABBREVIATIONS AND LETTER SYMBOLS.
(*) WHEN USED, DEFINE THE MEANING HERE FOR THE PROJECT.

DIGITAL SYSTEM INTERFACES

- ▲ ANALOG INPUT
- ▼ ANALOG OUTPUT
- $\triangle_X$ DISCRETE INPUT
- ∇_X DISCRETE OUTPUT

GENERAL INSTRUMENT OR FUNCTIONAL SYMBOLS



FIELD MOUNTED

REAR-OF-PANEL MOUNTED (OPERATOR INACCESSIBLE)

PANEL MOUNTED (OPERATOR ACCESSIBLE)

MCC MOUNTED

COMPUTER FUNCTION

PLC FUNCTION

SHARED DISPLAY, SHARED CONTROL

TRANSDUCERS

A	ANALOG	I	CURRENT
D	DIGITAL	P	PNEUMATIC
E	VOLTAGE	PF	PULSE FREQUENCY
F	FREQUENCY	PD	PULSE DURATION
H	HYDRAULIC	R	RESISTANCE

EXAMPLE

CURRENT TO PNEUMATIC TRANSDUCER (BACK OF PANEL, IN A FLOW LOOP)

ACCESSORY DEVICES

A	ALARM
C	CONTROLLER
I	INDICATOR
R	RECORDER
S	SWITCH
T	TRANSMITTER
X	UNCLASSIFIED

EXAMPLE

TRANSMITTER AS AN ACCESSORY TO A FLOW ELEMENT

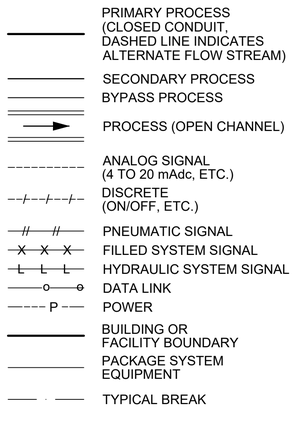
SPECIAL CASES

ON AND OFF EVENT LIGHTS

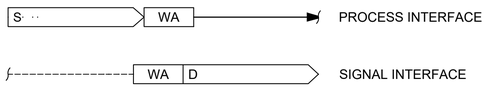
ON-OFF HAND SWITCH, MAINTAINED CONTACT SWITCH (CONTROLLED DEVICE WILL RESTART ON RETURN OF POWER AFTER POWER FAILURE).

STOP-START HAND SWITCH MOMENTARY CONTACT SWITCHES (CONTROLLED DEVICE WILL NOT RESTART ON RETURN OF POWER AFTER POWER FAILURE).

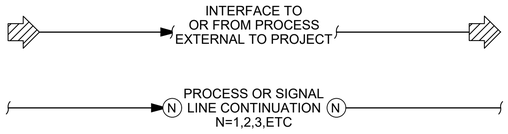
LINE LEGEND



INTERFACE SYMBOLS



W SOURCE UNIT PROCESS NO. (1 OR 2 DIGITS)
A INTERFACE NO. (2 DIGITS)
D DESTINATION DRAWING NO.
S SOURCE DRAWING NO.



SELF CONTAINED VALVE & EQUIPMENT TAG NUMBERS

WWWW-DDDD-XNN-YY

W		FACILITY NUMBER
D	ARV	AIR RELEASE VALVE
	AVRV	AIR AND VACUUM RELEASE VALVE
	E	EJECTOR
	G	GATE
	M	MECHANICAL EQUIPMENT
	P	PUMP
	T	TANK
X		UNIT PROCESS NUMBER
N		UNIT NUMBER
Y		LOOP NUMBER

ABBREVIATIONS & LETTER SYMBOLS

AC	ALTERNATING CURRENT
AM	AUTO-MANUAL
CAM	COMPUTER-AUTO-MANUAL
CCS	CENTRAL CONTROL SYSTEM
CL_2 etc.	CHLORINE (TYPICAL: USE STANDARD CHEMICAL ELEMENT ABBREVIATIONS)
CM	COMPUTER-MANUAL
COD	CHEMICAL OXYGEN DEMAND
CP-X	CONTROL PANEL NO. X
DC	DIRECT CURRENT
DCS	DISTRIBUTED CONTROL SYSTEM
DCU	DISTRIBUTED CONTROL UNIT
DO	DISSOLVED OXYGEN
FCL_2	FREE CHLORINE RESIDUAL
FOS	FAST-OFF-SLOW
FOSA	FAST-OFF-SLOW-AUTO
FOSR	FAST-OFF-SLOW-REMOTE
FP-W-X	FIELD PANEL NO. WX (W=UNIT PROCESS NUMBER X=PANEL NUMBER)
FR	FORWARD-REVERSE
HOA	HAND-OFF-AUTO
HOR	HAND-OFF-REMOTE
ISR	INTRINSICALLY SAFE RELAY
LEL	LOWER EXPLOSIVE LIMIT
LOS	LOCKOUT STOP
LR	LOCAL-REMOTE
MA	MANUAL-AUTO
MC	MODULATE-CLOSE
MCC-X	MOTOR CONTROL CENTER NO. X
MSC	MANUFACTURER SUPPLIED CABLE
OC	OPEN-CLOSE(D)
OCA	OPEN-CLOSE-AUTO
OCR	OPEN-CLOSE-REMOTE
OO	ON-OFF
OOA	ON-OFF-AUTO
OOR	ON-OFF-REMOTE
ORP	OXIDATION REDUCTION POTENTIAL
OSC	OPEN-STOP-CLOSE
pH	HYDROGEN ION CONCENTRATION
PLC	PROGRAMMABLE LOGIC CONTROLLER
RIO	REMOTE I/O UNIT
RM-X	REMOTE MULTIPLEXING MODULE NO. X
RTU-X	REMOTE TELEMETRY UNIT NO. X
SF	SLOWER-FASTER
SS	START-STOP
SSC	SUPERVISORY SET POINT CONTROL
TCL_2	TOTAL CHLORINE RESIDUAL
TOC	TOTAL ORGANIC CARBON
TOD	TOTAL OXYGEN DEMAND
TURB	TURBIDITY
VHC	VOLATILE HYDROCARBONS
VIB	VIBRATION
$\triangle$	DIFFERENCE
Σ	SUM
$\times$	MULTIPLY
$\div$	DIVIDE
F(X)	CHARACTERIZED
X^n	RAISED TO THE Nth POWER
$\sqrt{\ }$	SQUARE ROOT
AVG	AVERAGE
1:1	REPEAT OR BOOST
>	SELECT HIGHEST SIGNAL
<	SELECT LOWEST SIGNAL
}	BIAS
%	GAIN OR ATTENUATE

GENERAL NOTES

1. COMPONENTS AND PANELS SHOWN WITH A SINGLE ASTERISK (✳) ARE TO BE PROVIDED AS PART OF A PACKAGE SYSTEM.
2. COMPONENTS AND PANELS SHOWN WITH A DOUBLE ASTERISK (✳✳) ARE TO BE PROVIDED UNDER DIVISION 16, ELECTRICAL.
3. THIS IS A STANDARD LEGEND. THEREFORE, NOT ALL OF THIS INFORMATION MAY BE USED ON THE PROJECT.

REV	DATE	BY	CHK.	APPR.	DESCRIPTION

DESIGNED BY: D. JOHNSON
DRAWN BY: E. GARCIA
CHECKED BY: M. JOHNSON
IN CHARGE: P. RUDE
DATE: 02-02-2024

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Sites

SITES RESERVOIR

DUNNIGAN PIPELINE
GENERAL
INSTRUMENTATION AND CONTROLS
LEGEND 1

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING. ADJUST SCALES FOR REDUCED PLOTS
0 1"

DRAWING NO.
DNP-0001-G-0701
SHT 13 OF 55

PRELIMINARY - NOT FOR CONSTRUCTION

Plot Date: 1/17/2024 6:16 AM
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VALVE SYMBOLS

GATE
KNIFE GATE
BUTTERFLY
GLOBE
BALL
VEE-BALL
PLUG
SEAT PORT ECCENTRIC PLUG
DIAPHRAGM
SLEEVE
PINCH
NEEDLE
SWING CHECK
BALL CHECK
FLOW DIRECTION
CENTER-GUIDED OR NOZZLE CHECK
BACKFLOW PREVENTER
ROTARY
TELESCOPE
SAMPLE
MUD
PRESSURE RELIEF
AIR AND/OR VACUUM RELEASE
REGULATED SIDE PRESSURE CONTROL
PRESSURE REGULATION (CLAY-TYPE)
MULTI-PORT VALVE (GATE VALVE SHOWN. FOR OTHER VALVE TYPES, APPROPRIATE VALVE SYMBOL SHOWN.) SEAT PORTS ARE IMPLIED BY INDICATED FLOW PATTERN.
ANGLE GATE

GATE SYMBOLS

SLUICE
BUTTERFLY
FABRICATED SLIDE
FLAP
STOP LOG
SHEAR
LANGEMANN

ACTUATOR SYMBOLS

PNEUMATIC DIAPHRAGM SPRING-OPPOSED, SINGLE OR DOUBLE ACTING
PNEUMATIC CYLINDER SINGLE OR DOUBLE ACTING ACTUATED BY ONE INPUT
ELECTRIC MOTOR
SOLENOID
VALVE POSITIONER
HYDRAULIC
DIAPHRAGM, DIFFERENTIAL PRESSURE
ELECTROHYDRAULIC
MANUAL

NOTE:
ON LOSS OF PRIMARY POWER (PNEUMATIC, ELECTRICAL, OR HYDRAULIC)

XX: FO FAIL OPEN
FC FAIL CLOSED
FLP FAIL TO LAST POSITION

PRIMARY ELEMENT SYMBOLS

PARSHALL FLUME
WEIR
ORFICE PLATE
FLOW TUBE
PITOT-STATIC
VORTEX METER
ULTRASONIC FLOWMETER
ELECTROMAGNETIC FLOWMETER
PROPELLER OR TURBINE METER
THERMAL FLOWMETER
LEVEL (BUBBLER TUBE)
LEVEL (FLOAT)
ROTAMETER
DENSITY METER
GENERIC
LEVEL

MISCELLANEOUS SYMBOLS

VENT TO ATMOSPHERE
AIR GAP
DRIP TRAP
PIG INSERT POINT
PIG CATCH POINT
SELF CONTAINED AIR SUPPLY
AIR PURGE SET
FLUSHING CONNECTION
SEAL WATER SET
WATER PURGE SET
FLEXIBLE CONNECTION
AERATOR
DIAPHRAGM SEAL
ANNULAR DIAPHRAGM SEAL
COMPOSITE SAMPLER
FLAME TRAP
CALIBRATION COLUMN
INLINE SILENCER
BLIND FLANGE
PIPE CAP
STRAINER
BASKET STRAINER
FILTER
PULSATION DAMPENER
EXPANSION CHAMBER

PANEL OUTLINE
FFLCPLLLX
PANEL CONTINUED ON SAME OR OTHER DRAWING
PANEL NAME
120V — 120 VOLT, 60 HZ POWER
480V — 480 VOLT, 60 HZ POWER
XX — AIR SET XX = SUPPLY PRESSURE IN PSIG.
PLUG
RECEPTACLE
RUPTURE DISK (VACUUM)
RUPTURE DISK (PRESSURE)
A, B → AND → C — LOGIC ELEMENT: IF A AND NOT B THEN C
A, B → OR → C — LOGIC ELEMENT: IF A OR B THEN C
I — INTERLOCK, SEE CONTROL DIAGRAMS
OR
VOICE COMMUNICATION POINT
SKIMMING MECHANISM
SCREW CONVEYOR
MIXER
ELECTRIC MOTOR
MUFFLER

PUMP AND COMPRESSOR SYMBOLS

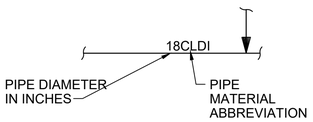
CENTRIFUGAL PUMP (DRY PIT)
CENTRIFUGAL WET PIT PUMP OR TURBINE PUMP
RECIPROCATING OR METERING PUMP (POSITIVE DISPLACEMENT)
DIAPHRAGM PUMP
GEAR PUMP OR BLOWER (POSITIVE DISPLACEMENT)
XX:
AS ADJUSTABLE SPEED
CS CONSTANT SPEED (SINGLE SPEED)
CS-2 CONSTANT SPEED (TWO SPEED)
PROGESSING CAVITY PUMP
ROTARY SCREW COMPRESSOR
COMPRESSOR (CENTRIFUGAL)
COMPRESSOR (PISTON)
BLOWER OR FAN (CENTRIFUGAL)
EJECTOR
PISTON PUMP
SUBMERSIBLE SUMP PUMP
ROTARY PUMP
VACUUM PUMP
SCREW PUMP
TURBINE GENERATOR

SCADA COMPONENT SYMBOLS

FO — FIBER OPTIC CABLE OVERHEAD
FO — FIBER OPTIC CABLE BURIED
RADIO CONNECTION
RADIO ANTENNA OMNI
RADIO ANTENNA YAGI
PLC CHASSIS
SECURITY CAMERA
FIREWALL
SWITCH, CORE RACK MOUNT
SWITCH RACK MOUNT
SWITCH, DIN RAIL MOUNT
SERVER
WORKSTATION
MONITOR WALL MOUNT
MONITOR DESK MOUNT
PRINTER
NETWORK ATTACHED STORAGE

LINE SIZE AND MATERIAL IDENTIFICATION

(FOR REFERENCE ONLY. SEE SITE AND MECHANICAL DRAWINGS)



CISP	CAST IRON SOIL PIPE
CLDI	CEMENT LINED DUCTILE IRON
CLSTL	CEMENT LINED STEEL
CU	COPPER
FRP	FIBERGLASS REINFORCED PLASTIC
PVC	POLYVINYL CHLORIDE
SST	STAINLESS STEEL
STL	STEEL

FLOW STREAM IDENTIFICATION

AHP	HIGH PRESSURE AIR
BCWD	BEARING COOLING WATER DRAIN
BCWS	BEARING COOLING WATER SUPPLY
CWS	COOLING WATER SUPPLY
CWR	COOLING WATER RETURN
DR	DRAIN
FP	FIRE PROTECTION
GD	GENERATOR DRAIN
PD	PENSTOCK DRAIN
RW	RAW WATER
SSWD	SHAFT SEAL WATER DRAIN
SSWS	SHAFT SEAL WATER SUPPLY
SW	SERVICE WATER

REV	DATE	BY	CHK.	APPR.	DESCRIPTION

DESIGNED BY: D. JOHNSON
DRAWN BY: E. GARCIA
CHECKED BY: M. JOHNSON
IN CHARGE: P. RUDE
DATE: 02-02-2024

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SITES RESERVOIR

DUNNIGAN PIPELINE
GENERAL
INSTRUMENTATION AND CONTROLS
LEGEND 2

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 — 1"

DRAWING NO.
DNP-0001-G-0702
SHT 14 OF 55

PRELIMINARY - NOT FOR CONSTRUCTION

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SACRAMENTO RIVER

SACRAMENTO RIVER

TCCA RED BLUFF PUMPING PLANT

TCCA RED BANK CREEK SIPHON

GCID HAMILTON CITY PUMPING PLANT

GCID STONEY CREEK SIPHON

5-200 CFS

ENVIRONMENTAL WATER PIPELINE DISSIPATION STRUCTURE

FUNKS CREEK

ENVRONMENTAL WATER PIPELINE 42" ID

T-C CANAL 2,100 CFS

GCID MAIN CANAL 1,800 CFS

CHECK STRUCTURE

SITES RESERVOIR HGL EL (FT) 500± MAX 340± MIN

SITES I/O TUNNEL 222" ID

MAXWELL INTERTIE

TRR PIPELINES (2) - 144" ID

INLET/ OUTLET WORKS

CONNECTION MANIFOLD

VALVE VAULT

FLOW METER VAULT

300-1,800 CFS

TERMINAL REGULATING RESERVOIR (TRR)

HGL EL (FT)

124± MAX

113± MIN

RELEASE FLOW: 900 CFS
PUMPED STORAGE FLOW: 1,200 CFS

900 CFS
450 CFS
IN EACH PIPE

CHECK STRUCTURE

300-2,100 CFS

FUNKS RESERVOIR

HGL EL (FT)

205± MAX

198± MIN

RELEASE FLOW: 1,000 CFS
PUMPED STORAGE FLOW: 2,400 CFS

1,000 CFS

FUNKS EMERGENCY DRAWDOWN CONDITIONS ONLY: 8,200 CFS TOTAL
4,100 CFS IN EACH PIPE, NOTE 1

FUNKS PIPELINES (2) - 144" ID

T-C CANAL

T-C CANAL

TERMINAL REGULATING RESERVOIR PUMPING AND GENERATING PLANT AND ENERGY DISSIPATION STRUCTURE

GCID MAIN CANAL

900 CFS

FUNKS RESERVOIR PUMPING AND GENERATING PLANT AND EMERGENCY DISSIPATION STRUCTURE

1,000 CFS

T-C CANAL

DUNNIGAN PIPELINE 126" ID

100 TO 1,000 CFS

COLUSA BASIN DRAIN

T-C CANAL INLET STRUCTURE

COLUSA BASIN DRAIN DISCHARGE STRUCTURE

TO SACRAMENTO RIVER

LEGEND:

- Q FLOW MEASUREMENT
- P PUMPING PLANT
- G GENERATING PLANT
- E ENERGY DISSIPATION STRUCTURE, EMERGENCY DISSIPATION STRUCTURE

NOTE:

1. FLOWS SHOWN FOR EMERGENCY DRAWDOWN CONDITIONS ARE PRELIMINARY AND SUBJECT TO CHANGE.

REV	DATE	BY	CHK.	APPR.	DESCRIPTION

DESIGNED BY: K. PARIS
DRAWN BY: R. STEED
CHECKED BY: W. OHLIN
IN CHARGE: P. RUDE
DATE: 02-02-2024

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DUNNIGAN PIPELINE GENERAL PROCESS FLOW DIAGRAM

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

DRAWING NO.
DNP-0001-G-0801
SHT 15 OF 55

PRELIMINARY - NOT FOR CONSTRUCTION

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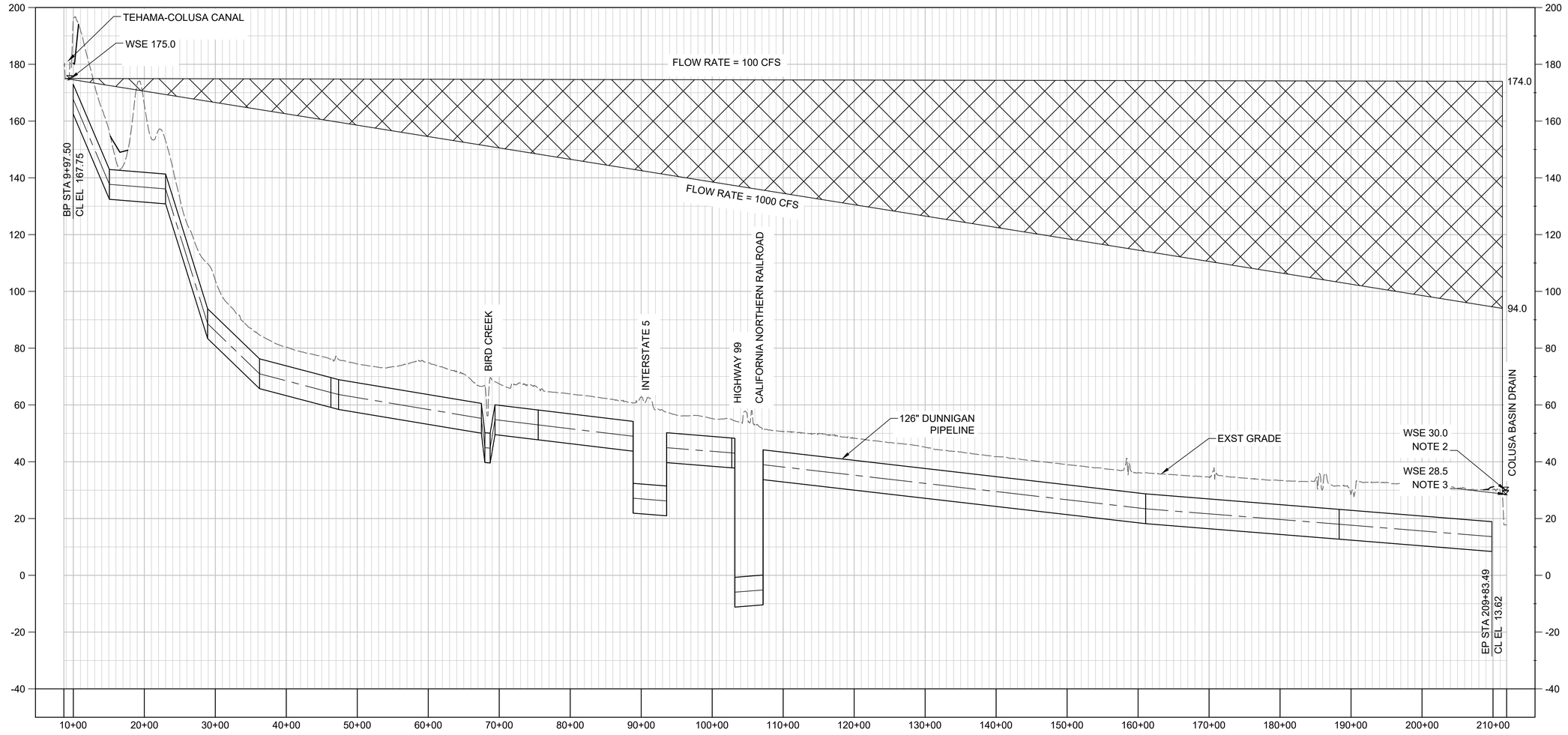

PROFILE
HORIZ SCALE: 1" = 800'
VERT SCALE: 1" = 20'

0 800' 1600'
0 20' 40'
VERT SCALE: 1"=20'

GENERAL NOTES

1. HYDRAULIC GRADE LINES SHOWN ARE BASED ON OLD PIPE ROUGHNESS VALUES.
2. WSE BASED ON 100-YEAR FLOOD.
3. EXISTING COLUSA BASIN DRAIN WET WATER YEAR MAX WSE.

SHEET KEY NOTES

KEY MAP

REV	DATE	BY	CHK.	APPR.	DESCRIPTION

DESIGNED BY: J. BLUM
DRAWN BY: E. HADIDI
CHECKED BY: W. OHLIN
IN CHARGE: P. RUDE
DATE: 02-02-2024

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SITES RESERVOIR

DUNNIGAN PIPELINE
GENERAL
HYDRAULIC PROFILE
DUNNIGAN PIPELINE

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

DRAWING NO.
DNP-0001-G-1001
SHT 16 OF 55

PRELIMINARY - NOT FOR CONSTRUCTION

Plot Date: 2/1/2024 4:12 PM
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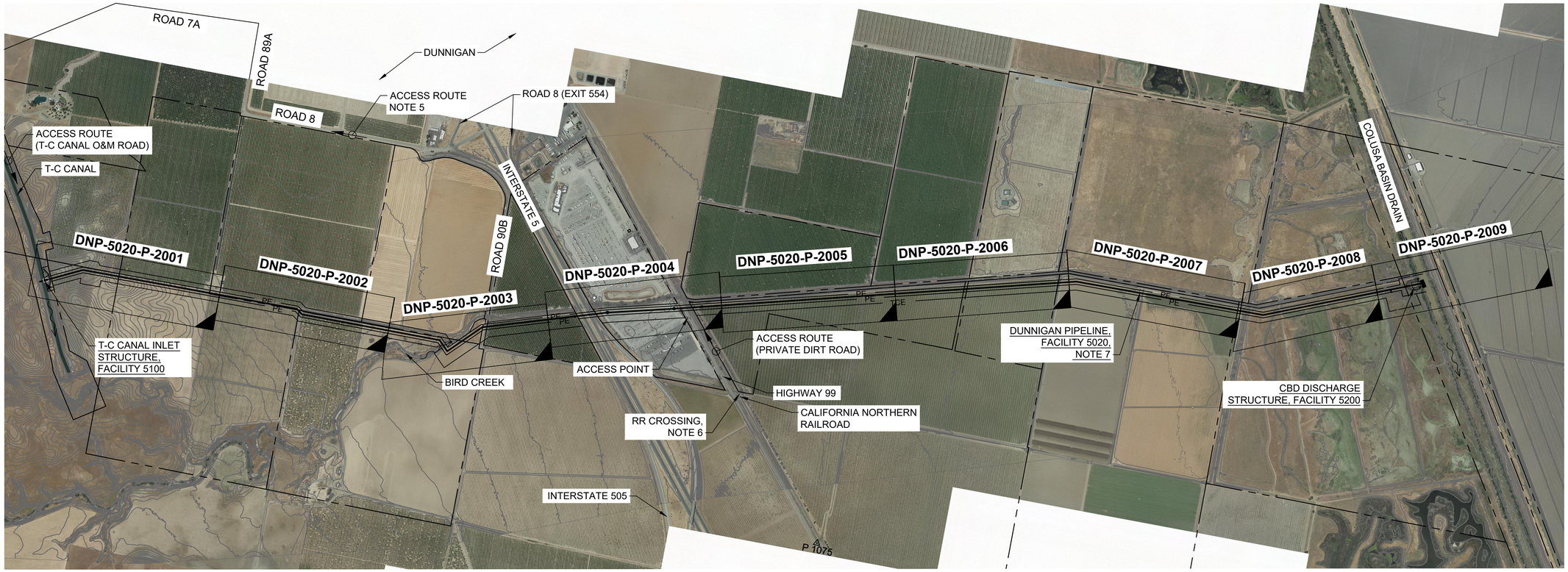


KEY PLAN
HORIZ SCALE: 1" = 800'

0 800' 1600'
1" = 800'
N

GENERAL NOTES

1. AERIAL PHOTOGRAPHY WAS FLOWN ON JUNE 6, 2022 BY GEOTERRA, INC. AND WAS DELIVERED TO JACOBS IN SEPTEMBER 2022.
2. HORIZONTAL DATUM: 2011 REALIZATION OF THE NORTH AMERICAN DATUM OF 1983(NAD83(2011)), EPOCH 2017.50. MAPPING PROJECTION IS US STATE PLANES COORDINATES, CALIFORNIA ZONE 2, SURVEY FEET.
3. VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88), GEOID18.
4. SITES PROJECT JOINT POWERS AUTHORITY GPS CONTROL NETWORK ESTABLISHED IN JANUARY 2023 RECORD OF SURVEY IS RECORDED WITH YOLO COUNTY RECORDS, DOCUMENT NUMBER 2023-0157, BOOK 2023 OF MAPS, PAGES 22-23 AND WAS FILED JULY 13, 2023.
5. ACCESS TO FACILITY 5100: FROM INTERSTATE 5, TRAVEL WEST ON ROAD 8, TURN NORTH ON ROAD 89A, TURN WEST ON ROAD 7A, AND SOUTH ON THE T-C CANAL O&M ROAD (EAST SIDE OF CANAL).
6. ACCESS TO FACILITY 5200: FROM INTERSTATE 5, TRAVEL EAST ON ROAD 8, TURN SOUTH ON HIGHWAY 99, AND EAST AT THE CALIFORNIA NORTHERN RAILROAD CROSSING. CONTINUE TO FACILITIES ON ACCESS ROUTE SHOWN.
7. ACCESS TO FACILITY 5020: FROM COUNTY ROADS AND ACCESS ROUTES SHOWN.

SHEET KEY NOTES

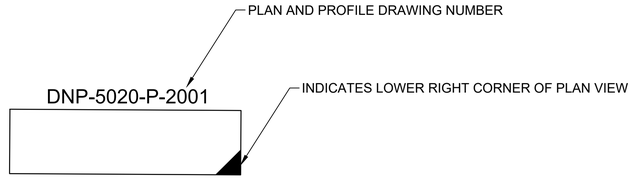
KEY MAP

DUNNIGAN PIPELINE HORIZONTAL ALIGNMENT DATA

POINT TYPE	STA	NORTHING	EASTING	DISTANCE TO NEXT	BEARING TO NEXT POINT
BP	9+97.50	2072197.05	6569095.18	510.51	N 64° 13' 56" E
PI	15+08.02	2072418.98	6569554.93	3120.15	N 89° 42' 49" E
PI	46+28.17	2072434.57	6572675.04	108.33	S 53° 23' 35" E
PI	47+36.50	2072369.97	6572762.00	2011.40	N 90° 00' 00" E
PI	67+47.90	2072369.97	6574773.40	192.09	S 45° 00' 00" E
PI	69+40.00	2072234.14	6574909.23	608.53	N 45° 00' 00" E
PI	75+48.53	2072664.43	6575339.53	1809.62	N 72° 42' 56" E
PI	93+58.14	2073202.10	6577067.43	917.52	N 76° 00' 12" E
PI	102+75.67	2073424.02	6577957.71	5831.22	N 75° 32' 43" E
PI	161+06.89	2074879.58	6583604.34	2724.90	N 89° 32' 09" E
PI	188+31.79	2074901.66	6586329.15	2151.70	N 68° 06' 44" E
EP	209+83.49	2075703.79	6588325.75		

SURVEY CONTROL DATA

CONTROL POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
P265	1,954,906.23	6,574,773.97	130.68	CSRS CONTINUOUSLY OPERATING REFERENCE STATION
P276	1,998,114.69	6,820,091.06	778.25	CSRS CONTINUOUSLY OPERATING REFERENCE STATION
P271	2,001,341.88	6,643,182.51	42.39	CSRS CONTINUOUSLY OPERATING REFERENCE STATION
MNRC	2,082,142.86	6,435,619.75	2421.06	CSRS CONTINUOUSLY OPERATING REFERENCE STATION
P208	2,165,953.32	6,475,449.54	343.37	CSRS CONTINUOUSLY OPERATING REFERENCE STATION
P272	2,178,990.93	6,577,818.12	58.72	CSRS CONTINUOUSLY OPERATING REFERENCE STATION
ORVB	2,328,391.79	6,702,567.89	1206.74	CSRS CONTINUOUSLY OPERATING REFERENCE STATION
VINCOR	2,053,987.64	6,566,390.31	158.09	FD. NGS HEIGHT MODERNIZATION STATION - PID: DE9127
X 200 RESET	2,091,682.10	6,566,425.37	97.61	FD. NGS HEIGHT MODERNIZATION STATION - PID: JS2144
P 1075	2,070,501.47	6,580,632.04	48.36	FD. NGS HEIGHT MODERNIZATION STATION - PID: JS2130
T 849	2,049,629.53	6,585,707.54	118.22	FD. NGS HEIGHT MODERNIZATION STATION - PID: JS2177
HERSHEY	2,080,374.64	6,586,025.36	45.18	FD. NGS HEIGHT MODERNIZATION STATION - PID: AI5064



REV	DATE	BY	CHK.	APPR.	DESCRIPTION

DESIGNED BY: I. BARRIOS
DRAWN BY: E. HADIDI
CHECKED BY: B. MEMEO
IN CHARGE: P. RUDE
DATE: 02-02-2024

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Sites

SITES RESERVOIR

DUNNIGAN PIPELINE
PIPELINE
KEY PLAN, CONTROL AND ALIGNMENT DATA, AND SITE ACCESS

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

DRAWING NO.
DNP-5020-P-2000
SHT 19 OF 55

PRELIMINARY - NOT FOR CONSTRUCTION

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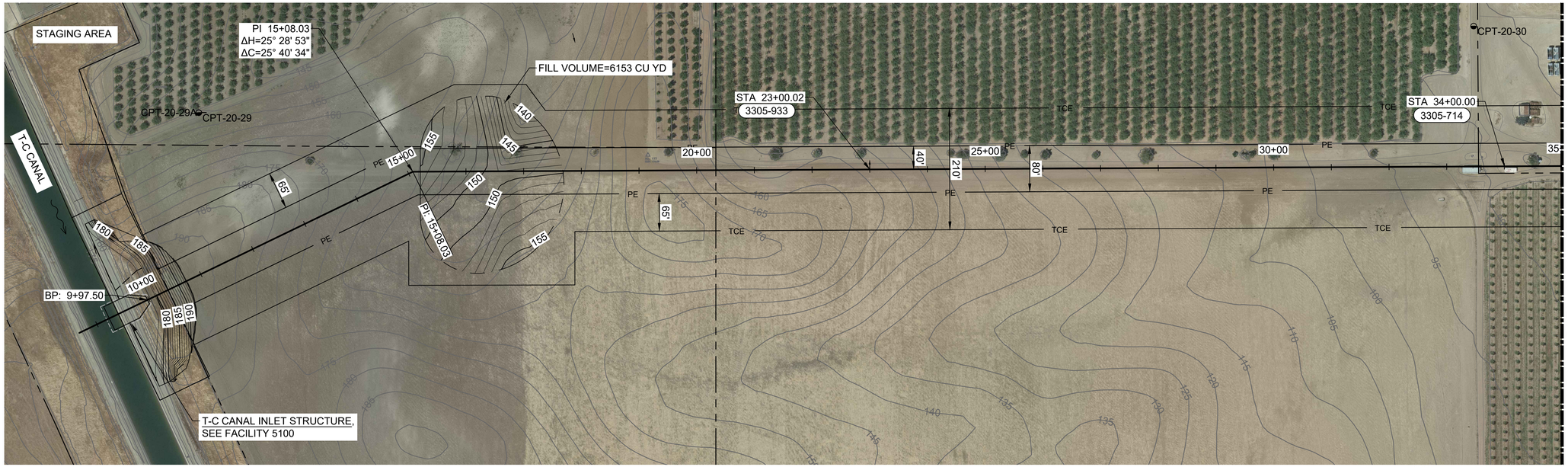


PLAN

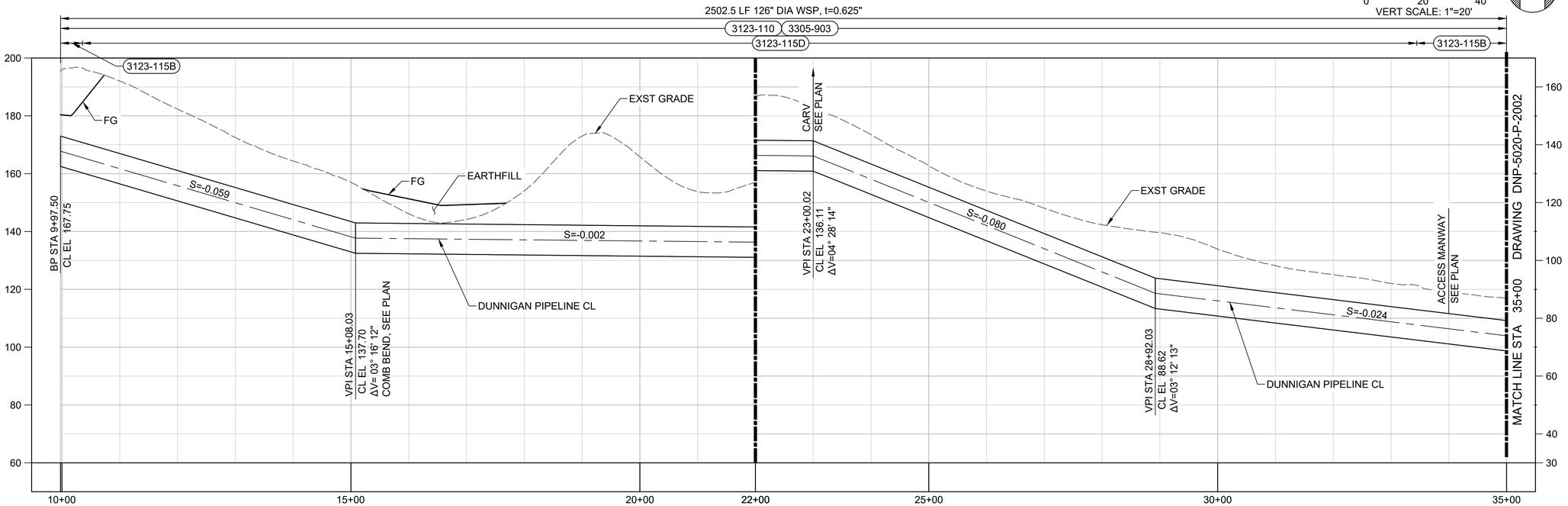
HORIZ SCALE: 1" = 100'

0 100' 200'

0 20' 40'

VERT SCALE: 1"=20'

N



PROFILE

HORIZ SCALE: 1" = 100'
VERT SCALE: 1" = 20'

GENERAL NOTES

SHEET KEY NOTES

KEY MAP

PRELIMINARY - NOT FOR CONSTRUCTION

REV	DATE	BY	CHK.	APPR.	DESCRIPTION

DESIGNED BY: I. BARRIOS
DRAWN BY: E. HADIDI
CHECKED BY: B. MEMEO
IN CHARGE: P. RUDE
DATE: 02-02-2024

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Sites

SITES RESERVOIR

DUNNIGAN PIPELINE
PIPELINE
PLAN AND PROFILE - STA 9+97.50 TO STA 35+00

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

DRAWING NO.
DNP-5020-P-2001
SHT 20 OF 55

Plot Date: 1/29/2024 10:20 PM File: C:\pwworking\hdr_sites_reservoir\dms01287\DNP-5020-P-2001.dwg
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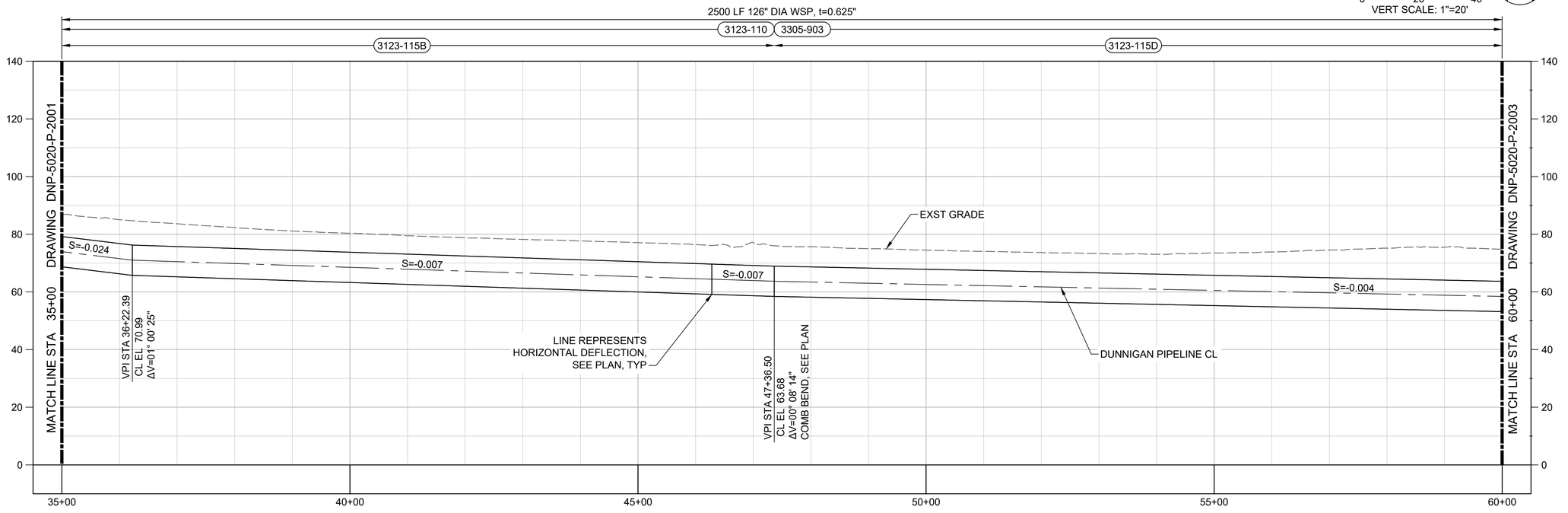
PLAN
HORIZ SCALE: 1" = 100'

0 100' 200'
0 20' 40'
VERT SCALE: 1"=20'



PROFILE
HORIZ SCALE: 1" = 100'
VERT SCALE: 1" = 20'

GENERAL NOTES

SHEET KEY NOTES

KEY MAP

REV	DATE	BY	CHK.	APPR.	DESCRIPTION

DESIGNED BY: I. BARRIOS
DRAWN BY: E. HADIDI
CHECKED BY: B. MEMEO
IN CHARGE: P. RUDE
DATE: 02-02-2024

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SITES RESERVOIR

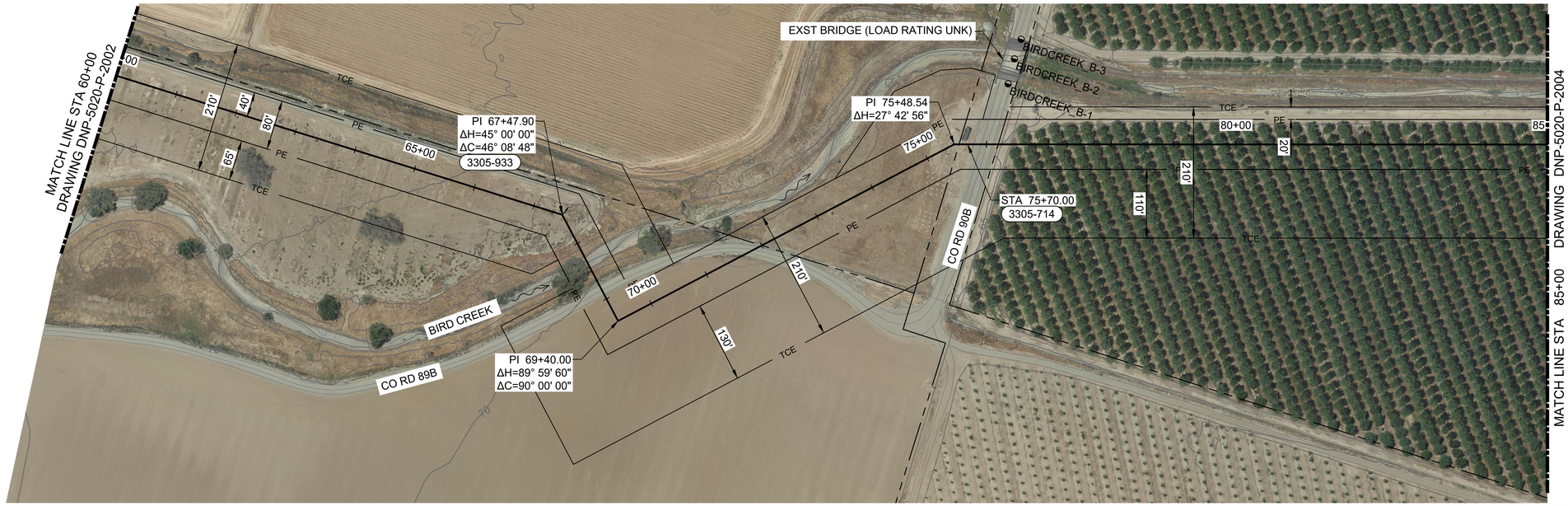
DUNNIGAN PIPELINE
PIPELINE
PLAN AND PROFILE - STA 35+00 TO 60+00

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

DRAWING NO.
DNP-5020-P-2002
SHT 21 OF 55

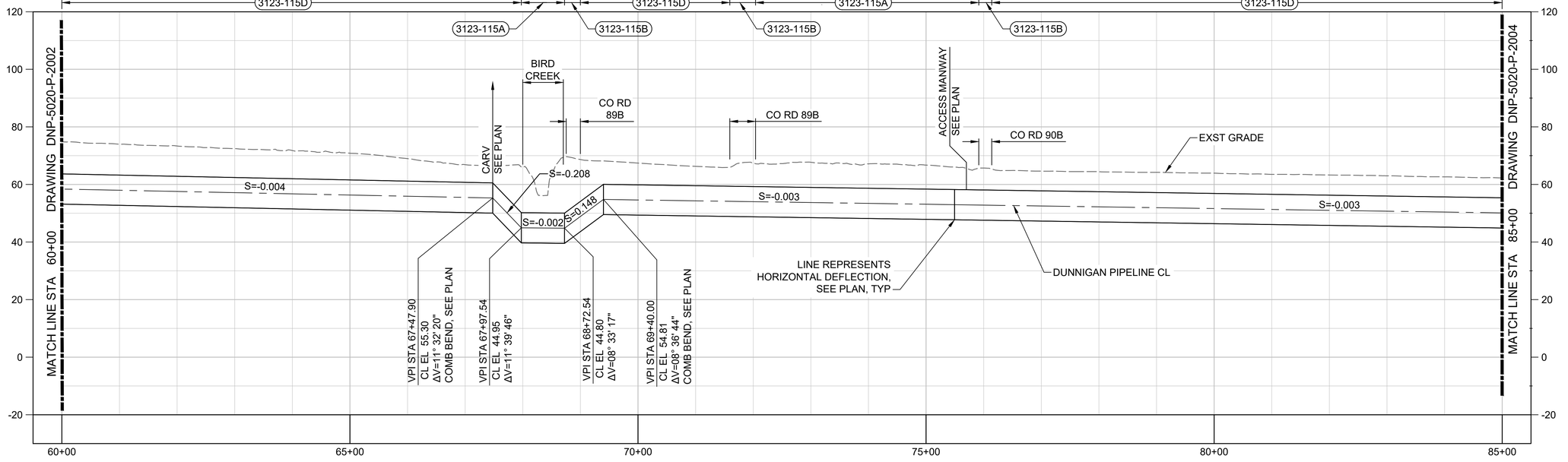
PRELIMINARY - NOT FOR CONSTRUCTION

Plot Date: 1/12/2024 3:01 PM
Saved By: HADIDE
File: C:\pwworking\hdr_sites_reservoir\dms01287\DNP-5020-P-2002.dwg



PLAN
HORIZ SCALE: 1" = 100'

0 100' 200'
HORIZ SCALE: 1" = 100'
0 20' 40'
VERT SCALE: 1"=20'



PROFILE
HORIZ SCALE: 1" = 100'
VERT SCALE: 1" = 20'

GENERAL NOTES

SHEET KEY NOTES

KEY MAP

PRELIMINARY - NOT FOR CONSTRUCTION

REV	DATE	BY	CHK.	APPR.	DESCRIPTION

DESIGNED BY: I. BARRIOS
DRAWN BY: E. HADIDI
CHECKED BY: B. MEMEO
IN CHARGE: P. RUDE
DATE: 02-02-2024

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Sites

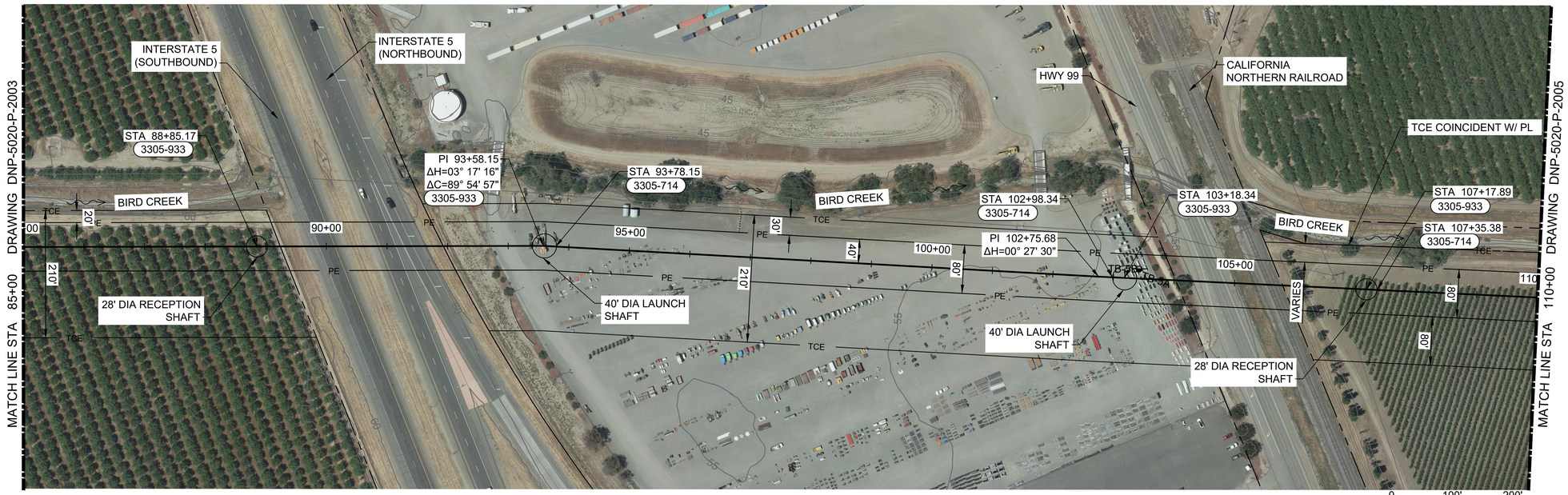
SITES RESERVOIR

DUNNIGAN PIPELINE
PIPELINE
PLAN AND PROFILE - STA 60+00 TO 85+00

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

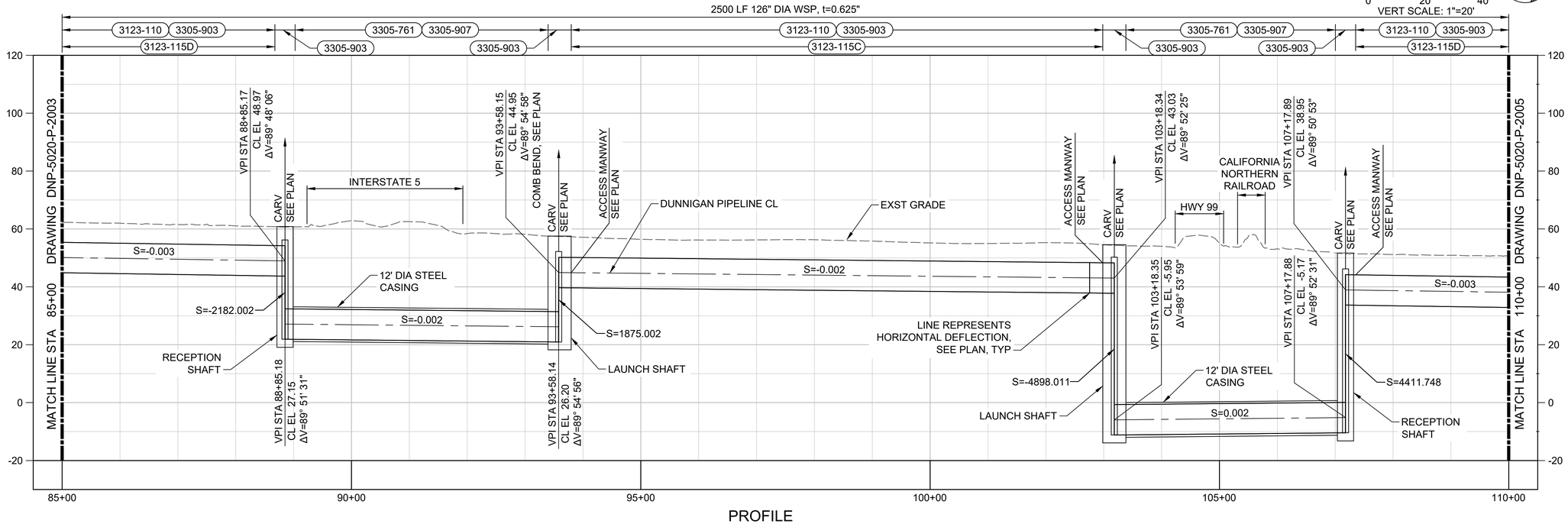
DRAWING NO.
DNP-5020-P-2003
SHT 22 OF 55

Plot Date: 1/29/2024 11:06 PM File: C:\pwworking\hdr_sites_reservoir\dms012871\DNP-5020-P-2003.dwg
Saved By: HADIDIE



PLAN
HORIZ SCALE: 1" = 100'

0 100' 200'
HORIZ SCALE: 1" = 100'
0 20' 40'
VERT SCALE: 1"=20'



PROFILE
HORIZ SCALE: 1" = 100'
VERT SCALE: 1" = 20'

GENERAL NOTES

SHEET KEY NOTES

KEY MAP

Plot Date: 1/31/2024 9:18 PM
Saved By: HADIDIE
File: C:\pwworking\hdr_sites_reservoir\dms012287\DNP-5020-P-2004.dwg

REV	DATE	BY	CHK.	APPR.	DESCRIPTION

DESIGNED BY: I. BARRIOS
DRAWN BY: E. HADIDI
CHECKED BY: B. MEMEO
IN CHARGE: P. RUDE
DATE: 02-02-2024

Jacobs
2525 AIRPARK DR
REDDING, CA 96001
(530) 243-5831

REGISTERED PROFESSIONAL ENGINEER
BRAD L. MEMEO
C81778
CALIFORNIA

Sites

SITES RESERVOIR

DUNNIGAN PIPELINE
PIPELINE
PLAN AND PROFILE - STA 85+00 TO 110+00

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

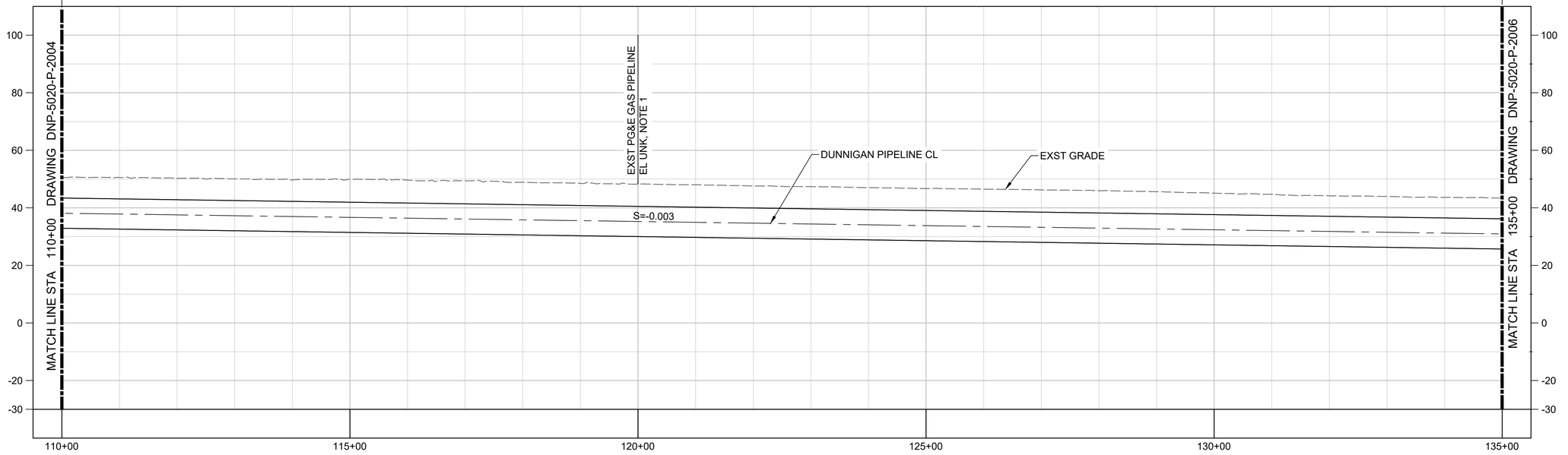
DRAWING NO.
DNP-5020-P-2004
SHT 23 OF 55

PRELIMINARY - NOT FOR CONSTRUCTION

PLAN
HORIZ SCALE: 1" = 100'

0 100' 200'
HORIZ SCALE: 1" = 100'
0 20' 40'
VERT SCALE: 1"=20'

2500 LF 126" DIA WSP, t=0.625"
3123-110 | 3305-903 | 3123-115D



PROFILE
HORIZ SCALE: 1" = 100'
VERT SCALE: 1" = 20'

GENERAL NOTES

1. EXST PG&E GAS PIPELINE SIZE, ELEVATION, AND LOCATION IS UNKNOWN. PIPELINE IS APPROXIMATED USING PUBLICLY AVAILABLE DATA.

SHEET KEY NOTES

KEY MAP

REV	DATE	BY	CHK.	APPR.	DESCRIPTION

DESIGNED BY: I. BARRIOS
DRAWN BY: E. HADIDI
CHECKED BY: B. MEMEO
IN CHARGE: P. RUDE
DATE: 02-02-2024

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ENGINEER
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Sites

SITES RESERVOIR

DUNNIGAN PIPELINE
PIPELINE
PLAN AND PROFILE - STA 110+00 TO 135+00

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING. ADJUST SCALES FOR REDUCED PLOTS
0 1"

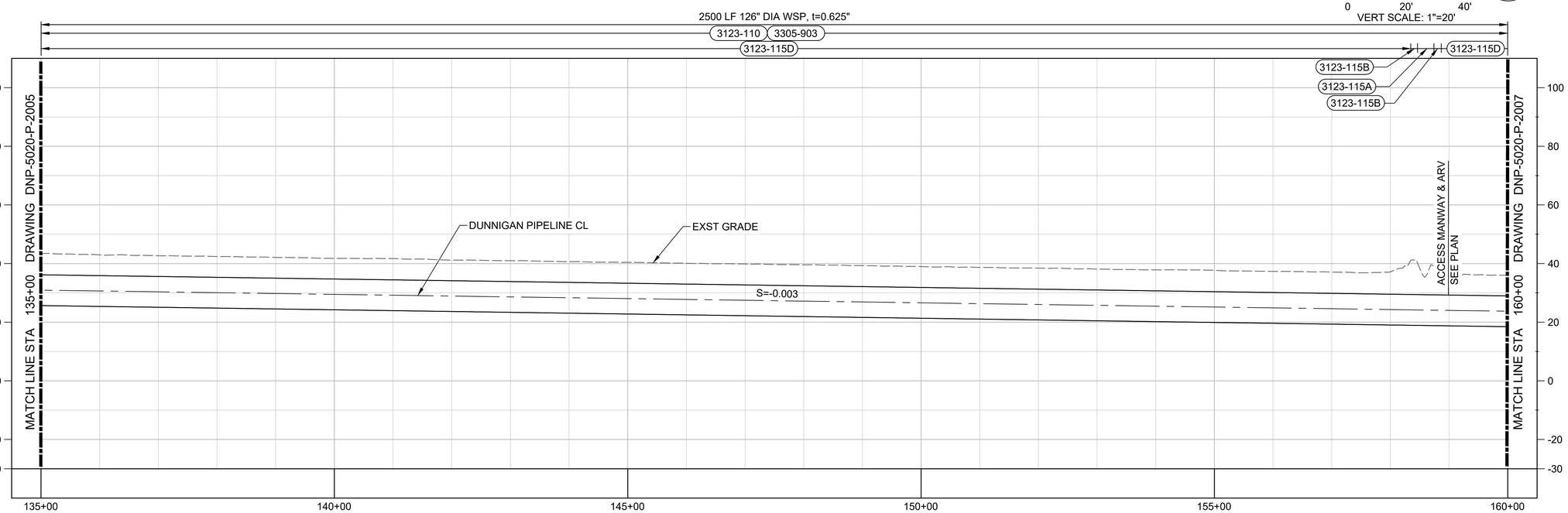
DRAWING NO.
DNP-5020-P-2005
SHT 24 OF 55

PRELIMINARY - NOT FOR CONSTRUCTION

Plot Date: 1/31/2024 9:28 PM
File: C:\pwworking\hdr_sites_reservoir\dms01287\DNP-5020-P-2005.dwg
Saved By: HADIDIE

PLAN
HORIZ SCALE: 1" = 100'

0 100' 200'
HORIZ SCALE: 1" = 100'
0 20' 40'
VERT SCALE: 1"=20'



PROFILE
HORIZ SCALE: 1" = 100'
VERT SCALE: 1" = 20'

GENERAL NOTES

SHEET KEY NOTES

KEY MAP

REV	DATE	BY	CHK.	APPR.	DESCRIPTION

DESIGNED BY: I. BARRIOS
DRAWN BY: E. HADIDI
CHECKED BY: B. MEMEO
IN CHARGE: P. RUDE
DATE: 02-02-2024

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ENGINEER
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Sites

SITES RESERVOIR

DUNNIGAN PIPELINE
PIPELINE
PLAN AND PROFILE - STA 135+00 TO 160+00

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING. ADJUST SCALES FOR REDUCED PLOTS
0 1"

DRAWING NO.
DNP-5020-P-2006
SHT 25 OF 55

PRELIMINARY - NOT FOR CONSTRUCTION

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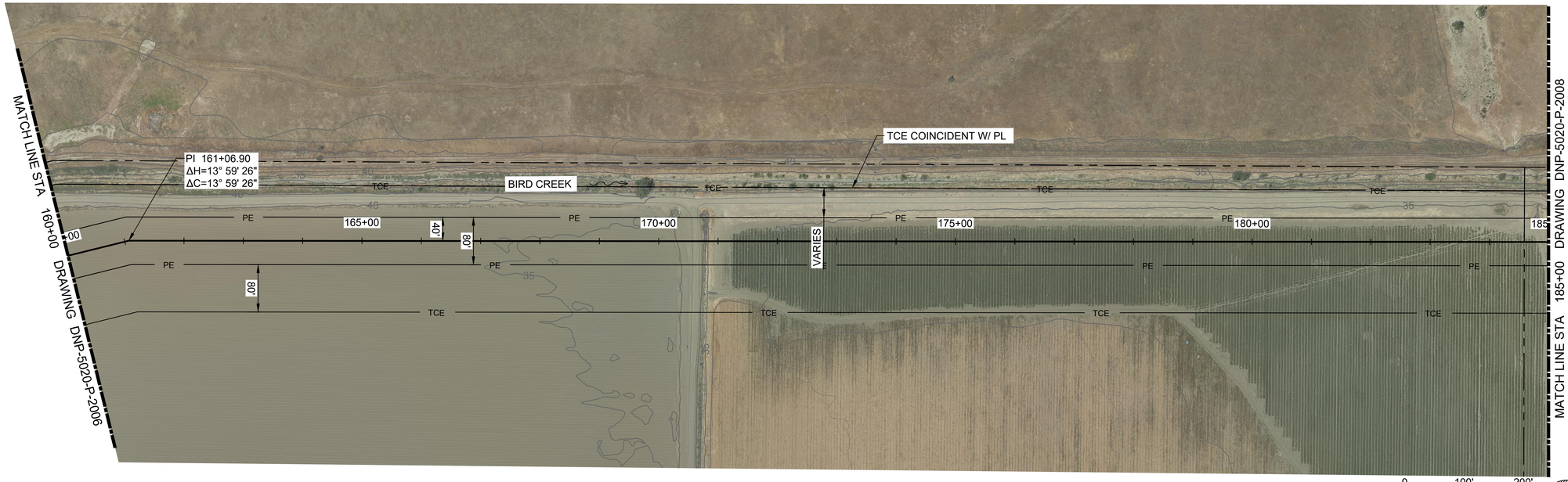
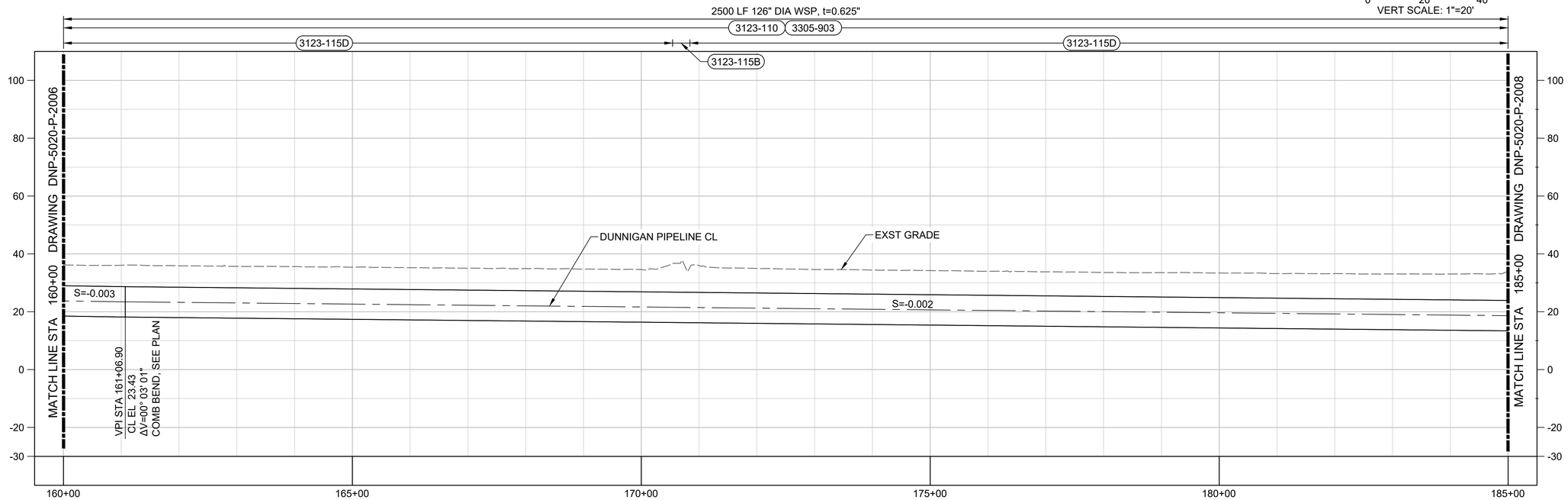
Saved By: HADIDIE



PLAN
HORIZ SCALE: 1" = 100'

0 100' 200'
HORIZ SCALE: 1" = 100'
0 20' 40'
VERT SCALE: 1"=20'



PROFILE
HORIZ SCALE: 1" = 100'
VERT SCALE: 1" = 20'

GENERAL NOTES

SHEET KEY NOTES

KEY MAP

PRELIMINARY - NOT FOR CONSTRUCTION

REV	DATE	BY	CHK.	APPR.	DESCRIPTION

DESIGNED BY: I. BARRIOS
DRAWN BY: E. HADIDI
CHECKED BY: B. MEMEO
IN CHARGE: P. RUDE
DATE: 02-02-2024

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REGISTERED
PROFESSIONAL
ENGINEER
BRAD L. MEMEO
C81778
CALIFORNIA

Sites

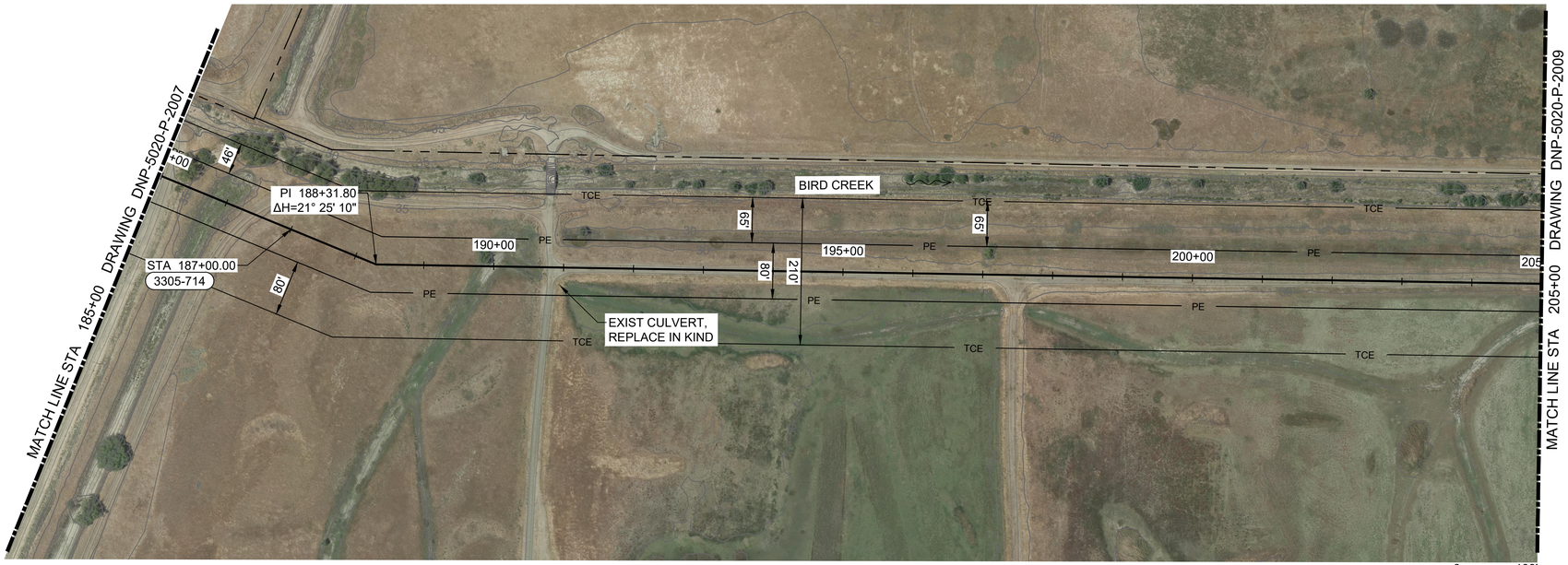
SITES RESERVOIR

DUNNIGAN PIPELINE
PIPELINE
PLAN AND PROFILE - STA 160+00 TO 185+00

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

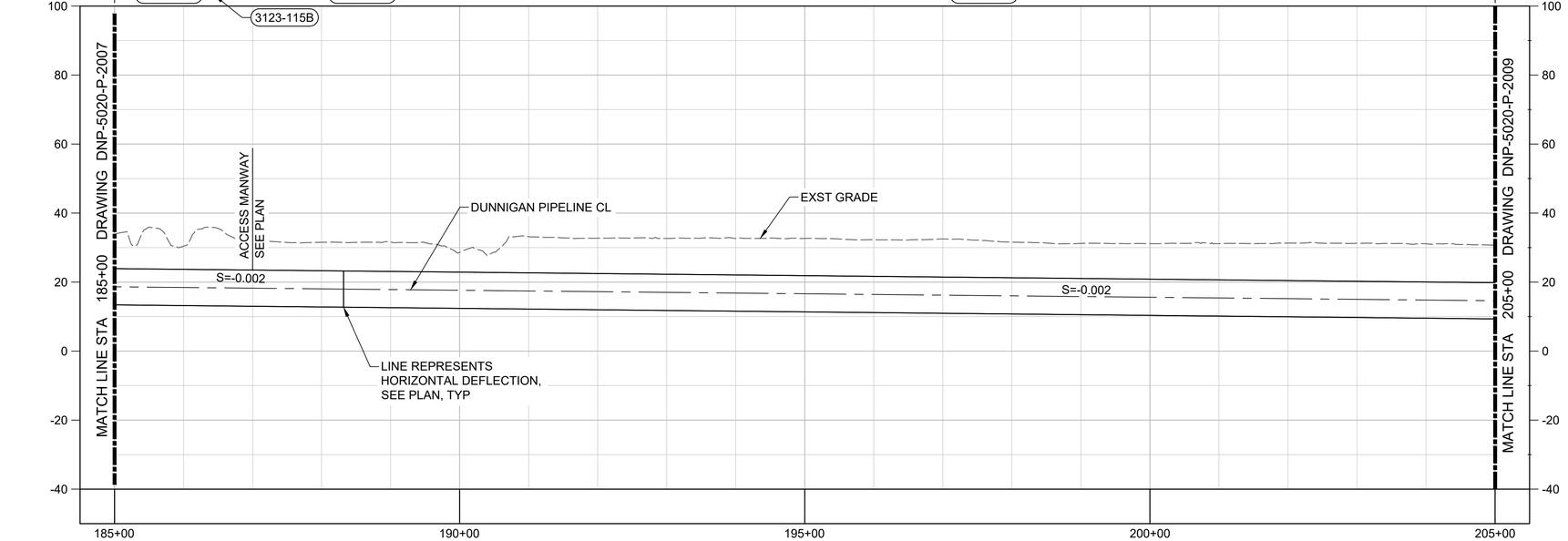
DRAWING NO.
DNP-5020-P-2007
SHT 26 OF 55

Plot Date: 1/31/2024 9:49 PM
Saved By: HADIDIE
File: C:\pwworking\hdr_sites_reservoir\dms01287\DNP-5020-P-2007.dwg



PLAN
HORIZ SCALE: 1" = 100'

0 100' 200'
HORIZ SCALE: 1" = 100'
0 20' 40'
VERT SCALE: 1"=20'



PROFILE
HORIZ SCALE: 1" = 100'
VERT SCALE: 1" = 20'

GENERAL NOTES

SHEET KEY NOTES

KEY MAP

PRELIMINARY - NOT FOR CONSTRUCTION

REV	DATE	BY	CHK.	APPR.	DESCRIPTION

DESIGNED BY: I. BARRIOS
DRAWN BY: E. HADIDI
CHECKED BY: B. MEMEO
IN CHARGE: P. RUDE
DATE: 02-02-2024

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Sites

SITES RESERVOIR

DUNNIGAN PIPELINE
PIPELINE
PLAN AND PROFILE - STA 185+00 to 205+00

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING. ADJUST SCALES FOR REDUCED PLOTS
0 1"

DRAWING NO.
DNP-5020-P-2008
SHT 27 OF 55

Plot Date: 1/30/2024 3:30 PM
Saved By: HADIDIE
File: C:\pwworking\hdr_sites_reservoir\dms01287\DNP-5020-P-2008.dwg

PLAN

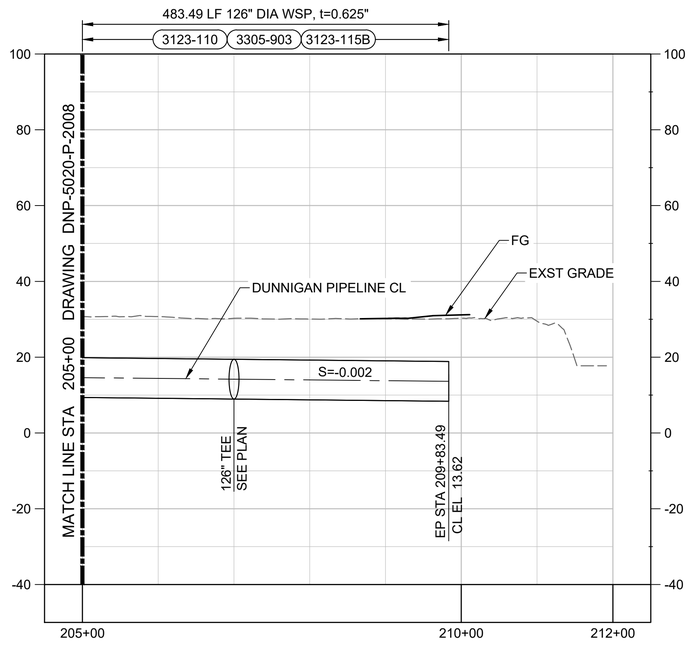
HORIZ SCALE: 1" = 100'

0 100' 200'

HORIZ SCALE: 1" = 100'

0 20' 40'

VERT SCALE: 1"=20'



PROFILE

HORIZ SCALE: 1" = 100'
VERT SCALE: 1" = 20'

GENERAL NOTES

SHEET KEY NOTES

KEY MAP

PRELIMINARY - NOT FOR CONSTRUCTION

REV	DATE	BY	CHK.	APPR.	DESCRIPTION

DESIGNED BY: I. BARRIOS
DRAWN BY: E. HADIDI
CHECKED BY: B. MEMEO
IN CHARGE: P. RUDE
DATE: 02-02-2024

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C81778
CALIFORNIA

Sites

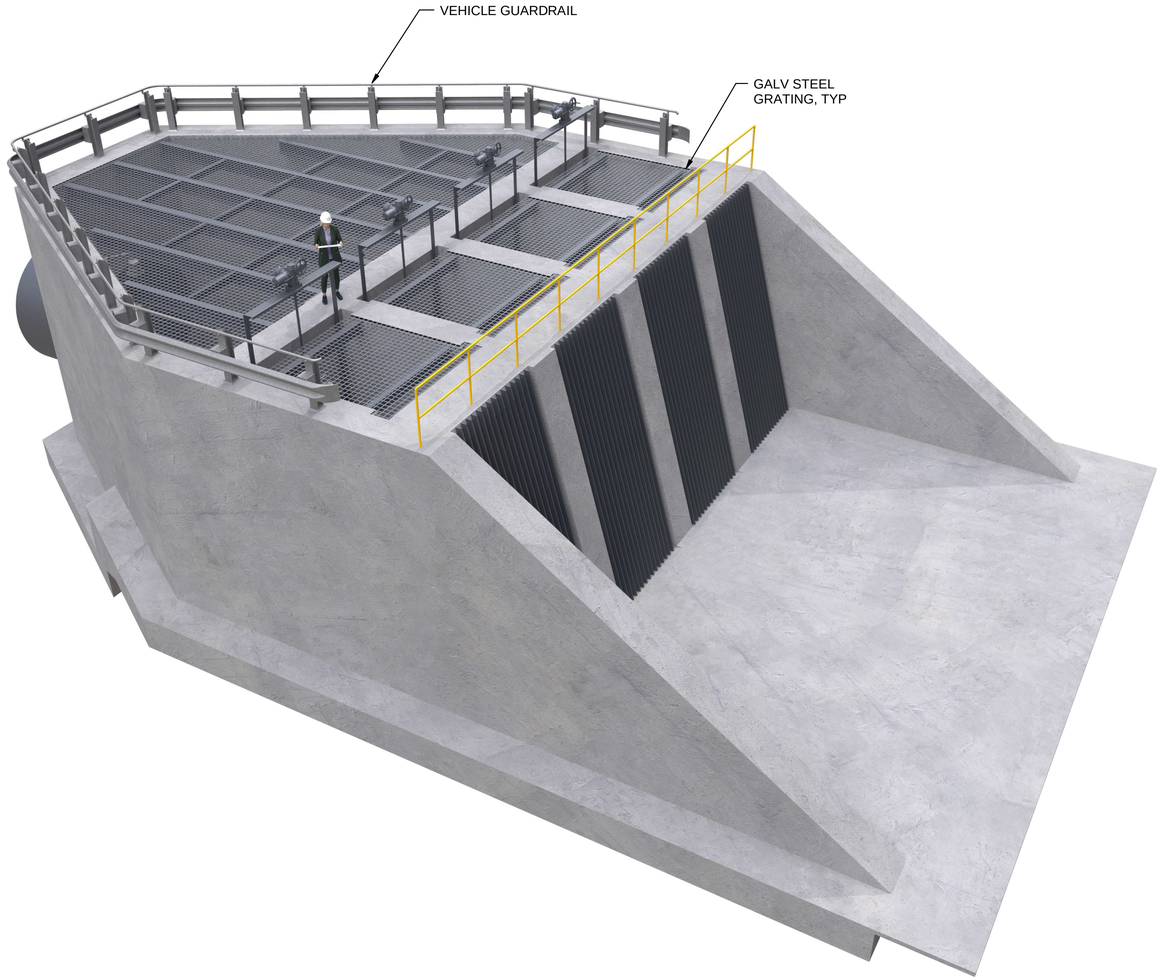
SITES RESERVOIR

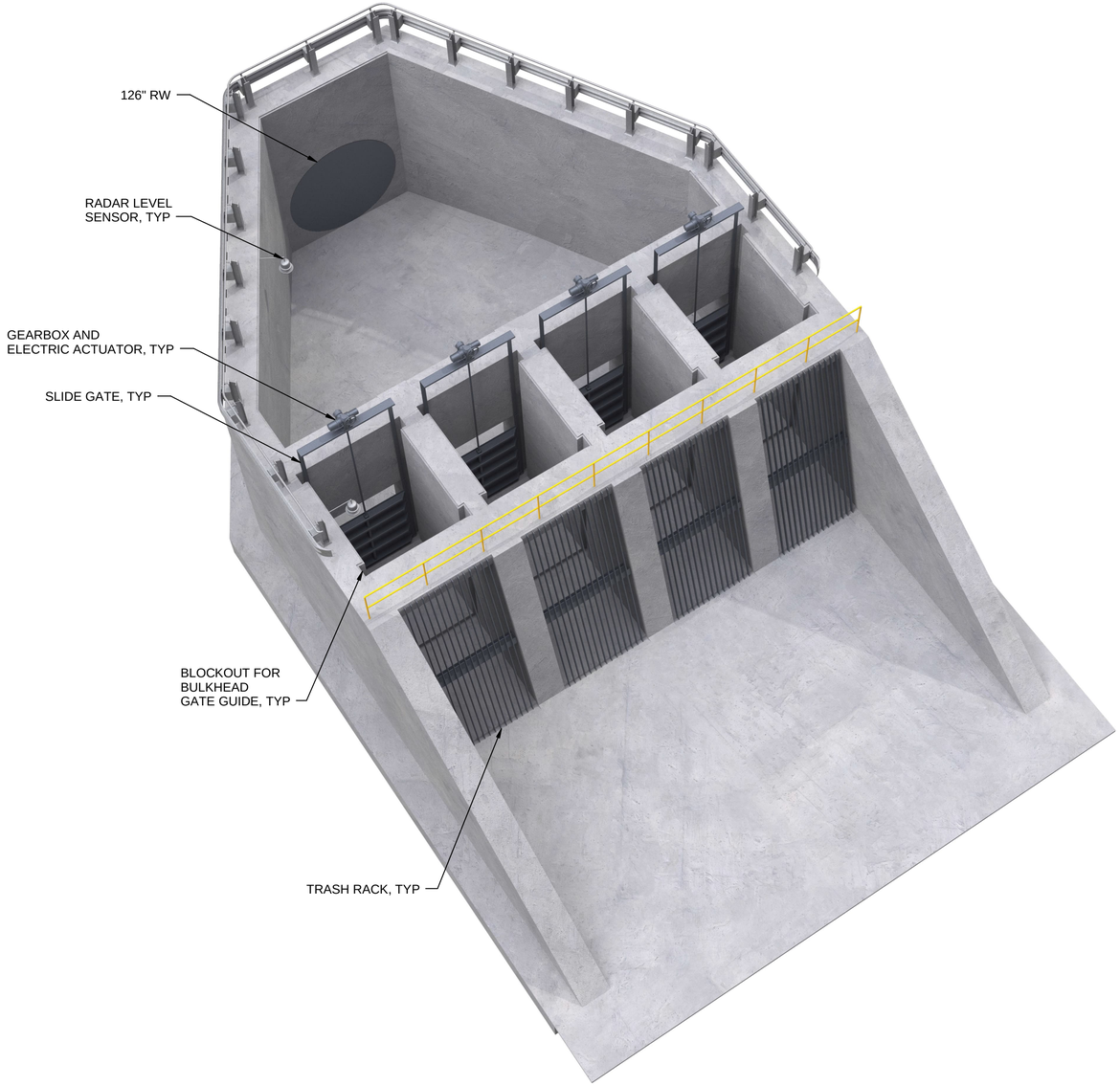
DUNNIGAN PIPELINE
PIPELINE
PLAN AND PROFILE - STA 205+00 TO 209+83.49

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

DRAWING NO.
DNP-5020-P-2009
SHT 28 OF 55

Plot Date: 1/31/2024 10:17 AM File: C:\pwworking\hdr_sites_reservoir\dms01287\DNP-5020-P-2009.dwg
Saved By: HADIDIE





REV	DATE	BY	CHK.	APPR.	DESCRIPTION

DESIGNED BY: I. BARRIOS
DRAWN BY: S. WAGONER
CHECKED BY: B. MEMEO
IN CHARGE: P. RUDE
DATE: 02-02-2024

Jacobs
2525 AIRPARK DR
REDDING, CA 96001
(530) 2435831

RENDERINGS ARE NOT CONSIDERED A DRAWING AS DEFINED IN THE GENERAL CONDITIONS AND ARE INCLUDED FOR REFERENCE ONLY

Sites

SITES RESERVOIR

DUNNIGAN PIPELINE
GENERAL
DUNNIGAN PIPELINE
T-C CANAL INLET STRUCTURE
RENDERING

VERIFY SCALES

BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS

0 1"

DRAWING NO.
DNP-5100-G-0001
SHT 29 OF 55

PRELIMINARY - NOT FOR CONSTRUCTION

BIM 360://10333221_Site Reservoir Project_2022/DNP-5100-G-z3Dn01.rvt
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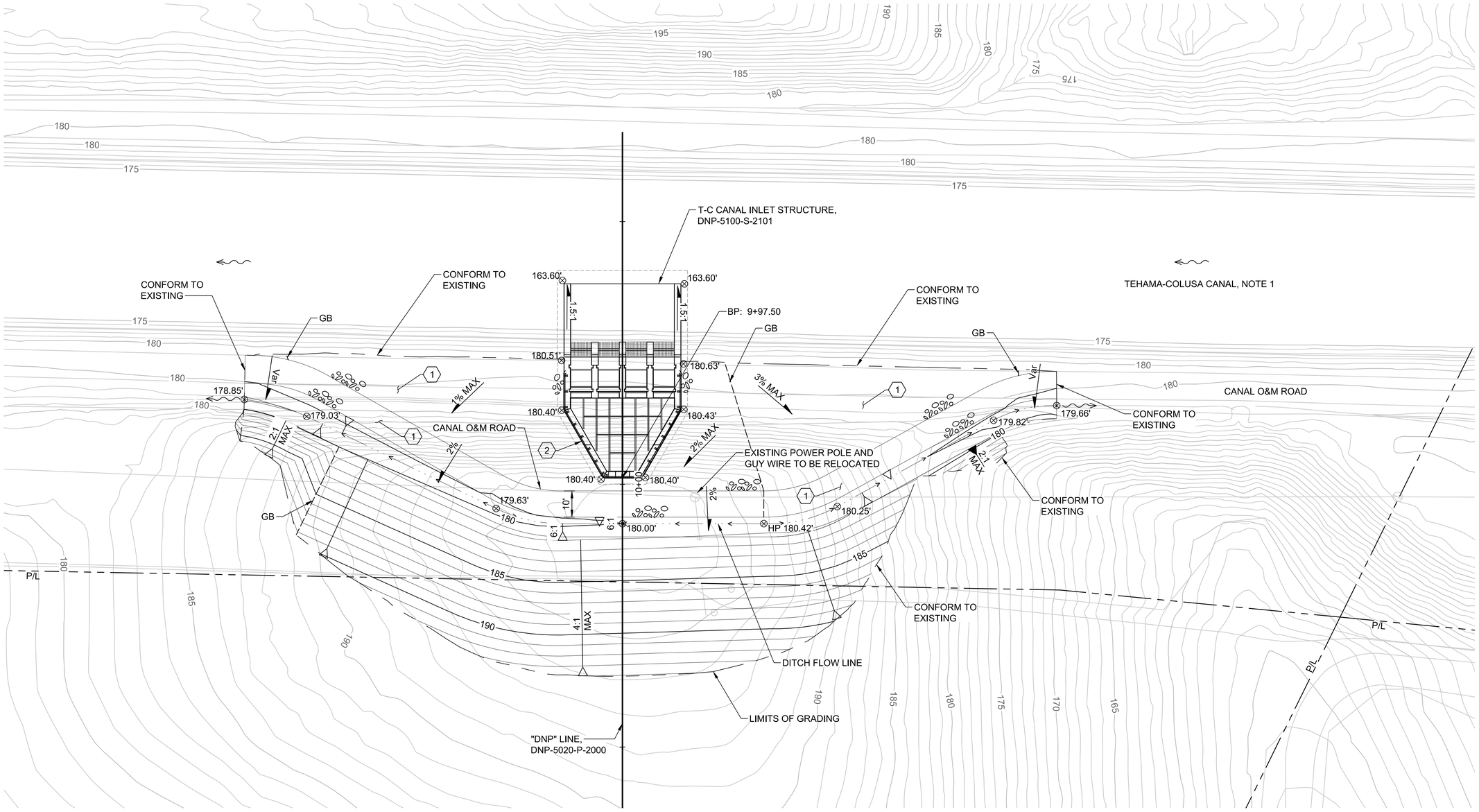

PLAN
HORIZ SCALE: 1"=20'

0 20' 40'

N

GENERAL NOTES

1. EXISTING T-C CANAL IS CONCRETE LINED CANAL

SHEET KEY NOTES

1. GRAVEL SURFACING (3215-260)
2. METAL BEAM GUARD RAIL WITH HANDRAIL. (3471-865)

REV	DATE	BY	CHK.	APPR.	DESCRIPTION

DESIGNED BY: M. SHAHIDI
DRAWN BY: M. SHAHIDI
CHECKED BY: A. KELLOGG
IN CHARGE: P. RUDE
DATE: 02-02-2024

Jacobs
2525 AIRPARK DR
REDDING, CA 96001
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REGISTERED PROFESSIONAL ENGINEER
ASHLEY KELLOGG
76561
CALIFORNIA

Sites

SITES RESERVOIR

DUNNIGAN PIPELINE
CIVIL
DUNNIGAN PIPELINE
T-C CANAL INLET STRUCTURE
SITE PLAN

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING. ADJUST SCALES FOR REDUCED PLOTS
0 1"

DRAWING NO.
DNP-5100-C-2001
SHT 30 OF 55

PRELIMINARY - NOT FOR CONSTRUCTION

Plot Date: 1/29/2024 4:52 PM
Saved By: SHAHIDM
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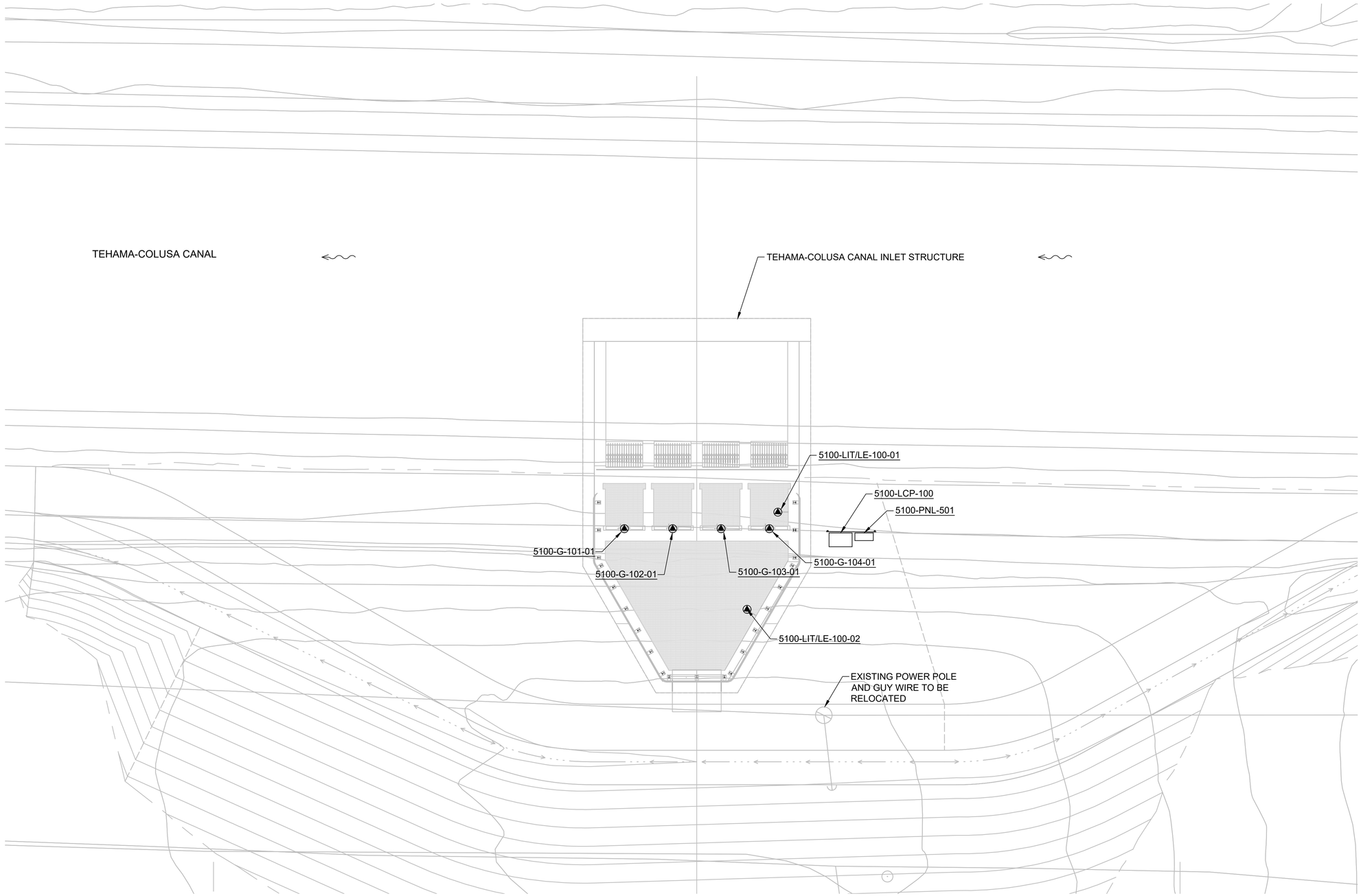

PLAN
HORIZ SCALE: 1" = 10'

0 10' 20'

N

GENERAL NOTES

SHEET KEY NOTES

PRELIMINARY - NOT FOR CONSTRUCTION

REV	DATE	BY	CHK.	APPR.	DESCRIPTION

DESIGNED BY: C. CUSWORTH
DRAWN BY: E. GARCIA
CHECKED BY: J. LANDMAN
IN CHARGE: P. RUDE
DATE: 02-02-2024

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2525 AIRPARK DR
REDDING, CA 96001
(530) 243-5831

REGISTERED
PROFESSIONAL
ENGINEER
CRAIG M. CUSWORTH
19120
CALIFORNIA

Sites

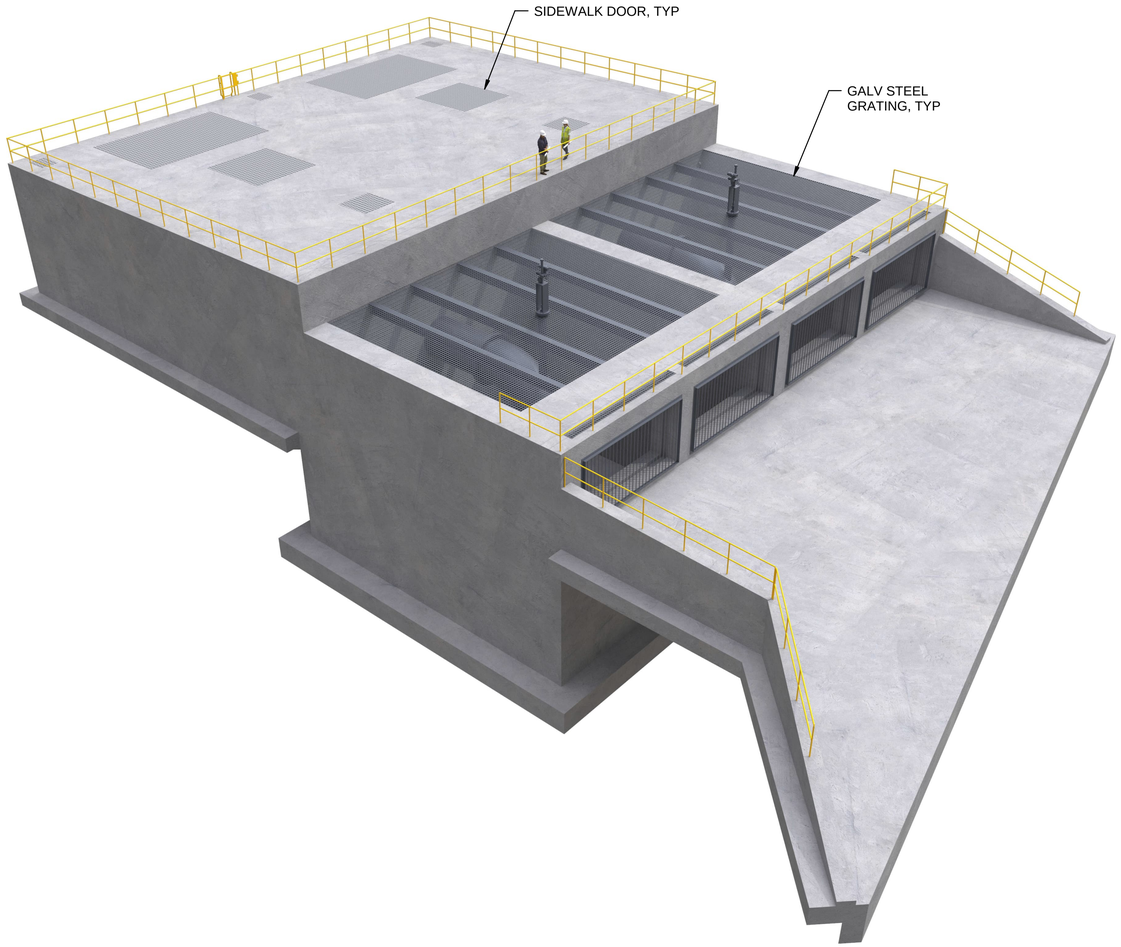
SITES RESERVOIR

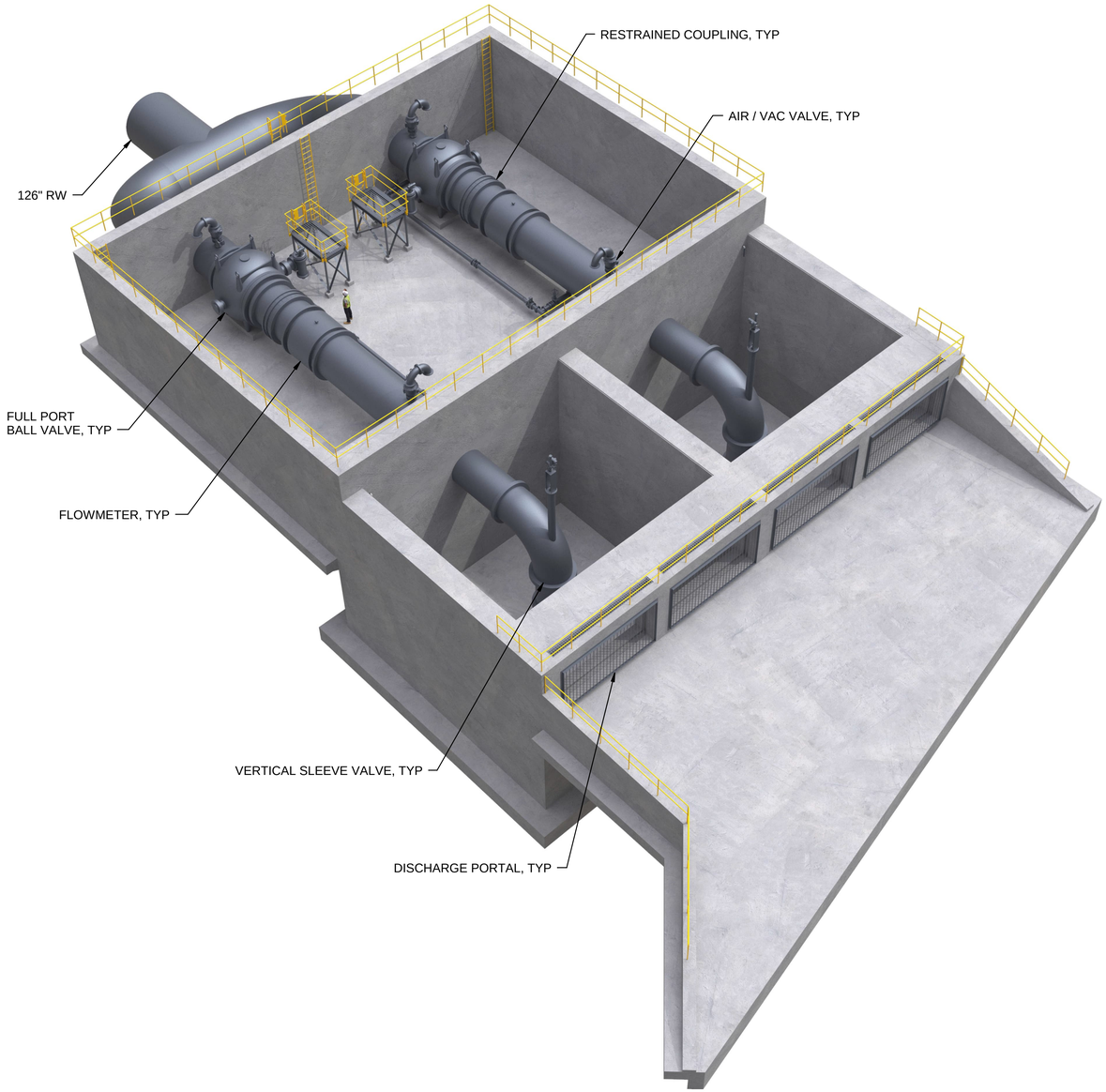
DUNNIGAN PIPELINE
ELECTRICAL
DUNNIGAN PIPELINE
T-C CANAL INLET STRUCTURE
PLAN

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

DRAWING NO.
DNP-5100-E-2001
SHT 36 OF 55

Plot Date: 1/30/2024 9:10 AM
Saved By: RS033139
File: C:\pwworking\hdr_sites_reservoir\dms01283\DNP-5100-E-2001.dwg





REV	DATE	BY	CHK.	APPR.	DESCRIPTION

DESIGNED BY: J. BLUM
DRAWN BY: S. WAGONER
CHECKED BY: B. MEMEO
IN CHARGE: P. RUDE
DATE: 02-02-2024

Jacobs
2525 AIRPARK DR
REDDING, CA 96001
(530) 2435831

RENDERINGS ARE NOT CONSIDERED A DRAWING AS DEFINED IN THE GENERAL CONDITIONS AND ARE INCLUDED FOR REFERENCE ONLY

Sites

SITES RESERVOIR

DUNNIGAN PIPELINE
GENERAL
DUNNIGAN PIPELINE
CBD DISCHARGE STRUCTURE
RENDERING

VERIFY SCALES

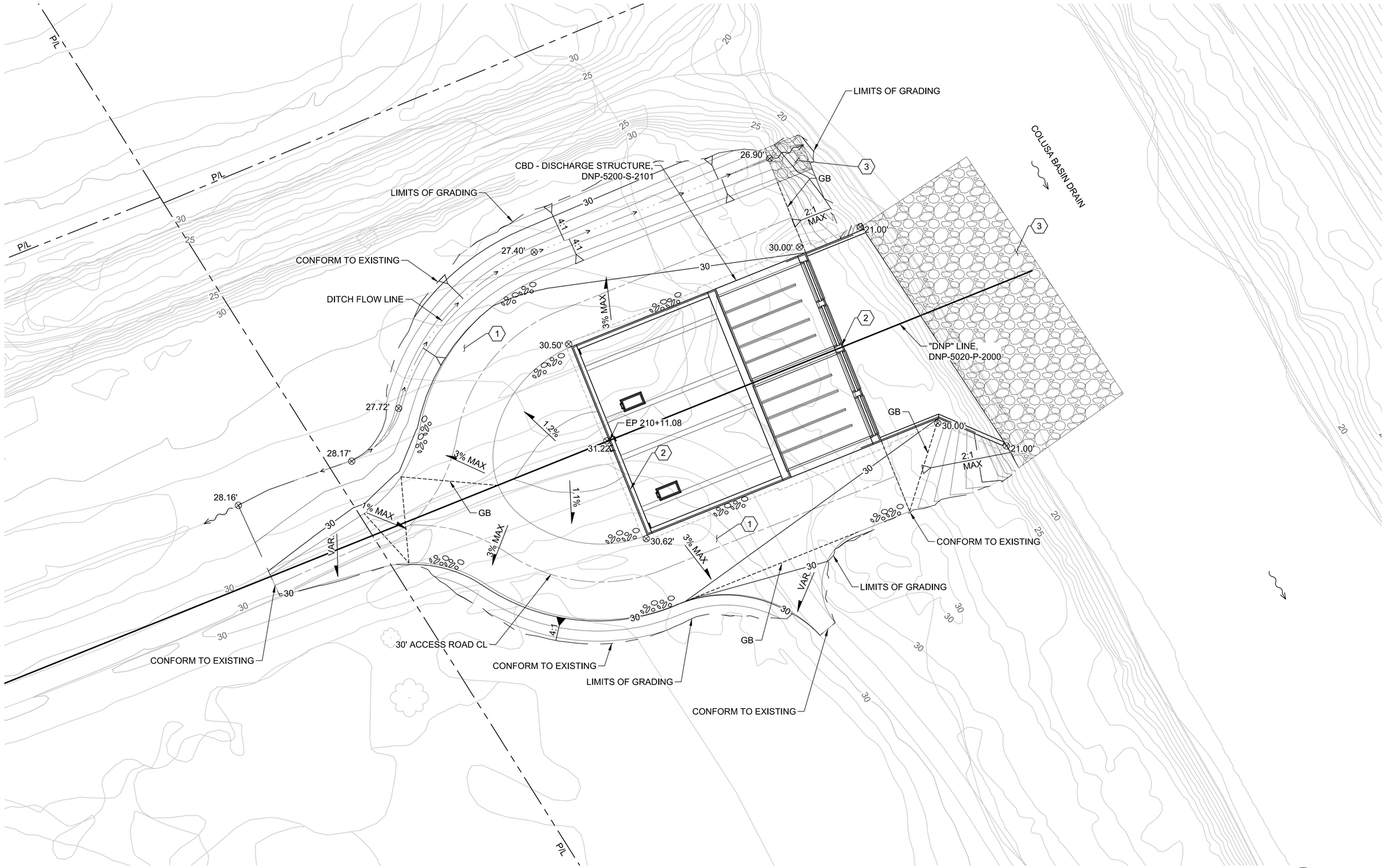
BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS

0 1"

DRAWING NO.
DNP-5200-G-0001
SHT 38 OF 55

PRELIMINARY - NOT FOR CONSTRUCTION

BIM 360://10333221_Site Reservoir Project_2022/DNP-5200-G-z3Dn01.rvt
1/16/2024 2:14:43 PM



PLAN
HORIZ SCALE: 1"=20'

0 20' 40'

N

GENERAL NOTES

SHEET KEY NOTES

1. GRAVEL SURFACING (3215-260)
2. GALVANIZED STEEL 2-RAIL RAILING WITH TYPE 'B' ANCHORAGE.
3. RIPRAP.

REV	DATE	BY	CHK.	APPR.	DESCRIPTION

DESIGNED BY: M. SHAHIDI
DRAWN BY: M. SHAHIDI
CHECKED BY: ASHLEY KELLOGG
IN CHARGE: P. RUDE
DATE: 02-02-2024

Jacobs
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(530) 243-5831

REGISTERED PROFESSIONAL ENGINEER
ASHLEY KELLOGG
76561
CALIFORNIA

Sites

SITES RESERVOIR

DUNNIGAN PIPELINE
CIVIL
DUNNIGAN PIPELINE
CBD DISCHARGE STRUCTURE
SITE PLAN

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

DRAWING NO.
DNP-5200-C-2001
SHT 39 OF 55

PRELIMINARY - NOT FOR CONSTRUCTION

Plot Date: 1/29/2024 4:49 PM
Saved By: SHAHIDM
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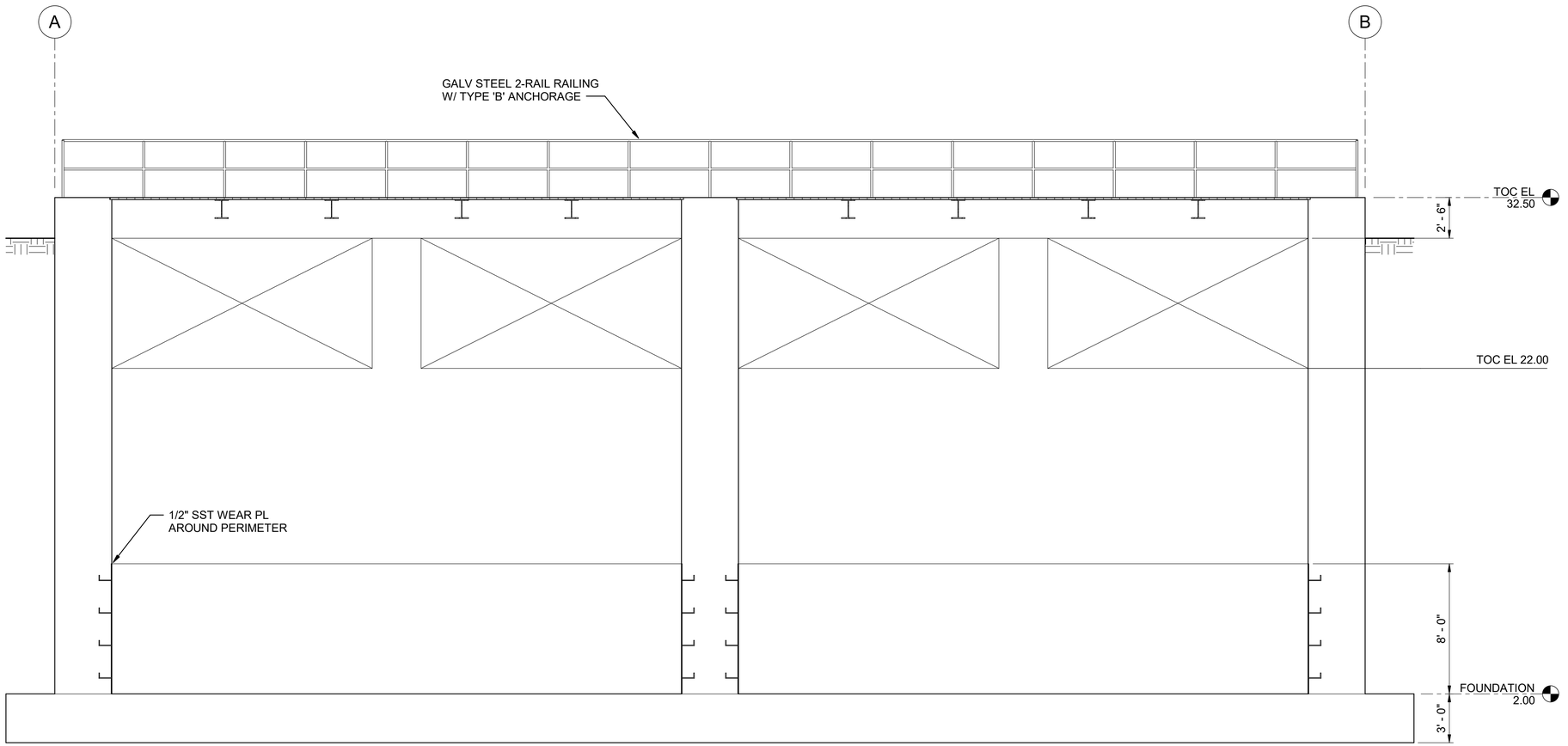

B5 SECTION
1/4" = 1'-0"

DNP-5200-S-2001

REV	DATE	BY	CHK.	APPR.	DESCRIPTION

DESIGNED BY: J. KELLOGG
DRAWN BY: A. GAWOR
CHECKED BY: H. HENRIKSON
IN CHARGE: P. RUDE
DATE: 02-02-2024

Jacobs
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REDDING, CA 96001
(530) 2435831

REGISTERED
PROFESSIONAL
ENGINEER
JEREMY KELLOGG
P.E. REG No. 5698
CALIFORNIA

Sites

SITES RESERVOIR

DUNNIGAN PIPELINE
STRUCTURAL
DUNNIGAN PIPELINE
CBD DISCHARGE STRUCTURE
SECTION

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

DRAWING NO.
DNP-5200-S-3002
SHT 43 OF 55

PRELIMINARY - NOT FOR CONSTRUCTION

BIM 360://10333221_Site Reservoir Project_2022/DNP-5200-S-z3Dh01.rvt
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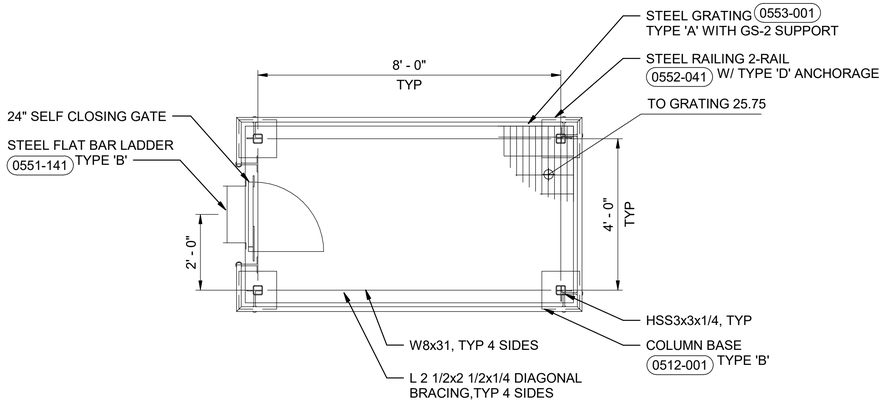

E2 DETAIL
1/2" = 1'-0"

DNP-5200-S-2001

REV	DATE	BY	CHK.	APPR.	DESCRIPTION

DESIGNED BY: J. KELLOGG
DRAWN BY: A. GAWOR
CHECKED BY: H. HENRIKSON
IN CHARGE: P. RUDE
DATE: 02-02-2024

Jacobs
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(530) 2435831

REGISTERED
PROFESSIONAL
ENGINEER
JEREMY KELLOGG
P.E. REG No. 5698
CALIFORNIA

Sites

SITES RESERVOIR

DUNNIGAN PIPELINE
STRUCTURAL
DUNNIGAN PIPELINE
CBD DISCHARGE STRUCTURE
DETAILS

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

DRAWING NO.
DNP-5200-S-5001
SHT 44 OF 55

PRELIMINARY - NOT FOR CONSTRUCTION

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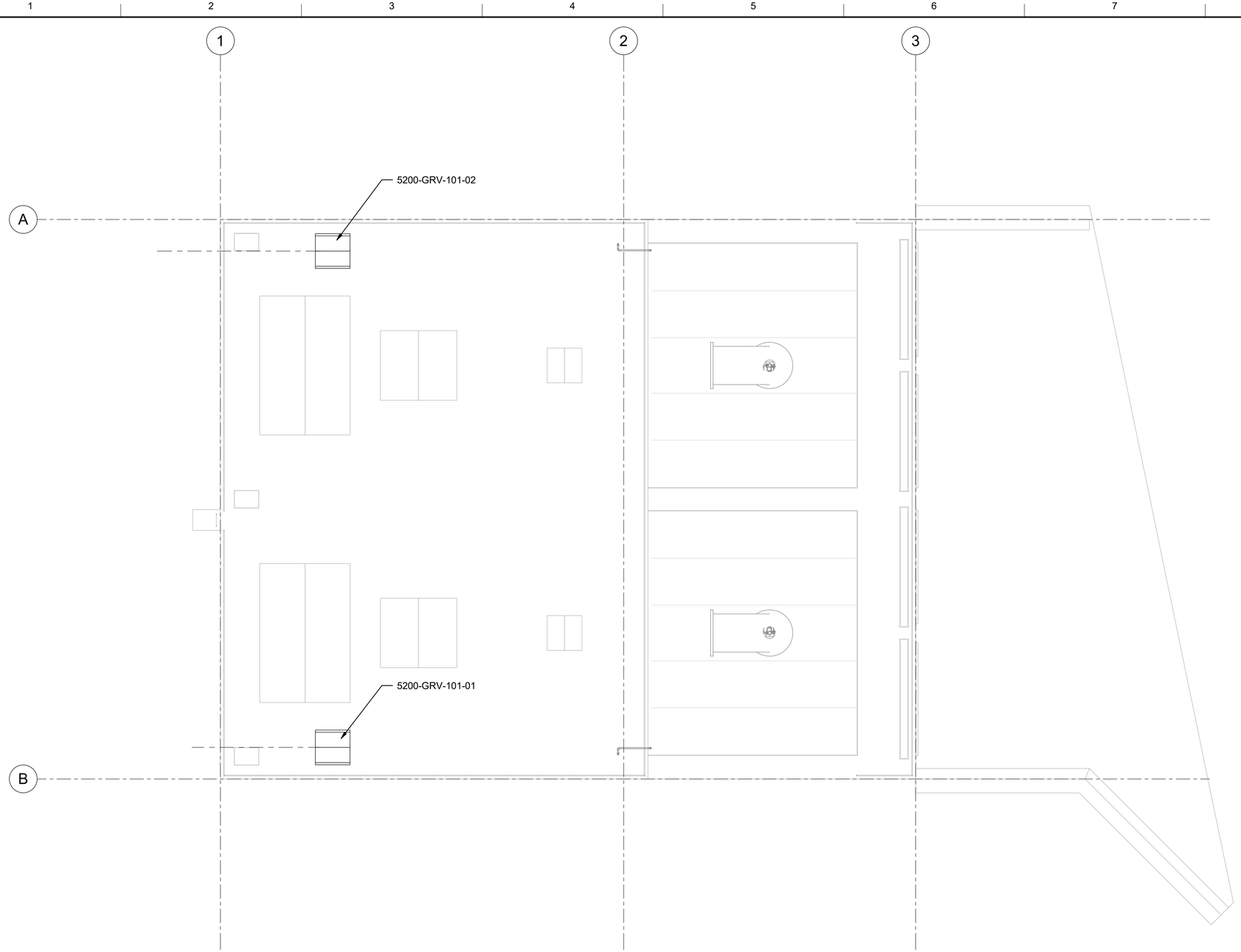

GROUND LEVEL PLAN
1/8" = 1'-0"

GENERAL NOTES

SHEET KEY NOTES

REV	DATE	BY	CHK.	APPR.	DESCRIPTION

DESIGNED BY: S. SHRIEF
DRAWN BY: S. HOSTETLER
CHECKED BY: T. PRICE
IN CHARGE: P. RUDE
DATE: 02-02-2024

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REGISTERED
PROFESSIONAL
ENGINEER
SHRIEF E SHRIEF
P.E. REG No. 39122
CALIFORNIA

Sites

SITES RESERVOIR

DUNNIGAN PIPELINE
HVAC
DUNNIGAN PIPELINE
CBD DISCHARGE STRUCTURE
GROUND LEVEL PLAN

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING. ADJUST SCALES FOR REDUCED PLOTS
0 1"

DRAWING NO.
DNP-5200-H-2101
SHT 48 OF 55

PRELIMINARY - NOT FOR CONSTRUCTION

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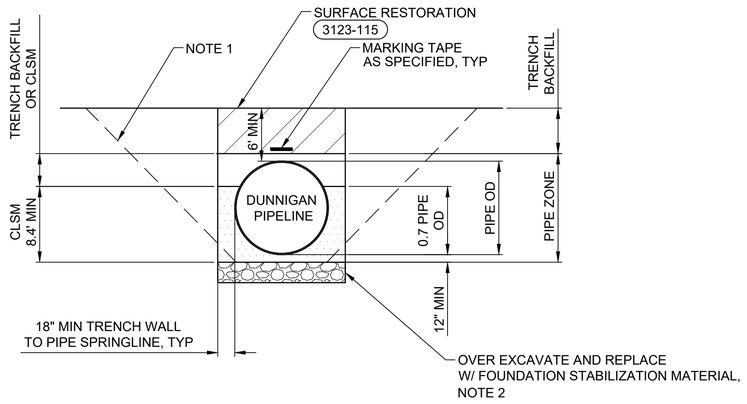


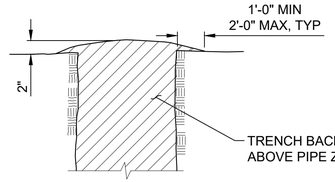
NOTES:

1. CONTRACTOR SHALL SLOPE TRENCH WALLS AND SHORE EXCAVATIONS FOR CONSTRUCTION AND SAFETY IN ACCORDANCE WITH CURRENT OSHA REQUIREMENTS AND SPECIFICATIONS.
2. FOUNDATION STABILIZATION SHALL BE INSTALLED ONLY AS APPROVED AND DIRECTED BY THE ENGINEER AND IN ACCORDANCE WITH THE SPECIFICATIONS.
3. TRENCH SECTION AND DIMENSIONS ARE SHOWN PERPENDICULAR TO THE PIPELINE ALIGNMENT.

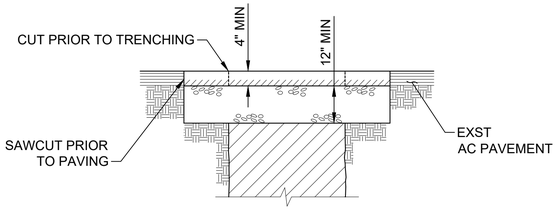
TRENCH DETAIL

NTS

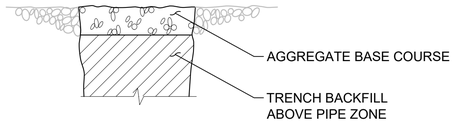
3123-110



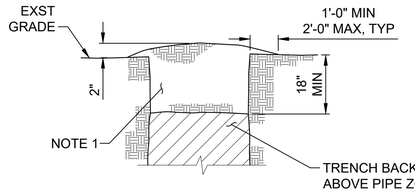
TYPE A - UNIMPROVED SURFACING



TYPE C - ASPHALT PAVEMENT



TYPE B - GRAVEL SURFACING



TYPE D - TOPSOIL SURFACING

NOTES:

1. TOPSOIL SHALL BE REMOVED, STOCKPILED, AND REPLACED IN ACCORDANCE WITH THE SPECIFICATIONS.

SURFACE RESTORATION

NTS

3123-115

TITLE

NTS

XXXX-XXX

TITLE

NTS

XXXX-XXX

TITLE

NTS

XXXX-XXX

TITLE

NTS

XXXX-XXX

REV	DATE	BY	CHK.	APPR.	DESCRIPTION

DESIGNED BY: I. BARRIOS
DRAWN BY: T. OLIWA
CHECKED BY: B. MEMEO
IN CHARGE: P. RUDE
DATE: 02-02-2024

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REGISTERED PROFESSIONAL ENGINEER
BRAD L. MEMEO
C81778
CALIFORNIA

Sites

SITES RESERVOIR

DUNNIGAN PIPELINE
CIVIL
STANDARD DETAILS

VERIFY SCALES

BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS

0 1"

DRAWING NO.
DNP-5900-C-5001
SHT 51 OF 55

PRELIMINARY - NOT FOR CONSTRUCTION

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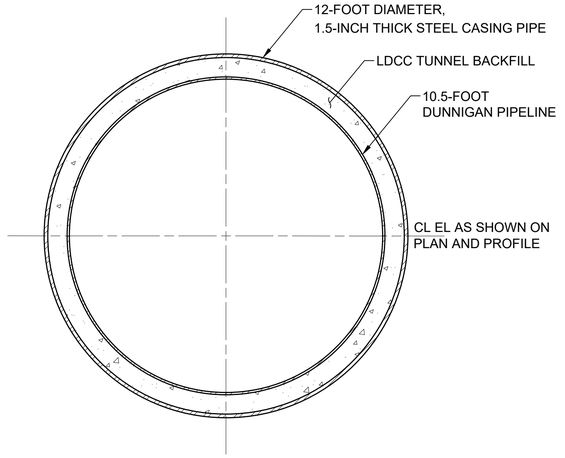
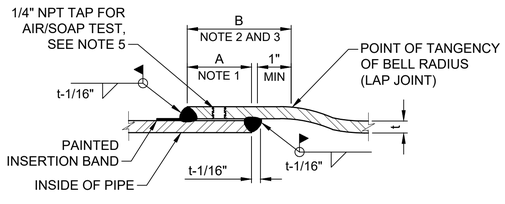


TUNNEL SECTION

NTS

3305-761



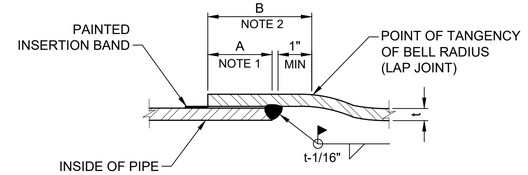
NOTES:

1. DIMENSION "A" CORRESPONDS TO THE COMPLETED JOINT OVERLAP AFTER WELDING. DIMENSION "A" IS THE GREATER OF 3 INCHES OR 5t, MINIMUM FOR STANDARD JOINTS. INCREASE DIMENSION "A" FOR SPECIAL TEMPERATURE CONTROL JOINTS AS FURTHER DISCUSSED IN NOTE 3.
2. PROVIDE THE MINIMUM OVERLAP DIMENSION "A" AND MAINTAIN THE INDICATED HOLDBACK FOR THE WELD AS REQUIRED FOR THE MINIMUM DIMENSION "B" FOR STANDARD JOINTS.
3. INCREASE DIMENSION "B" BY 3 INCHES FOR SPECIAL TEMPERATURE CONTROL JOINTS AS FURTHER DISCUSSED. AT THE TIME OF INSTALLATION AND PRIOR TO WELDING, INSERT THE SPIGOT INTO THE LENGTHENED BELL TO PROVIDE "A" +3 INCHES MINIMUM OVERLAP. SEE SPECIFICATIONS FOR SPECIAL TEMPERATURE CONTROL JOINT WELDING REQUIREMENTS.
4. CONFIGURATION FOR BELL AND SPIGOT LAP JOINTS SHOWN. CONFIGURATION ON BUTT STRAP JOINTS ARE SIMILAR.
5. INSTALL TAP ON BELL. PERFORM AIR/SOAP TEST AND OTHER WELD TESTS AS REQUIRED IN ACCORDANCE WITH SPECIFICATIONS. PLUG TAP WITH WELDED PLUG AFTER COMPLETION OF SUCCESSFUL AIR/SOAP TEST.
6. FABRICATE AND INSTALL JOINTS WITHIN THE TOLERANCES INDICATED. TOLERANCE REQUIREMENTS APPLY TO BOTH WELDS AND TO BOTH STRAIGHT AND DEFLECTED JOINTS.
7. LININGS AND COATINGS ARE NOT SHOWN FOR CLARITY.

DOUBLE LAP JOINT WELD

NTS

3305-903



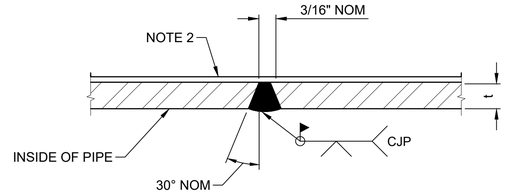
NOTES:

1. DIMENSION "A" CORRESPONDS TO THE COMPLETED JOINT OVERLAP AFTER WELDING. DIMENSION "A" IS THE GREATER OF 3 INCHES OR 5t.
2. PROVIDE THE MINIMUM OVERLAP DIMENSION "A" AND MAINTAIN THE INDICATED HOLDBACK FOR THE WELD AS REQUIRED FOR THE MINIMUM DIMENSION "B".
3. CONFIGURATION FOR BELL AND SPIGOT LAP JOINTS SHOWN. CONFIGURATION ON BUTT STRAP JOINTS ARE SIMILAR.
4. FABRICATE AND INSTALL JOINTS WITHIN THE TOLERANCES INDICATED. TOLERANCE REQUIREMENTS APPLY TO BOTH WELDS AND TO BOTH STRAIGHT AND DEFLECTED JOINTS.
5. SINGLE LAP WELD CONSISTS OF ONE SINGLE STRUCTURAL WELD ON THE INSIDE OF THE JOINT.
6. USE SINGLE LAP FILLET WELDS ONLY WHERE SPECIFICALLY SHOWN ON DRAWINGS.
7. LININGS AND COATINGS ARE NOT SHOWN FOR CLARITY.

SINGLE LAP JOINT WELD

NTS

3305-904



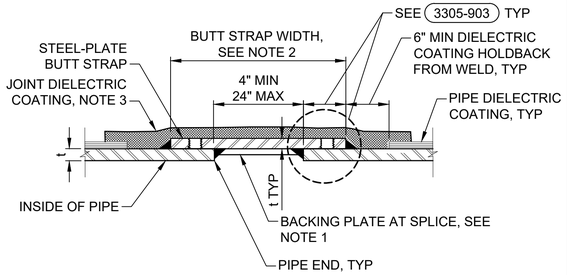
NOTES:

1. LINING AND COATING ARE NOT SHOWN FOR CLARITY.
2. AFTER FIELD WELDING JOINT AND PRIOR TO BACKFILL GROUTING THE TUNNEL, INSTALL HEAT SHRINK SLEEVE ON EXTERIOR OF JOINT. HOLIDAY TEST AFTER INSTALLATION AS SPECIFIED.
3. ROOT OPENING MAY BE 3/4" MAX PER AWS D1.1 PARAGRAPH 5.22.4.3 WITH FIELD BUTTERING OF BEVELED JOINT WITH WELDMENT.

BUTT WELD JOINT

NTS

3305-907



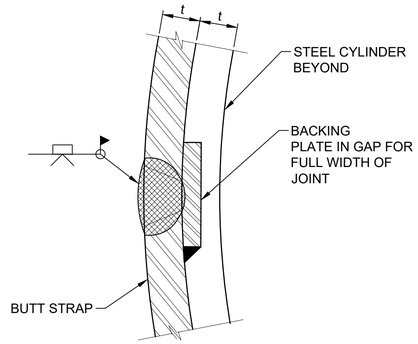
NOTES:

1. FOR FIELD WELDING OF INDIVIDUAL BUTT STRAP PIECES TO EACH OTHER, SEE 3305-910
2. UNLESS OTHERWISE NOTED, CONFORM BUTT STRAP WIDTH TO THE LIMITATIONS SHOWN FOR PIPE END SEPARATION AND STEEL OVERLAP REQUIREMENTS. THIS INCLUDES THE ADDITIONAL 3-INCH INCREASE IF A TEMPERATURE CONTROL JOINT IS REQUIRED AT A BUTT STRAP JOINT IF INDICICATED.
3. HOLIDAY TEST AFTER INSTALLATION AS SPECIFIED.

BUTT STRAP JOINT

NTS

3305-908



NOTES:

1. LININGS AND COATINGS ARE NOT SHOWN FOR CLARITY.
2. BEVEL ENDS OF BACKING PLATE AT BUTT STRAP PRIOR TO WELDING OR BACK GOUGE AT CONTACT WITH ADJACENT CYLINDER PRIOR TO COMPLETING INSIDE FILLET WELD.

BUTT STRAP SPLICE

NTS

3305-910

DETAIL

NTS

XXXX-XXX

DETAIL

NTS

XXXX-XXX

REV	DATE	BY	CHK.	APPR.	DESCRIPTION

DESIGNED BY: I. BARRIOS
DRAWN BY: T. OLIWA
CHECKED BY: B. MEMEO
IN CHARGE: P. RUDE
DATE: 02-02-2024

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ENGINEER
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C81778
CALIFORNIA

Sites

SITES RESERVOIR

DUNNIGAN PIPELINE
CIVIL
STANDARD DETAILS

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

DRAWING NO.
DNP-5900-C-5003
SHT 53 OF 55

PRELIMINARY - NOT FOR CONSTRUCTION

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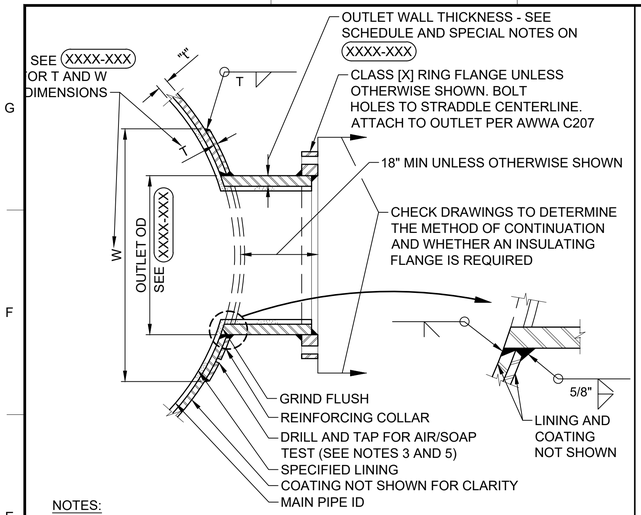


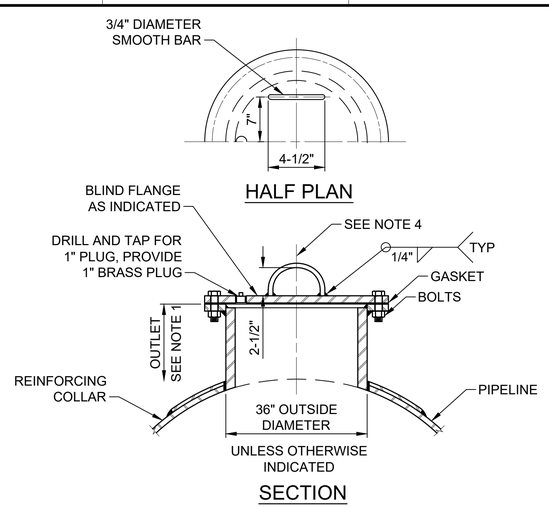
NOTES:

1. COAT ALL EXPOSED SURFACES AS SPECIFIED.
2. "t" INDICATES THE THICKNESS OF THE WSP AT THE STATION WHERE USED.
3. TEST WELDS IN ACCORDANCE WITH SPECIFICATIONS.
4. USE SAME MATERIAL FOR CONSTRUCTION OF REINFORCING COLLARS AS THE ADJOINING PIPING (MAIN PIPE).
5. PLUG TAP WITH WELDED PLUG AFTER COMPLETION OF AIR/SOAP TEST.
6. DESIGN REINFORCED OUTLETS IN ACCORDANCE WITH AWWA M11 4TH EDITION.

3-INCH AND LARGER COLLARED OUTLETS

NTS

3305-937



NOTES:

1. FABRICATE OUTLET PER 3305-937.
2. LINE AND COAT AS SPECIFIED.
3. AFTER COMPLETION OF BACKFILLING PROVIDE A PERMANENT MARKER DIRECTLY ABOVE MANWAY AS INDICATED.

ACCESS MANWAY

NTS

3305-940

DETAIL

NTS

XXXX-XXX

DETAIL

NTS

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DETAIL

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DETAIL

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XXXX-XXX

DETAIL

NTS

XXXX-XXX

REV	DATE	BY	CHK.	APPR.	DESCRIPTION

DESIGNED BY: I. BARRIOS
DRAWN BY: T. OLIWA
CHECKED BY: B. MEMEO
IN CHARGE: P. RUDE
DATE: 02-02-2024

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Sites

SITES RESERVOIR

DUNNIGAN PIPELINE
CIVIL
STANDARD DETAILS

VERIFY SCALES

BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS

0 1"

DRAWING NO.
DNP-5900-C-5005
SHT 55 OF 55

PRELIMINARY - NOT FOR CONSTRUCTION

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