SERVICE	LEGEND	SIZE (IN)	INSTALLATION	MATERIAL	SPEC SECTION	MAXIMUM OPERATING PRESSURE (PSIG)	MAXIMUM OPERATING TEMPERATURE (DEG F)	TEST PRE. AND TYPE (PSIG)	LINING/COATING	REMARKS
AQUEOUS AMMONIA	NH3	1/2 TO 1	EXP, DC	SST	40 05 13	120	70	180H	BARE/BARE	DC; SEE NOTE 13
			BUR, DC							
CITRIC ACID	CA	1/2 TO 1 1/2	EXP, DC	SST	40 05 13	15	70	50H	BARE/BARE	DC; SEE NOTE 13
FLUORIDE (HYDROFLUOSILICIC ACID)	F	1/2 TO 1	EXP, DC	SST	40 05 13	120	70	180H	BARE/BARE	DC; SEE NOTE 13
			BUR, DC							
SODIUM BISULFITE	SBS	1/2 TO 1	EXP, DC	SST	40 05 13	90	70	150H	BARE/BARE	DC; SEE NOTE 13
			BUR, DC							
SODIUM HYPOCHLORITE	NaOCL	1/2 TO 1	EXP, DC	PVC	40 05 13	120	70	180H	BARE/BARE	DC; SEE NOTE 13
			BUR, DC							
SODIUM HYDROXIDE	NaOH	1/2 TO 1	EXP, DC	SST	40 05 13	70	70	150H	BARE/BARE	DC; SEE NOTE 13
SULFURIC ACID	H2SO4	1/2 TO 1	EXP, DC	Alloy 20	40 05 13	70	70	150H	BARE/BARE	DC; SEE NOTE 13
THRESHOLD INHIBITOR	TI	1/2 TO 1	EXP, DC	SST	40 05 13	90	70	150	BARE/BARE	DC; SEE NOTE 13
CORROSION INHIBITOR	CI	1/2 TO 1	EXP, DC	SST	40 05 13	70	70	150H	BARE/BARE	DC; SEE NOTE 13
BLENDED WATER	BW	18	EXP	SST	40 05 13	15	70	50	BARE/BARE	
			BUR	C905	40 05 13	5	75	50	BARE/BARE	PRJ; SEE NOTE 5; SEE NOTE 13
RO FEED	ROF	10 TO 12	EXP	2205	40 05 13	250	70	375H	BARE/BARE	
RO PERMEATE	ROP	6 TO 16	BUR, ENC	SST	40 05 13	30	70	50H	BARE/BARE	SEE NOTE 12; SEE NOTE 13
			EXP/BUR	PVC						SEE NOTE 13
RO CONCENTRATE	ROC	2 TO 10	BUR, ENC	2507	40 05 13	70	70	100H	BARE/BARE	SEE NOTE 12
			BUR	PVC						
			EXP	2507		250/70		375/100H	BARE/BARE	SEE NOTE 10
RO FLUSH	FL	6 TO 12	EXP	PVC	40 05 13	70	70	150H	BARE/BARE	
RO BYPASS	ROB	4 TO 6	EXP/BUR	PVC	40 05 13	60	75	150H	BARE/BARE	SEE NOTE 13
CLEANING CONCENTRATE RETURN	CCR	3 TO 10	EXP	SST/PVC	40 05 13	250/70	130	375/150H	BARE/BARE	SEE NOTE 11
CLEANING PERMEATE RETURN	CPR	3 TO 4	EXP	SST/PVC	40 05 13	15	85	50H	BARE/BARE	SEE NOTE 11
CLEANING FEED	CF	6 TO 10	EXP	SST/PVC	40 05 13	70	130	150H	BARE/BARE	SEE NOTE 11
CARTRIDGE FILTER INFLUENT	CFI	12 TO 18	EXP	2205	40 05 13	75	75	150H	BARE/BARE	
CARTRIDGE FILTER EFFLUENT	CFE	12 TO 18	EXP	2205	40 05 13	75	75	150H	BARE/BARE	
RAW WATER	RW	16 TO 18	EXP	2205	40 05 13	90	70	150H	BARE/BARE	
			BUR	HDPE					BARE/BARE	
			BUR,ENC	2205					BARE/BARE	SEE NOTE 12
FILTER WATER SUPPLY	FWS	12 TO 18	EXP	2205	40 05 13	70	75	150H	BARE/BARE	
			BUR	2205					BARE/BARE	
			BUR,ENC	2205					BARE/BARE	SEE NOTE 12
RECLAIM WATER	RCW	4 TO 10	EXP	2205	40 05 13	85	75	150H	BARE/BARE	
			BUR,ENC	2205					BARE/BARE	SEE NOTE 12
BACKWASH WATER SUPPLY	BWS	14 TO 16	EXP	2205	40 05 13	25	75	50H	BARE/BARE	
			BUR,ENC	2205					BARE/BARE	SEE NOTE 12
BACKWASH WATER RECLAIM	BWR	12 TO 14	EXP	2205	40 05 13	25	75	50H	BARE/BARE	
			BUR,ENC	2205					BARE/BARE	SEE NOTE 12
PURGE WATER RECLAIM / RINSE WATER RECLAIM	PWR/RWR	12	EXP	2205	40 05 13	60	75	150H	BARE/BARE	
			BUR,ENC	2205					BARE/BARE	SEE NOTE 12
DRAIN	D	All	ALL	PVC	40 05 13	-		G	BARE/BARE	SW
FINISHED WATER	FW	12 TO 16	EXP	STL	40 05 13	110	75	180H	NO.1/NO.5	SEE NOTE 13
			BUR	C905					BARE/BARE	PRJ; SEE NOTE 5; SEE NOTE 13
PURGE	PRG	12 TO 16	EXP	2205	40 05 13	90	70	150H	BARE/BARE	
			BUR	HDPE					BARE/BARE	
			BUR,ENC	2205					BARE/BARE	SEE NOTE 12
PERMEATE TO WASTE	PTW	16	EXP	PVC	40 05 13	30	70	50H	BARE/BARE	
SALT SOLUTION	SSOL	All	EXP/BUR	PVC	40 05 13	20	70	30H	BARE/BARE	
TEPID WATER, POTABLE	TW1	All	ALL	CU	22 00 00	-	90	50H	BARE/BARE	SW; SEE NOTE 13
HOT WATER, DOMESTIC	DHW	All	EXP	CU	22 00 00	80	140	PC	BARE/BARE	SW; SEE NOTE 13
HOT WATER, RECIRCULATED,	RHW	All	ALL	CU	22 00 00	80	140	PC	BARE/BARE	SW; SEE NOTE 13
CONDENSATE DRAIN	CND	All	ALL	PVC	40 05 13	-	140	G	BARE/BARE (NO.25)	SW; COAT WITH SYSTEM NO. 25
CHEMICAL RESISTANT DRAIN	CRD	All	ALL	PP	22 00 00	-	140	PC-G	BARE/BARE	
FIRE PROTECTION	FP	All	EXP	CLDI	40 05 13	80	70	150H	NO.1/NO.5	PRJ; SEE FIRE PROTECTION DETAILS FOR USE OF CLDI
			BUR						CEMENT/BIT	
FIRE SPRINKLER SERVICE	FS	<=3	EXP	STL	21 13 00	PER SPEC	70	PER SPEC	BARE/PER SPEC	SEE NOTE 13 AND 9 FOR BUR
		>=4	EXP/BUR	CLDI						
ROOF DRAIN	RD	All	ALL	CISP	22 00 00	-	140	PC-G	BARE/NO.5	
TRAP PRIMER	TP	All	EXP	CU	22 00 00	-	140	PC	BARE/NO.10	
			ENC						BARE/PER SPEC	
PLANT WATER, POTABLE	W1	<=3	EXP	CU	22 00 00	80	70	150H	BARE/NO.10	SW; SEE NOTE 13
			BUR	CU	22 00 00				BARE/Tape Wrap	
			BUR, ENC	SST	40 05 13				BARE/BARE	SEE NOTE 13
		>=4	EXP	STL	40 05 13				NO.1/NO.5	SEE NOTE 13
			BUR	CLDI	40 05 13				CEMENT/BIT	SEE NOTE 13 AND NOTE 9
			BUR, ENC	SST	40 05 13				BARE/BARE	SEE NOTE 12; SEE NOTE 13
PLANT WATER, PROCESS	W2	<=3	EXP	STL	40 05 13	80	70	150H	BARE/NO.5	SW
			BUR	PVC	40 05 13				BARE/BARE	
			BUR, ENC	SST	40 05 13				BARE/BARE	
		>=4	EXP	STL	40 05 13				NO.1/NO.5	
			BUR	CLDI	40 05 13				CEMENT/BIT	SEE NOTE 9
			BUR, ENC	SST	40 05 13				BARE/BARE	SEE NOTE 12
SAMPLE	S	1/4 TO 3/8	EXP	SST TUBING	40 05 13	30	70	50H	BARE/BARE	
		1/2 TO 1	EXP/BUR	PVC	40 05 13					SW
STORM DRAIN	SD	All	BUR	PVC	40 05 13	-	140	PC-G	BARE/BARE	
SANITARY VENT	VS	All	ALL	CISP	22 00 00	-	140	PC-G	BARE/BARE	
SANITARY SEWER	SS	All	BUR	PVC	40 05 13	-	140	PC-G	BARE/BARE	
INSTRUMENT AIR	IA	1/4 TO 3/8	EXP	SST TUBING	40 05 13	100	130	150	BARE/BARE	
		1/2 TO 2	EXP	SST					BARE/NO.5	

NOTES:

1. WHERE PIPING CARRIES TWO OR MORE SERVICE DESIGNATIONS THE PIPING MATERIAL SHALL CONFORM TO THE REQUIREMENT FOR THE FIRST SERVICE LISTED (e.g. TSL/OF WOULD REQUIRE THE MATERIAL USED FOR TSL PIPING.

2. ">" GREATER THAN; "<" LESS THAN
   "<=" LESS THAN OR EQUAL TO; ">=" GREATER THAN OR EQUAL TO
   "ALL" ALL SIZES

3. GLDI: GLASS-LINED DUCTILE IRON
   CLDI: CEMENT-LINED DUCTILE IRON
   GSP: GALVANIZED STEEL PIPE
   SST: STAINLESS STEEL, 316L
   STL: MILL TYPE STEEL
   CU: COPPER
   WS: FABRICATED WELDED STEEL
   PVC: POLYVINYL CHLORIDE
   CISP: CAST IRON SOIL PIPE
   PP: POLYPROPYLENE
   PE: POLYETHYLENE PRESSURE PIPE
   PIP: PREINSULATED PIPE
   HDPE: HIGH DENSITY POLYETHYLENE PIPE
   2205: DUPLEX STAINLESS STEEL
   2507: SUPER DUPLEX STAINLESS STEEL
   ALLOY 20: STAINLESS STEEL ALLOY 20

4. INSTALLATIONS
   EXP: EXPOSED (INTERIOR OR EXTERIOR AND IN TRENCHES)
   BUR: BURIED
   ENC: ENCASED IN CONCRETE
   EMB: EMBEDDED IN CONCRETE WALLS OR SLABS
   ALL: ALL INSTALLATIONS WITHIN LISTED SIZE

5. C900 AND C905 PVC PIPES WITH CLDI FITTINGS.

6. JOINTS AS SPECIFIED IN SECTION 40 05 13 PIPELINES, LIQUID PROCESS PIPING

   FL - FLANGED
   GR - GROOVED
   PRJ - PROPRIETARY RESTRAINED JOINT; FITTINGS TO BE CLDI
   HU - HUB AND SPIGOT
   W - WELDED
   S - SCREWED
   SW - SOCKET WELD
   DC - DOUBLE CONTAINED

7. COATING SYSTEM NUMBERS AS SPECIFIED IN SECTION 09 90 00.00 40, PAINTING AND COATING

8. H: HYDROSTATIC TEST
   P: PNEUMATIC TEST
   G: GRAVITY PIPE - TEST PRESSURES NOT SHOWN ON GRAVITY PIPES. TEST TO HIGHEST LEVEL THAT PIPE CAN BE SUBJECTED TO
   PC: TEST PER UNIFORM PLUMBING CODE

9. PBW - POLYETHYLENE BAG WRAP (ENCASEMENT)
   PDP - PUMP DISCHARGE PIPING
   BIT - BITUMINOUS

10. RO CONCENTRATE PIPELINE, FROM SECOND STAGE DISCHARGE THROUGH TURBOCHARGER TO FCV-31210/ 32210, SHALL BE 2507 AS SHOWN ON MECHANICAL DRAWINGS

11. HEADERS AND BRANCHES UP TO THE ISOLATION VALVES AT RO SKID SHALL BE PVC AND BRANCHES AT THE RO SKIDS SHALL BE 316L SST AS SHOWN ON MECHANICAL DRAWINGS.

12. ALL PIPES BELOW THE SLAB SHALL BE CONCRETE ENCASED.

13. PIPE SHALL BE DISINFECTED.

REGISTERED PROFESSIONAL ENGINEER QINGSHAN WANG No. M032378 Exp. 06-30-11 MECHANICAL STATE OF CALIFORNIA

DATE: 10/05/09

SYMBOL	DESCRIPTIONS	DATE	APPROVAL

REVISIONS

EASTERN MUNICIPAL WATER DISTRICT
PERRIS II DESALINATION FACILITY
PERRIS, CALIFORNIA

PIPING SCHEDULE

U.S. ARMY ENGINEER DISTRICT
LOS ANGELES
CORPS OF ENGINEERS

DESIGNED BY: Q WANG
DRAWN BY: A GORDEN
CHECKED BY: A NAMEY

CH2MHILL

SUBMITTED BY:
ART JUNG, P.E.
CHIEF, DESIGN BRANCH

CADD FILE NAME: PDFg013d.dgn
SPEC. NO.: NOT APPLICABLE
L.A. DISTRICT FILE NO. XXX-XXXX

G-13

SHEET 13 OF 226 SHEETS

NDM-SCO-EMWD USACE PERRIS II/ PDFg013d.dgn PLOT DATE: 2/19/2010 PLOT TIME: 10:52:50 AM