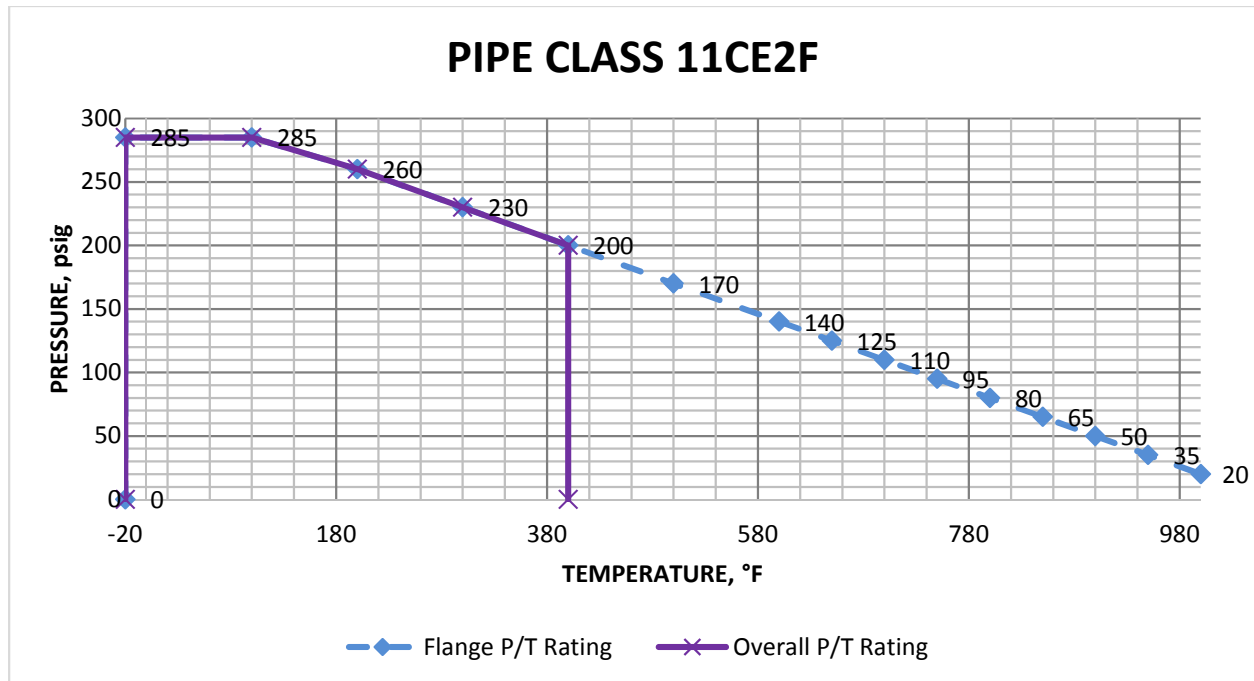




SERVICES: Fire Water (WF)		REMARKS: 1. This PMC is designed for full flange rating under temperature limit. 2. Above ground only.	
DESIGN CODE:	ASME B31.1	SIZE RANGE:	NPS 0.5 to 24
RATING CLASS:	2013 B16.5 1.1 CL.150	PWHT:	
MATERIAL/SPEC:	A106 B / A53 B SMLS	INSP. CLASS:	
C.A.:	0.063	TEMP LIMIT:	-20°F to 400°F
NOTES:	G01	SPECIAL REQ.:	UL/FM Listed

TEMP F	-20	-20	100	200	300	400	400
PSIG	0	285	285	260	230	200	0



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NO	DATE	REVISIONS AND RECORD OF ISSUE	BY	CHK	APP



Item	Notes	NPS1	SCH1 / Rating	NPS2	SCH2 / Rating	Ends	Description	Stockcode
PIPE								
PIPE		0.5 - 2	XS				SCH XS PIPE, A106 Gr. B, SMLS, GALVANIZED	
PIPE		2.5 - 24	40				SCH 40 PIPE, A106 Gr. B, SMLS, GALVANIZED	
NIPPLES								
NIPPLE	G04	0.5 - 2	XS			SW x SCM	SCH XS PIPE NIPPLE, PE X TE, 3" LONG, A106 Gr. B, GALVANIZED	
NIPPLE		2	XS			SW x BE	SCH XS SCH XS PIPE NIPPLE, PE X BE, 3" LONG, A106 Gr B, GALVANIZED	
FITTINGS								
BAR STOCK	G03	0.5 - 2				SW	BAR STOCK, MFR STD, 3" LONG,, A105, GALVANIZED	
CONCENTRIC REDUCER	G08	3	40	2	XS	BW	SCH 40 X SCH XS, CONC RED, A234 Gr WPB, GALVANIZED	
CONCENTRIC REDUCER	G08	3 - 24	40	2.5 - 20		BW	SCH 40, CONC RED, A234 Gr WPB, GALVANIZED	
CONCENTRIC REDUCER	G08	6	40	3	XS	BW	SCH 40 X SCH XS, CONC RED, A234 Gr WPB, GALVANIZED	
CONCENTRIC REDUCER	G08	12 - 18	40	6 - 10	STD	BW	SCH 40 X SCH STD, CONC RED, A234 Gr WPB, GALVANIZED	
CONCENTRIC REDUCER	G08	18	40	10	40S	BW	SCH 40 X SCH 40S, CONC RED, A234 Gr WPB, GALVANIZED	
CONCENTRIC REDUCER	G08	18	40	12 - 16	80S	BW	SCH 40 X SCH 80S, CONC RED, A234 Gr WPB, GALVANIZED	
CONCENTRIC REDUCER	G08	24	40	16 - 20	XS	BW	SCH 40 X SCH XS, CONC RED, A234 Gr WPB, GALVANIZED	
ECCENTRIC REDUCER	G08	3	40	2	XS	BW	SCH 40 X SCH XS, ECC RED, A234 Gr WPB, GALVANIZED	
ECCENTRIC REDUCER	G08	3 - 24	40	2.5 - 20		BW	SCH 40, ECC RED, A234 Gr WPB, GALVANIZED	
ECCENTRIC REDUCER	G08	12 - 18	40	6 - 10	STD	BW	SCH 40 X SCH STD, ECC RED, A234 Gr WPB, GALVANIZED	
ECCENTRIC REDUCER	G08	18	40	10	40S	BW	SCH 40 X SCH 40S, ECC RED, A234 Gr WPB, GALVANIZED	
ECCENTRIC REDUCER	G08	18	40	12 - 16	80S	BW	SCH 40 X SCH 80S, ECC RED, A234 Gr WPB, GALVANIZED	
ECCENTRIC REDUCER	G08	24	40	16 - 20	XS	BW	SCH 40 X SCH XS, ECC RED, A234 Gr WPB, GALVANIZED	
HEX HEAD PLUG	G04	0.5	3000LB			SCM	CL 3000, HEX HEAD PIPE PLUG, THRD, A105, GALVANIZED	
HEX HEAD PLUG	G04	0.75	3000LB			SCM	CL 3000, HEX HEAD PIPE PLUG, SW, A105, GALVANIZED	



Item	Notes	NPS1	SCH1 / Rating	NPS2	SCH2 / Rating	Ends	Description	Stockcode
HEX HEAD PLUG	G04	1 - 2	3000LB			SCM	CL 3000, HEX HEAD PIPE PLUG, THRD, A105, GALVANIZED	
LR 45 ELL		0.5 - 2	3000LB	0.5 - 2		SW	CL 3000, SW 45 ELL, A105, GALVANIZED	
LR 45 ELL	G08	2.5 - 24	40	2.5 - 24		BW	SCH 40, LR 45 ELL, BW, A234 Gr WPB, GALVANIZED	
LR 90 ELL		0.5 - 2	3000LB	0.5 - 2		SW	CL 3000, SW 90 ELL, A105, GALVANIZED	
LR 90 ELL	G08	2.5 - 24	40	2.5 - 24		BW	SCH 40, LR 90 ELL, BW, A234 Gr WPB, GALVANIZED	
PIPE CAP		0.5 - 2	3000LB			SW	CL 3000, PIPE CAP, SW, A105, GALVANIZED	
PIPE CAP	G04	0.5 - 2	3000LB			SCF	CL 3000, PIPE CAP, THRD, A105, GALVANIZED	
PIPE CAP	G08	3 - 8	40			BW	SCH 40 PIPE CAP, A234 Gr WPB, GALVANIZED	
PIPE CAP	G08	10	40			BW	SCH 40 PIPE CAP, BW, A234 Gr WPB, GALVANIZED	
PIPE CAP	G08	12 - 24	40			BW	SCH 40 PIPE CAP, A234 Gr WPB, GALVANIZED	
PIPE FULL COUPLING		0.5 - 2	3000LB			SW	CL 3000, PIPE FULL COUPLING, SW, A105, GALVANIZED	
PIPE UNION	G04	0.5 - 2	3000LB	0.5 - 2		SW	CL 3000, PIPE UNION, SW, A105, GALVANIZED	
REDUCING COUPLING		0.75 - 2	3000LB	0.5 - 1.5		SW	CL 3000, REDUC COUPLING, SW A105, GALVANIZED	
REDUCING TEE		0.75 - 2	3000LB	0.5 - 1.5		SW	CL 3000, SW RED TEE, A105, GALVANIZED	
REDUCING TEE	G08	3 - 24	40	2.5 - 20		BW	SCH 40, BW REDUC TEE, A234 Gr WPB, GALVANIZED	
REDUCING TEE	G08	4	40	3	30	BW	SCH 40 X SCH 30, BW REDUC TEE, A234 Gr WPB, GALVANIZED	
REDUCING TEE	G08	4	40	2.5	80	BW	SCH 40 X SCH 80, BW REDUC TEE, A234 Gr WPB, GALVANIZED	
REDUCING TEE	G08	12 - 16	40	8 - 10	STD	BW	SCH 40 X SCH STD, BW REDUC TEE, A234 Gr WPB, GALVANIZED	
REDUCING TEE	G08	18	40	12 - 16	80S	BW	SCH 40 X SCH 80S, BW REDUC TEE, A234 Gr WPB, GALVANIZED	
REDUCING TEE	G08	24	40	14	STD	BW	SCH 40 X SCH STD, BW REDUC TEE, A234 Gr WPB, GALVANIZED	
REDUCING TEE	G08	24	40	16 - 20	XS	BW	SCH 40 X SCH XS, BW REDUC TEE, A234 Gr WPB, GALVANIZED	
SOCKOLET		2.5 - 24	3000LB	0.5 - 2		SW	CL 3000, SOL, A105 GALVANIZED	
STRAIGHT TEE		0.5 - 2	3000LB	0.5 - 2		SW	CL 3000, SW TEE, A105, GALVANIZED	
STRAIGHT TEE	G08	2.5 - 24	40	2.5 - 24		BW	SCH 40, BW TEE, A234 Gr WPB, GALVANIZED	
THREADOLET	F03	2.5 - 24	3000LB	0.5 - 2		SCF	CL 3000, TOL, A105, GALVANIZED	
WELDOLET	G08	4	40	2.5 - 3	40	BW	SCH 40, WOL, A105, GALVANIZED	
WELDOLET	G08	6 - 24	40	2.5 - 12		BW	SCH 40, WOL, A105, GALVANIZED	



Item	Notes	NPS1	SCH1 / Rating	NPS2	SCH2 / Rating	Ends	Description	Stockcode
WELDOLET	G08	12 - 24	40	3 - 12	STD	BW	SCH 40 X SCH STD, WOL, A105, GALVANIZED	
WELDOLET	G08	18	40	3 - 10	40S	BW	SCH 40 X SCH 40S, WOL, A105, GALVANIZED	
FLANGES								
BLIND FLANGE	G08	0.5 - 24	150LB	0.5 - 24		FF	CL 150, FF BLIND FLG, A105, GALVANIZED	
BLIND FLANGE	G08	0.5 - 24	150LB	0.5 - 24		RF	CL 150, RF BLIND FLG, A105, GALVANIZED	
LWN FLANGE		1.5	150LB	1.5		RF x BW	CL 150, RF LWN FLG, 4.5" LONG, (SCH XS BORE), A105, GALVANIZED	
ORIFICE FLANGE	G08	2	300LB	2		RF x BW	CL 300, RF ORIFICE FLG, (SCH XS BORE), A105, GALVANIZED	
ORIFICE FLANGE	G08	2.5 - 24	300LB	2.5 - 24		RF x BW	CL 300, RF ORIFICE FLG, (SCH STD BORE), A105, GALVANIZED	
THRD FLANGE	G08	0.5 - 2	150LB	0.5 - 2		FF x SCF	CL 150, FF THRD FLG, A105, GALVANIZED	
THRD FLANGE	G08	0.5 - 2	150LB	0.5 - 2		RF x SCF	CL 150, RF THRD FLG, A105, GALVANIZED	
WN FLANGE	G08	2.5 - 24	150LB	2.5 - 24		RF x BW	CL 150, RF WN FLG, (SCH STD BORE), A105, GALVANIZED	
WN FLANGE	G08	3 - 24	150LB	3 - 24		FF x BW	CL 150, FF WN FLG, (SCH STD BORE), A105, GALVANIZED	
BOLTING								
STUD BOLT		2.5 - 24	150LB			FF	STUD BOLTS, W/ 2 HEAVY HEX HEAD NUTS, A307 GRADE B / A563 GRADE B	
STUD BOLT		2.5 - 24	150LB			RF	STUD BOLTS, W/ 2 HEAVY HEX NUTS, A193 Gr B7 / A194 GRADE 2H	
STUD BOLT		2.5 - 24	300LB			RF	STUD BOLTS, W/ 2 HEAVY HEX NUTS, A193 Gr B7 / A194 GRADE 2H	
GASKETS								
GASKET		0.5 - 24	150LB			FF	0.0625" THK, CL 150, FF COMPRESSED FIBER FULL FACE GASKET, NONASBESTOS	
GASKET		0.5 - 2	150LB			RF	0.0625" THK, CL 150, RF COMPRESSED FIBER RING GASKET, NONASBESTOS	
GASKET		2.5 - 24	150LB			RF	0.125" THK, CL 150, RF SPIRAL WOUND GASKET, RF, SS FILLER	
GASKET		2.5 - 24	300LB			RF	0.125" THK, CL 300, RF SPIRAL WOUND GASKET, RF, SS FILLER	
ORIFICE_PLATE								
FLOW ORIFICE PLATE		2 - 24	300LB			RF x WAF	CL 300, FLOW ORIFICE PLATE, A105	
VALVE								
GATE VALVE		0.5 - 2	800LB			SCF	CL 800, FNPT GATE VALVE, A105, FP, BB, OS&Y, RS, HARD FACED, HANDWHEEL, MANUFACTURER STANDARD PACKING, BONNET VENT UPSTREAM, B7/2H BOLTING, B16.34	



Item	Notes	NPS1	SCH1 / Rating	NPS2	SCH2 / Rating	Ends	Description	Stockcode
GATE VALVE		2.5 - 4	CL 150	2.5 - 4		BW	CL 150, BW (SCH 40 BORE), GATE VALVE, A216 WCB, FLEXIBLE WEDGE, HANDWHEEL, BB, OS&Y, HARD FACED, MANUFACTUER STANDARD PACKING, BONNET VENT UPSTREAM, B7/2H BOLTING, B16.34	
GATE VALVE		6 - 24	CL 150	6 - 24		BW	CL 150, BW (SCH 40 BORE), GATE VALVE, A216 WCB, FLEXIBLE WEDGE, WORM TYPE GEAR OPERATOR, BB, OS&Y, HARD FACED, MANUFACTUER STANDARD PACKING, BONNET VENT UPSTREAM, B7/2H BOLTING, B16.34	
GLOBE VALVE		0.5 - 2	800LB			SCF	CL 800, FNPT GLOBE VALVE, A105, FP, BB, OS&Y, RS, HARD FACED, HANDWHEEL, MANUFACTURER STANDARD PACKING, B7/2H BOLTING, B16.34	
GLOBE VALVE		2.5 - 4	CL 150	2.5 - 4		BW	CL 150, BW (SCH 40 BORE), GLOBE VALVE, A216 WCB, BB, HANDWHEEL, HARD FACED, OS&Y, MANUFACTURER STANDARD PACKING, B7/2H BOLTING, B16.34	
GLOBE VALVE		6 - 24	CL 150	6 - 24		BW	CL 150, BW (SCH 40 BORE), GLOBE VALVE, A216 WCB, BB, WORM TYPE GEAR OPERATOR, HARD FACED, OS&Y, MANUFACTURER STANDARD PACKING, B7/2H BOLTING, B16.34	
PISTON CHECK VALVE		0.5 - 2	800LB			SCF	CL 800, FNPT PISTON CHECK VALVE, A105, SPRING ACTUATED PISTON CHECK TYPE, HARD FACED, BB, B7/2H BOLTING, B16.34	
SWING CHECK VALVE		2.5 - 24	150LB	3 - 24		BW	CL 150, BW (SCH 40 BORE), SWING CHECK VALVE, A216 WCB, BOLTED COVER, SWING CHECK, HARD FACED, BB, B7/2H BOLTING, B16.34	

NOTES:

- F03 Thredolets shall be used for hydrostatic vents only and shall be plugged and seal welded after successful completion of testing.
- G01 Addition or substitution of components (material A vs. material B, welded vs. seamless, etc.) in this piping class requires approval from the Piping Engineer.
- G03 Secondary component. Shall be used only when necessary.



G04 Threaded components are permitted only at outlet of vent, drain, and instrument valves and to match equipment.

G08 Component wall thickness and end preparation type to be the same as the pipe. .

90° BRANCH CONNECTION

BRANCH	24	T																		
	20	R	T																	
	18	R	R	T																
	16	R	R	R	T															
	14	R	R	R	R	T														
	12	W	R	R	R	R	T													
	10	W	W	W	R	R	R	T												
	8	W	W	W	W	R	R	R	T											
	6	W	W	W	W	W	W	R	R	T										
	4	W	W	W	W	W	W	W	W	R	T									
	3	W	W	W	W	W	W	W	W	W	R	T								
	2.5	W	W	W	W	W	W	W	W	W	R	T								
	2	S	S	S	S	S	S	S	S	S	S	T								
	1.5	S	S	S	S	S	S	S	S	S	S	S	R	T						
	1	S	S	S	S	S	S	S	S	S	S	S	S	R	R	T				
0.75	S	S	S	S	S	S	S	S	S	S	S	S	R	R	R	T				
0.5	S	S	S	S	S	S	S	S	S	S	S	S	R	R	R	R	T			
	24	20	18	16	14	12	10	8	6	4	3	2.5	2	1.5	1	0.75	0.5			
HEADER																				

R = TEE (REDUCING)
S = SOCKOLET
T = TEE
W = WELDOLET

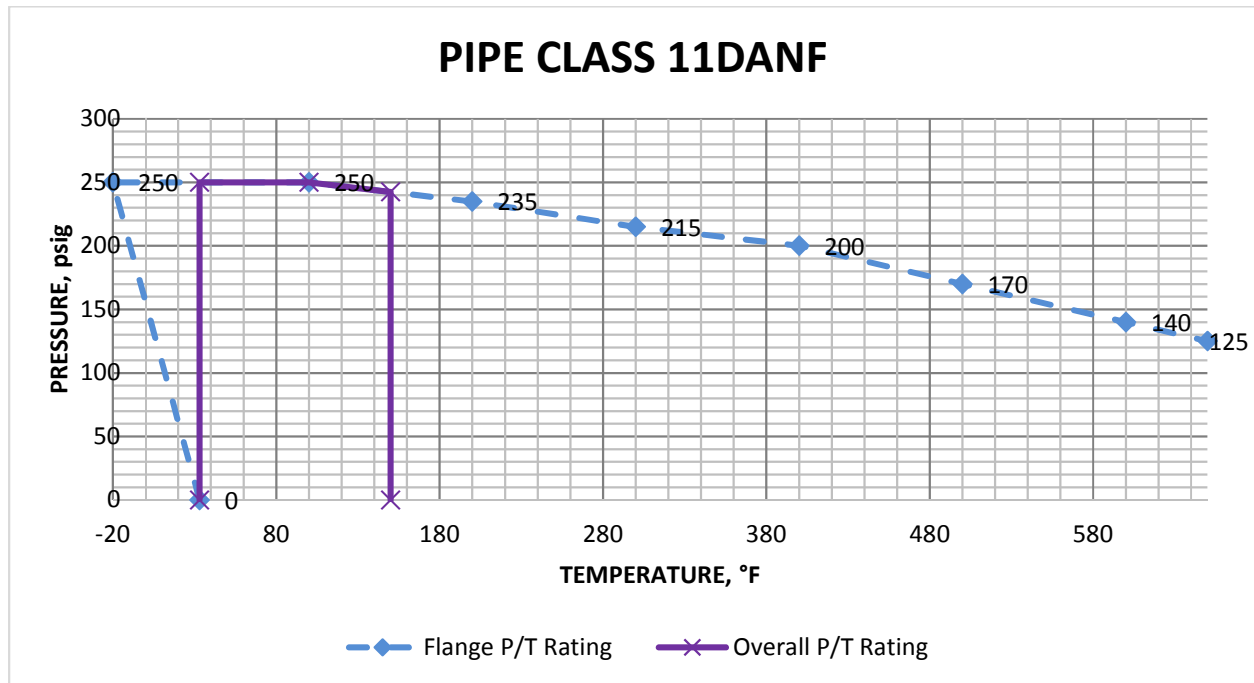
STANDARD PIPING ASSEMBLIES*					
VENTS, DRAINS AND INSTRUMENT CONNECTIONS					
HYDROTEST VENT	HYDROTEST DRAIN	PRESSURE INSTRUMENT	TEMPERATURE INSTRUMENT	LEVEL GAUGE DRAIN	DP LEVEL TRANSMITTER
V1	D1	P1	T1		L1
DM-5301	DM-5301	DM-5303	DM-5304		DM-5305
FLOW ELEMENT V-CONE LIQUID	FLOW ELEMENT V-CONE LIQUID				

• SEE _____ FOR ASSEMBLY DETAILS.



SERVICES: U/G Fire Water (null) Fire Water (WF)		REMARKS: 1. This PMC is designed for the full flange rating within the temperature limit. 2. Underground service only. 3. All components in this PMC shall be UL/FM Approved for underground fire service.			
DESIGN CODE:	ASME B31.1		SIZE RANGE:	NPS 3 to 24	
RATING CLASS:	2011 B16.42 CL.150		PWHT:		
MATERIAL/SPEC:	DI, CEMENT-MORTAR LINED		INSP. CLASS:		
C.A.:	0		TEMP LIMIT:	33°F to 150°F	
NOTES:	G01, 603		SPECIAL REQ.:	Cement-Mortar lined, UL/FM Approved, UL / FM Approved - Cement lined, PE encased	

TEMP F	33	33	100	150	150
PSIG	0	250	250	242.5	0



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NO	DATE	REVISIONS AND RECORD OF ISSUE	BY	CHK	APP



Item	Notes	NPS1	SCH1 / Rating	NPS2	SCH2 / Rating	Ends	Description	Stockcode
PIPE								
PUSH-FIT PIPE		3 - 12	350LB			PE	CL 350, DUCTILE IRON PIPE, PE x PE, AWWA C151/A21.51, UL/FM APPROVED	
PUSH-FIT PIPE		14 - 20	250LB			PE	CL 250, DUCTILE IRON PIPE, PE x PE, AWWA C151/A21.51	
PUSH-FIT PIPE		24	200LB			PE	CL 200, DUCTILE IRON PIPE, PE x PE, AWWA C151/A21.51	
PUSH-FIT PIPE		24	200LB			PFS x PE	CL 200, DUCTILE IRON PIPE, POJ x PE, AWWA C151/A21.51	
FITTING								
11.25 ELL	604	3 - 16	350LB	3 - 16		MJF	CL 350, 11.25 ELL, MJ, AWWA C153/A21.53	
11.25 ELL		18 - 24	350LB	18 - 24		MJF	CL 350, 11.25 ELL, MJ, AWWA C110/A21.10	
CONCENTR IC PIPE REDUCER	604	4 - 16	350LB	3 - 14		MJF	CL 350, CONC REDUCER, MJ, AWWA C153/A21.53	
CONCENTR IC PIPE REDUCER		18 - 24	350LB	8 - 20		MJF	CL 350, CONC REDUCER, MJ, AWWA C110/A21.10	
ECCENTRI C PIPE REDUCER	604	6 - 16	350LB	4 - 14		MJF	CL 350, ECC REDUCER, MJ, AWWA C153/A21.53	
ECCENTRI C PIPE REDUCER		18 - 24	350LB	8 - 20		MJF	CL 350, ECC REDUCER, MJ, AWWA C110/A21.10	
EQUAL PIPE LATERAL TEE		4 - 24	250LB	4 - 24		MJF	CL 250, EQUAL PIPE LATERAL TEE, MJ, AWWA C110/A21.10	
LR 22.5 ELL	604	3 - 16	350LB	3 - 16		MJF	CL 350, LR 22.5 ELL, MJ, AWWA C153/A21.53	
LR 22.5 ELL		18 - 24	350LB	18 - 24		MJF	CL 350, LR 22.5 ELL, MJ, AWWA C110/A21.10	
LR 45 ELL	604	3 - 16	350LB	3 - 16		MJF	CL 350, LR 45 ELL, MJ, AWWA C153/A21.53	
LR 45 ELL		18 - 24	350LB	18 - 24		MJF	CL 350, LR 45 ELL, MJ, AWWA C110/A21.10	
LR 90 ELL	604	3 - 16	350LB	3 - 16		MJF	CL 350, LR 90 ELL, MJ, AWWA C153/A21.53	
LR 90 ELL		18 - 24	350LB	18 - 24		MJF	CL 350, LR 90 ELL, MJ, AWWA C110/A21.10	
PIPE ADAPTER		3 - 24	250LB	3 - 24		FF x PE	CL 250, PIPE ADAPTER, FL x PE, AWWA C110/A21.10	
PIPE ADAPTER		3 - 24	250LB	3 - 24		MJF x FF	CL 250, PIPE ADAPTER, MJ x FL, AWWA C110/A21.10	
PIPE ADAPTER		3 - 12	350LB	3 - 12		FF x PE	CL 350, PIPE ADAPTER, FL x PE, DI, UL/FM APPROVED	
PIPE CAP		3 - 16	350LB			MJF	CL 350, PIPE CAP, MJ, AWWA C153/A21.53	
PIPE CAP		18 - 24	350LB			MJF	CL 350, PIPE CAP, MJ, AWWA C153/A21.53	
PIPE LATERAL RED. BRANCH		6 - 24	250LB	4 - 20		MJF	CL 250, PIPE LATERAL RED. BRANCH, MJ, AWWA C110/A21.10	
REDUCING TEE	604	4 - 16	350LB	3 - 12		MJF	CL 350, MJ REDUCING TEE, DI, AWWA C153/A21.53	
REDUCING TEE		18 - 24	350LB	6 - 20		MJF	CL 350, MJ REDUCING TEE, DI, AWWA C110/A21.10	



Item	Notes	NPS1	SCH1 / Rating	NPS2	SCH2 / Rating	Ends	Description	Stockcode
REDUCING TEE		18 - 24	350LB	6 - 20		MJF	CL 350, MJ X PE REDUCING TEE, DI,AWWA C110/A21.10	
STRAIGHT TEE		4 - 12	250LB	4 - 12		FF	CL 250, FL STRAIGHT TEE, DI,AWWA C110/A21.10, UL/FM APPROVED	
STRAIGHT TEE	604	4 - 16	350LB	4 - 16		MJF	CL 350, MJ STRAIGHT TEE, DI,AWWA C153/A21.53	
STRAIGHT TEE	604	4 - 16	350LB	4 - 16		MJF	CL 350, MJ X PE STRAIGHT TEE, DI,AWWA C153/A21.53	
STRAIGHT TEE		18 - 24	350LB	18 - 24		MJF	CL 350, MJ STRAIGHT TEE, DI,AWWA C110/A21.10	
STRAIGHT TEE		18 - 24	350LB	18 - 24		MJF	CL 350, MJ X PE STRAIGHT TEE, DI,AWWA C110/A21.10	
GASKETS								
GASKET		3 - 12	250LB			FF	0.125" THK CL 250, FF GASKET, RUBBER,, 1/8" THICK, 250 PSI RATING, AWWA C111	
GASKET		5	250LB			FF	0.125" THK CL 250, FF GASKET, RUBBER,, 1/8" THICK, 250 PSI RATING, AWWA C111	
MECHANICAL JOINT KIT		4 - 24	350LB				CL 350 DIPS MECH JOINT KIT	
Stud Bolt		3 - 12	250LB			FF	STUD BOLTS, AWWA C115, ASTM A307-B W/ A563-A HEAVY HEX NUTS, CADMIUM PLATED	
VALVE								
GATE VALVE		4	250LB			FF	CL 250, FF GATE VALVE,DI, WITH VALVE BOX	

NOTES:

- 603 Minimum Type "3" laying condition required (ANSI/AWWA C151/A21.51).
- 604 Ductile-Iron fittings in accordance with AWWA C110/ANSI A21.10 are an acceptable alternate to AWWA C153/ANSI A21.53 fittings in NPS 3 – 16.
- G01 Addition or substitution of components (material A vs. material B, welded vs. seamless, etc.) in this piping class requires approval from the Piping Engineer.

90° BRANCH CONNECTION

- R = TEE (REDUCING)
- S = SOCKOLET
- T = TEE
- W = WELDOLET



BRANCH	24	T																
	20	R	T															
	18	R	R	T														
	16	R	R	R	T													
	14	R	R	R	R	T												
	12	W	R	R	R	R	T											
	10	W	W	W	R	R	R	T										
	8	W	W	W	W	R	R	R	T									
	6	W	W	W	W	W	W	R	R	T								
	4	W	W	W	W	W	W	W	W	R	T							
	3	W	W	W	W	W	W	W	W	W	R	T						
	2.5	W	W	W	W	W	W	W	W	W	W	R	T					
	2	S	S	S	S	S	S	S	S	S	S	S	T					
	1.5	S	S	S	S	S	S	S	S	S	S	S	R	T				
	1	S	S	S	S	S	S	S	S	S	S	S	R	R	T			
	0.75	S	S	S	S	S	S	S	S	S	S	S	R	R	R	T		
	0.5	S	S	S	S	S	S	S	S	S	S	S	R	R	R	R	T	
		24	20	18	16	14	12	10	8	6	4	3	2.5	2	1.5	1	0.75	0.5
HEADER																		

STANDARD PIPING ASSEMBLIES*					
VENTS, DRAINS AND INSTRUMENT CONNECTIONS					
HYDROTEST VENT	HYDROTEST DRAIN	PRESSURE INSTRUMENT	TEMPERATURE INSTRUMENT	LEVEL GAUGE DRAIN	DP LEVEL TRANSMITTER
V1	D1	P1	T1		L1
DM-5301	DM-5301	DM-5303	DM-5304		DM-5305
FLOW ELEMENT V-CONE LIQUID	FLOW ELEMENT V-CONE LIQUID				

- SEE _____ FOR ASSEMBLY DETAILS.



KENNEDY GENERATING STATION

B&V PROJECT 197990

FIRE PROTECTION LOOP REPLACEMENT

PROJECT DRAWING LIST

GENERAL DRAWINGS

197990-CUUU-G0000 - FIRE PROTECTION LOOP REPLACEMENT - COVER SHEET

CIVIL DRAWINGS

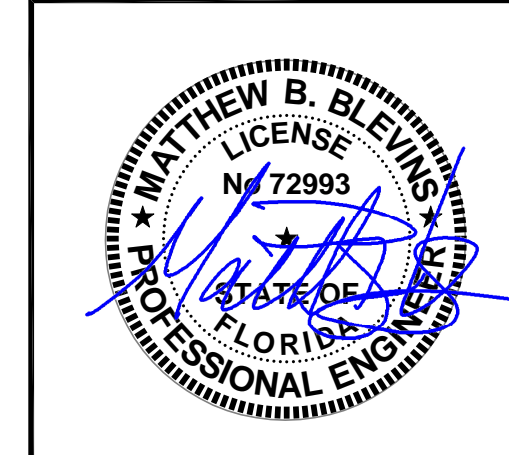
197990-CSTG-S5000 - PIPE TRENCH PLAN, SECTIONS & DETAILS

MECHANICAL DRAWINGS

- 197990-CSTG-M2000 - PIPING & INSTRUMENT DIAGRAM - FIRE PROTECTION LOOP REPLACEMENT
- 197990-CSTG-M3000 - PIPING GENERAL ARRANGEMENT
- 197990-CSTG-M3001 - PIPING ARRANGEMENT
- 197990-CSTG-M3002 - PIPING ARRANGEMENT
- 197990-CSTG-M3003 - PIPING ARRANGEMENT
- 197990-CSTG-M3004 - PIPING ARRANGEMENT
- 197990-CSTG-M3005 - PIPING ARRANGEMENT
- 197990-CSTG-M3006 - PIPING ARRANGEMENT
- 197990-CSTG-M3007 - PIPING ARRANGEMENT
- 197990-CSTG-M3008 - PIPING ARRANGEMENT
- 197990-CSTG-M3050 - PIPING SECTIONS AND DETAILS
- 197990-CSTG-M7000 - PIPE SUPPORTS

18.2s (US, Top)
09/07/17 15:48:18

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NO	DATE	REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	PDE	APP
0	01/AUG/2018	APPROVED FOR CONSTRUCTION	DAS	DAS	JAC	MBB	TPD

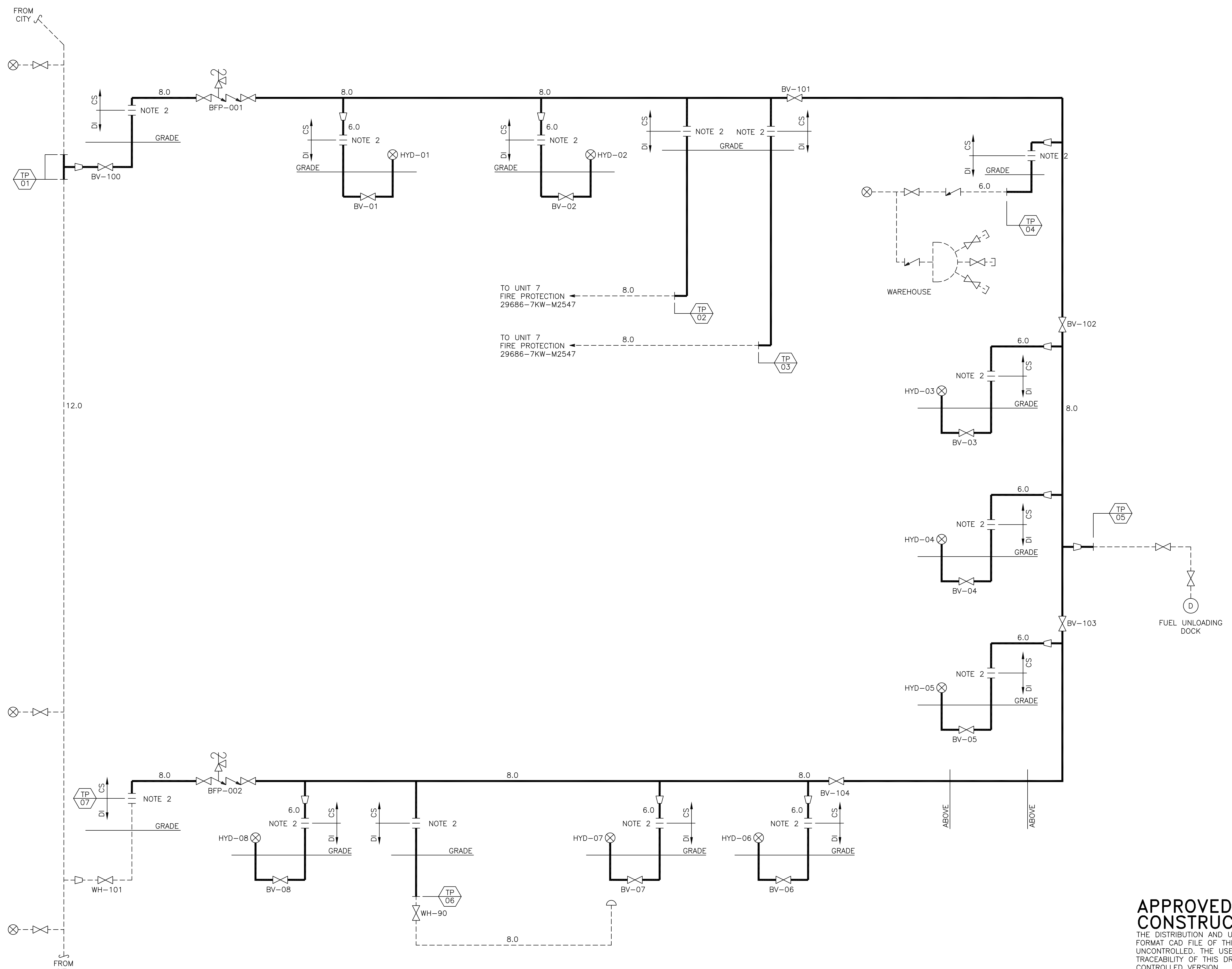
	2240, Gulf Breeze Parkway, Suite 2100 Gulf Breeze, Florida 32562 CERTIFICATE OF AUTHORIZATION No. 1512
ENGINEER: MBB	DRAWN: DAS
CHECKED: JAC	DATE: 01/AUG/2018

JEA KENNEDY GENERATING STATION		PROJECT NUMBER: 197990-CUUU-G0000	DRAWING NUMBER: 0	REV 0
FIRE PROTECTION LOOP REPLACEMENT COVER SHEET		CODE:	REFERENCE DWG NUMBER:	
AREA:				

1. SYSTEM CODE IS CSTG EXCEPT AS INDICATED.
2. ALL BELOW GRADE TRANSITIONS SHALL BE PROVIDED WITH FLANGE ISOLATION KITS.

LEGEND

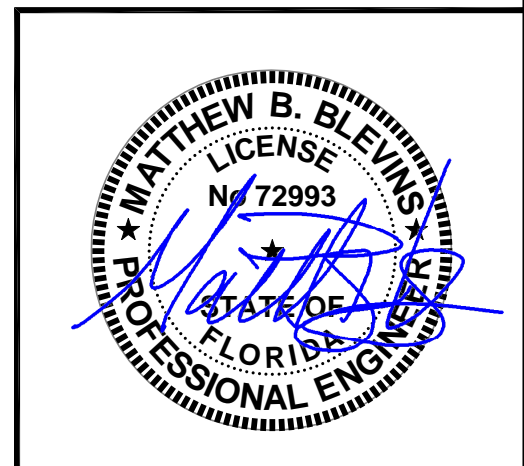
- NEW
- EXISTING
- QUICK DISCONNECT
- FIRE HYDRANT
- INSULATING FLANGE



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SYMS2704 ACAD 1=1 08/01/18 14:31:15 18.2s (LMS Tech) 22 x 34

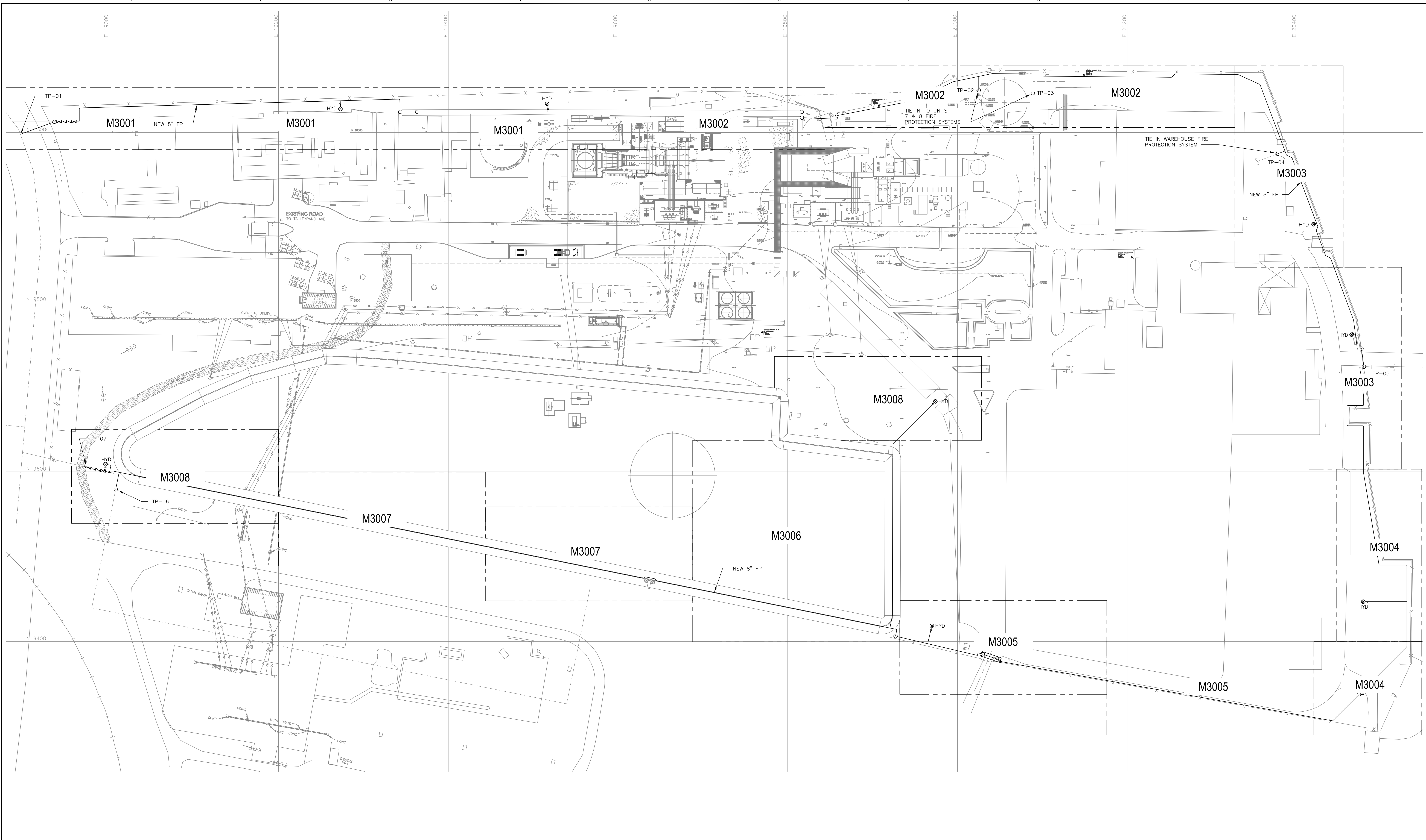
0	01/AUG/2018	APPROVED FOR CONSTRUCTION	DAS	DAS	JAC	MBB	TPD
NO	DD/MM/YYYY	REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	PDE	APP

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BLACK & VEATCH
 12740 Gran Bay Parkway West
 Suite 2140
 Jacksonville, Florida 32258
 CERTIFICATE OF AUTHORIZATION
 NO. 8132

ENGINEER: MBB
 DRAWN: DAS
 CHECKED: JAC
 DATE: 01/AUG/2018

JEA		PROJECT NUMBER:	DRAWING NUMBER:	REV
KENNEDY GENERATING STATION		197990-CSTG-M2000		0
FIRE PROTECTION LOOP REPLACEMENT		CODE:	REFERENCE DWG NUMBER:	
PIPING & INSTRUMENT DIAGRAM		AREA:		



REFERENCE DRAWINGS

NOTES

1. FOR GENERAL NOTES SEE DRAWING M3001.

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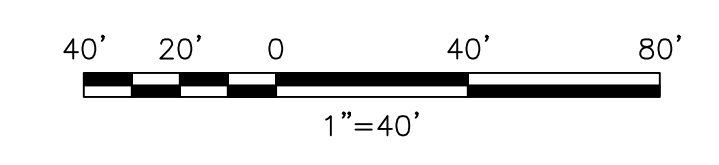
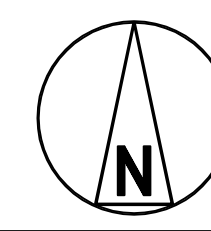
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JEA
KENNEDY GENERATING STATION
FIRE PROTECTION LOOP REPLACEMENT
PIPING GENERAL ARRANGEMENT

PROJECT NUMBER: 197990-CSTG-M3000
DRAWING NUMBER: 0
REV: 0
CODE: REFERENCE DWG NUMBER:
AREA:

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SYN2704
ASCD
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NO	DATE	REVISIONS AND RECORD OF ISSUE	DAS	DAS	JAC	MBB	TPD
0	01/AUG/2018	APPROVED FOR CONSTRUCTION	DAS	DAS	JAC	MBB	TPD
NO			DRN	DES	CHK	PDE	APP

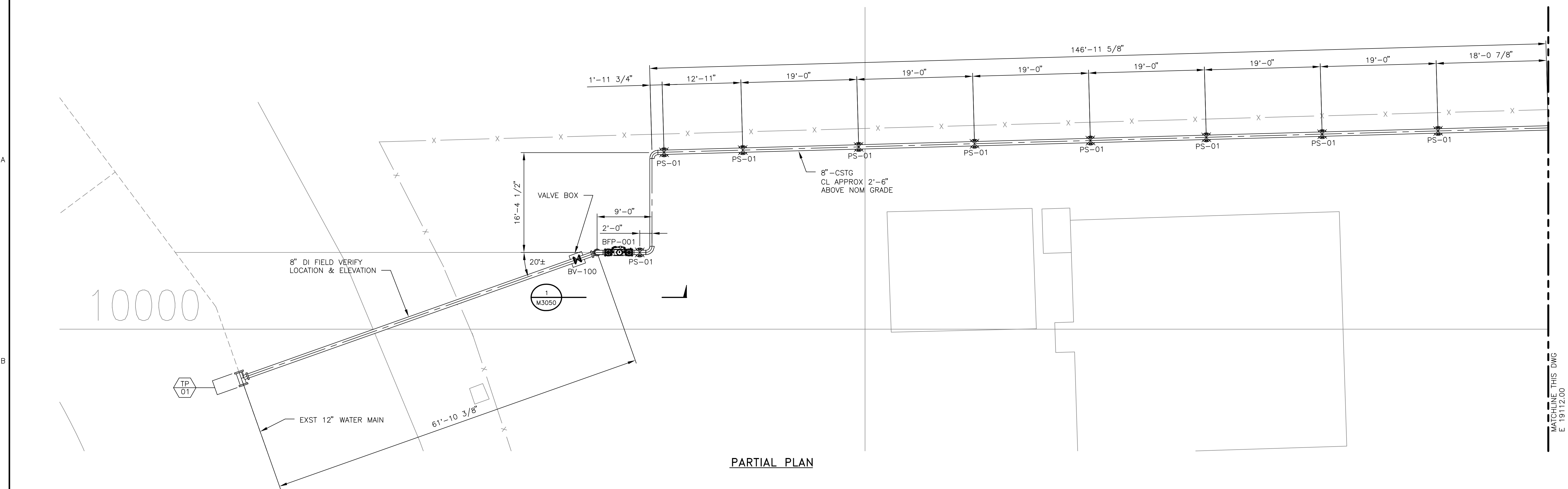


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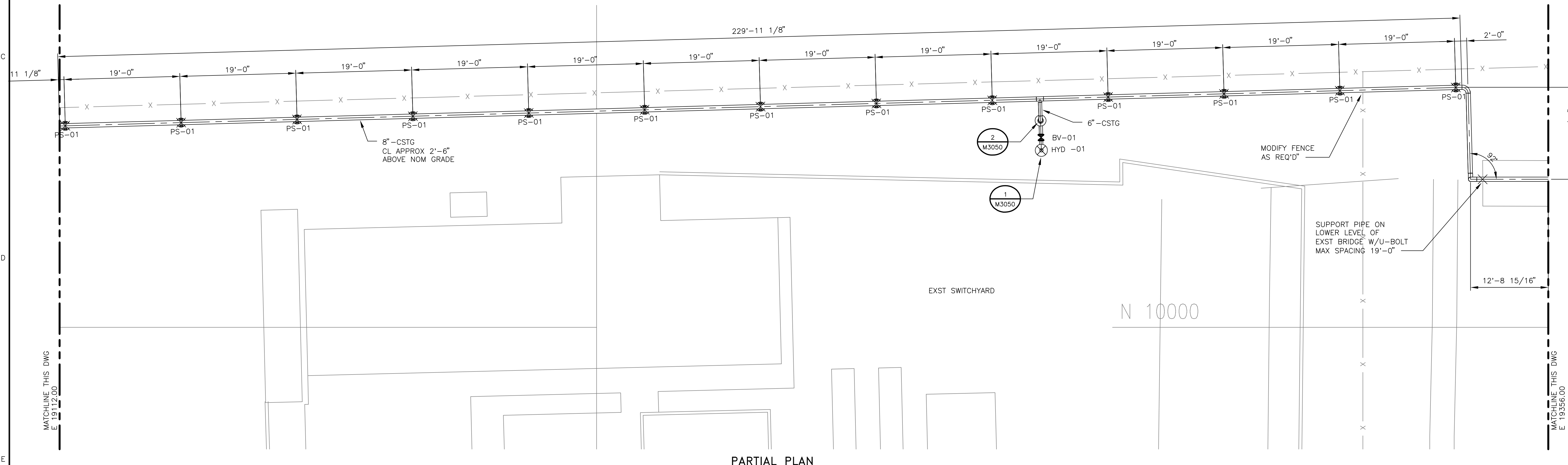
BLACK & VEATCH
2240, East Bay Parkway West
Suite 2140
Boca Raton, Florida 33433
CERTIFICATE OF AUTHORIZATION
No. 1512

ENGINEER: MBB
DRAWN: DAS
CHECKED: JAC
DATE: 01/AUG/2018

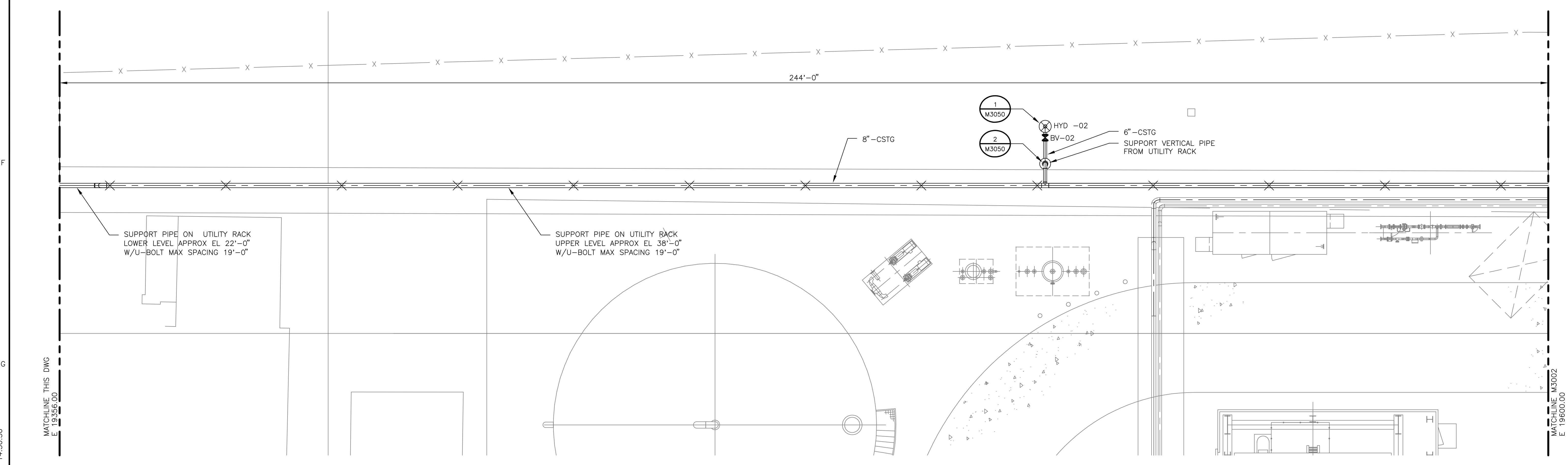
TIE POINT LIST		
TP	DESCRIPTION	REMARKS
01	8" CONNECTION	EXISTING 12" FIRE MAIN FIELD LOCATE
02	8" CONNECTION	EXISTING UNIT 7/8 SUPPLY
03	8" CONNECTION	EXISTING UNIT 7/8 SUPPLY
04	6" CONNECTION	EXISTING WAREHOUSE FIRE PROTECTION
05	2 1/2" CONNECTION	EXISTING PIER FIRE PROTECTION
06	6" CONNECTION	FIELD ROUTE TO EXISTING WH-90 VALVE
07	8" CONNECTION	EXISTING 8" FIRE MAIN FIELD LOCATE



PARTIAL PLAN



PARTIAL PLAN



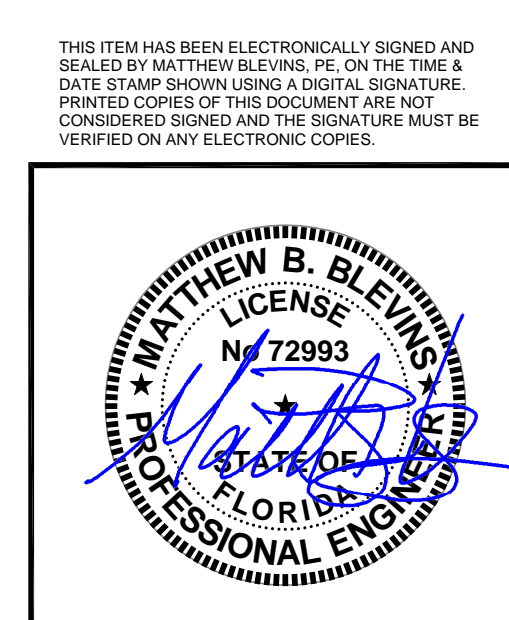
PARTIAL PLAN

GENERAL NOTES

- CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND ELEVATIONS PRIOR TO FABRICATION AND ERECTION.
- ALL NEW PIPING SUPPLIED PER MATERIAL SPECIFICATIONS 11CE2F (CS) AND 11DANF (D).
- ALL PIPING 2" AND SMALLER SHALL BE FIELD ROUTED AND FIELD SUPPORTED IN APPROXIMATE LOCATION AS SHOWN ON THE DRAWINGS.

APPROVED FOR CONSTRUCTION

JEA
KENNEDY GENERATING STATION
FIRE PROTECTION LOOP REPLACEMENT
PIPING ARRANGEMENT



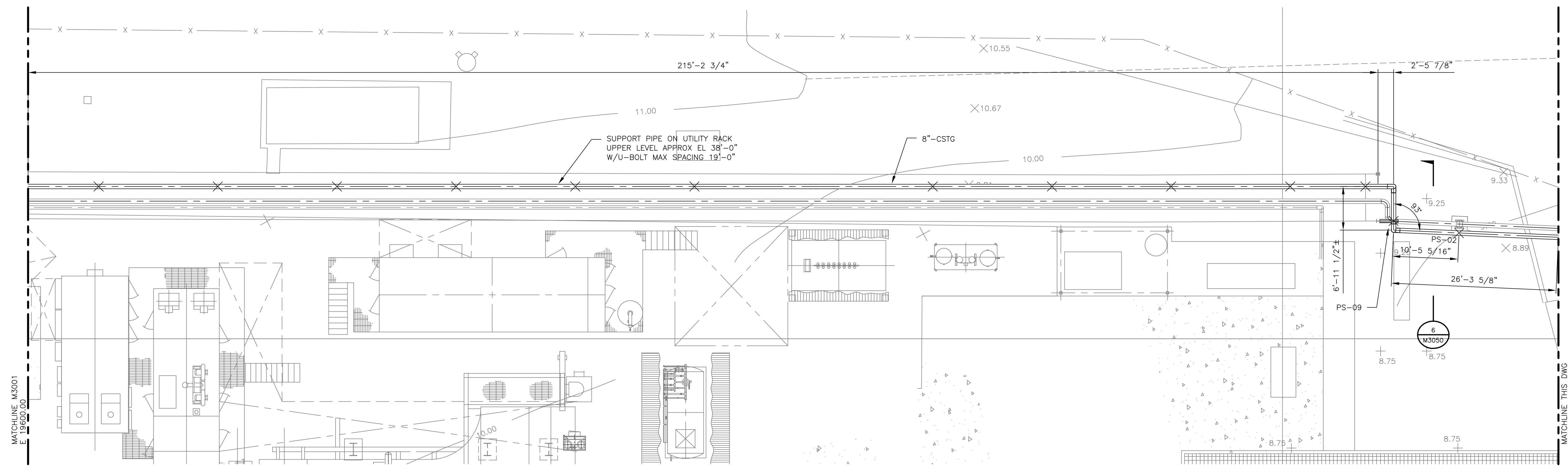
BLACK & VEATCH
2245 Oak Bay Parkway, West
Houston, Texas 77058
A Division of AMEC
CHECKED: JAC DATE: 01/AUG/2018

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1/8" = 1'-0"

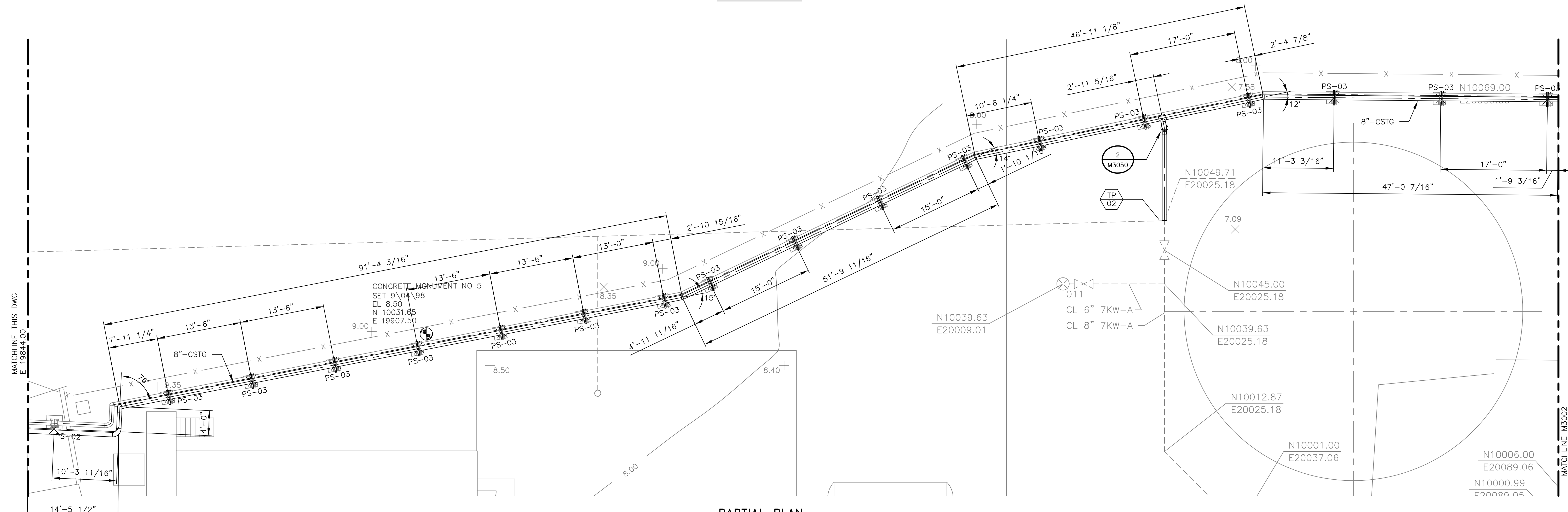
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0	01/AUG/2018	APPROVED FOR CONSTRUCTION	DAS	DAS	JAC	MBB	TPD

SYN2704
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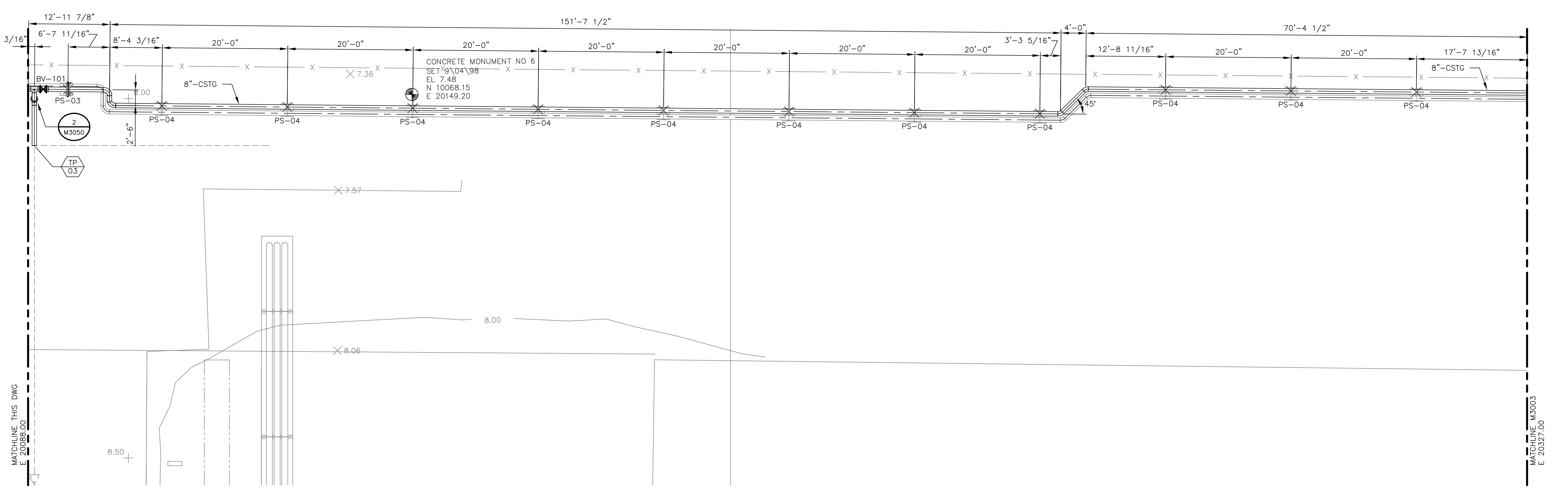
PROJECT NUMBER: 197990-CSTG-M3001	DRAWING NUMBER: 0	REV: 0
CODE:	REFERENCE DWG NUMBER:	AREA:



PARTIAL PLAN



PARTIAL PLAN



PARTIAL PLAN

NOTES

1. FOR GENERAL NOTES SEE DRAWING M3001.

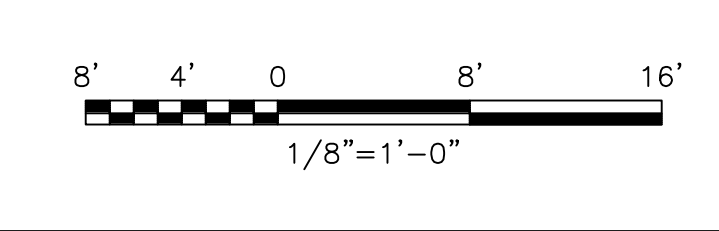
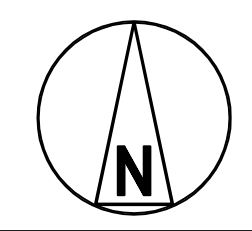
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JEA KENNEDY GENERATING STATION FIRE PROTECTION LOOP REPLACEMENT PIPING ARRANGEMENT		PROJECT NUMBER: 197990-CSTG-M3002	DRAWING NUMBER: 0
ENGINEER: MBB CHECKED: JAC	DRAWN: DAS DATE: 01/AUG/2018	CODE: AREA:	REFERENCE DWG NUMBER:

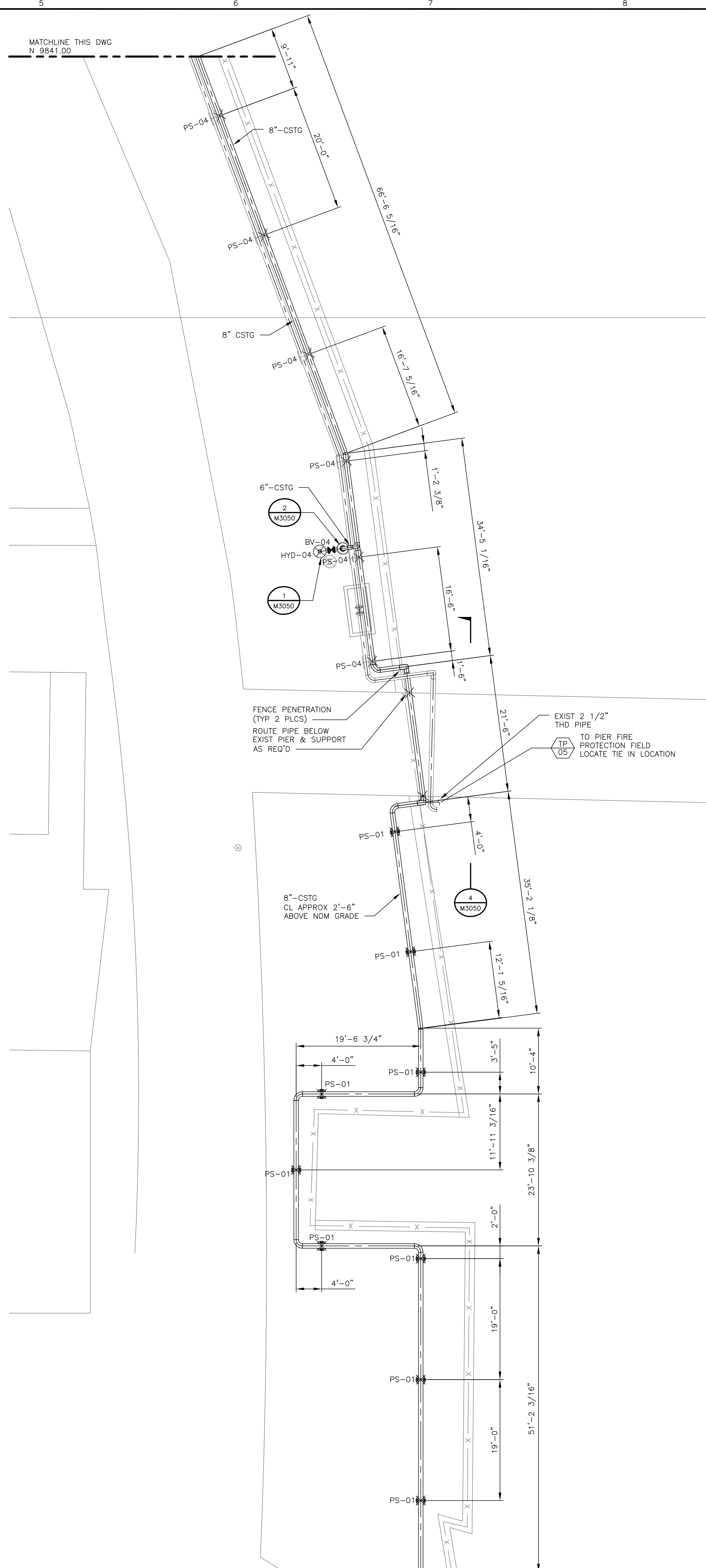
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NO	DATE	REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	PDE	APP
0	01/AUG/2018	APPROVED FOR CONSTRUCTION	DAS	DAS	JAC	MBB	TPD
NO							



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2240, East Bay Parkway West
 Overland Park, Kansas 66208
 CERTIFICATE OF AUTHORIZATION
 No. 18132



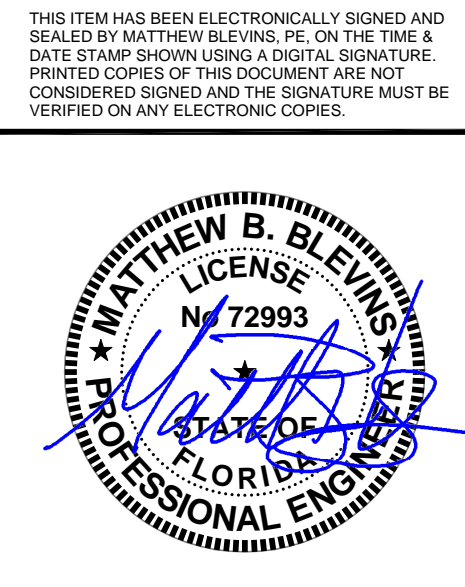
NOTES

1. FOR GENERAL NOTES SEE DRAWING M3001.

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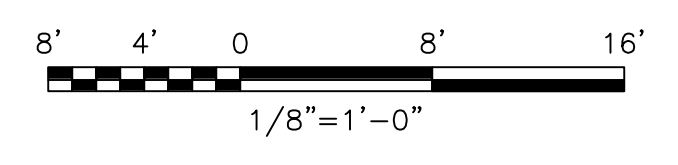
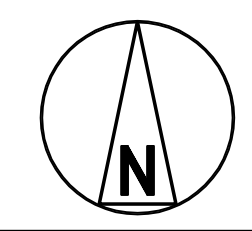
APPROVED FOR CONSTRUCTION

JEA
KENNEDY GENERATING STATION
FIRE PROTECTION LOOP REPLACEMENT
PIPING ARRANGEMENT



16.2s (US Imp) 18.2s (US Imp) 18.2s (US Imp)
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 18.2s (US Imp)
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NO	0	01/AUG/2018	APPROVED FOR CONSTRUCTION	DAS	DAS	JAC	MBB	TPD
		DATE	REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	PDE	APP

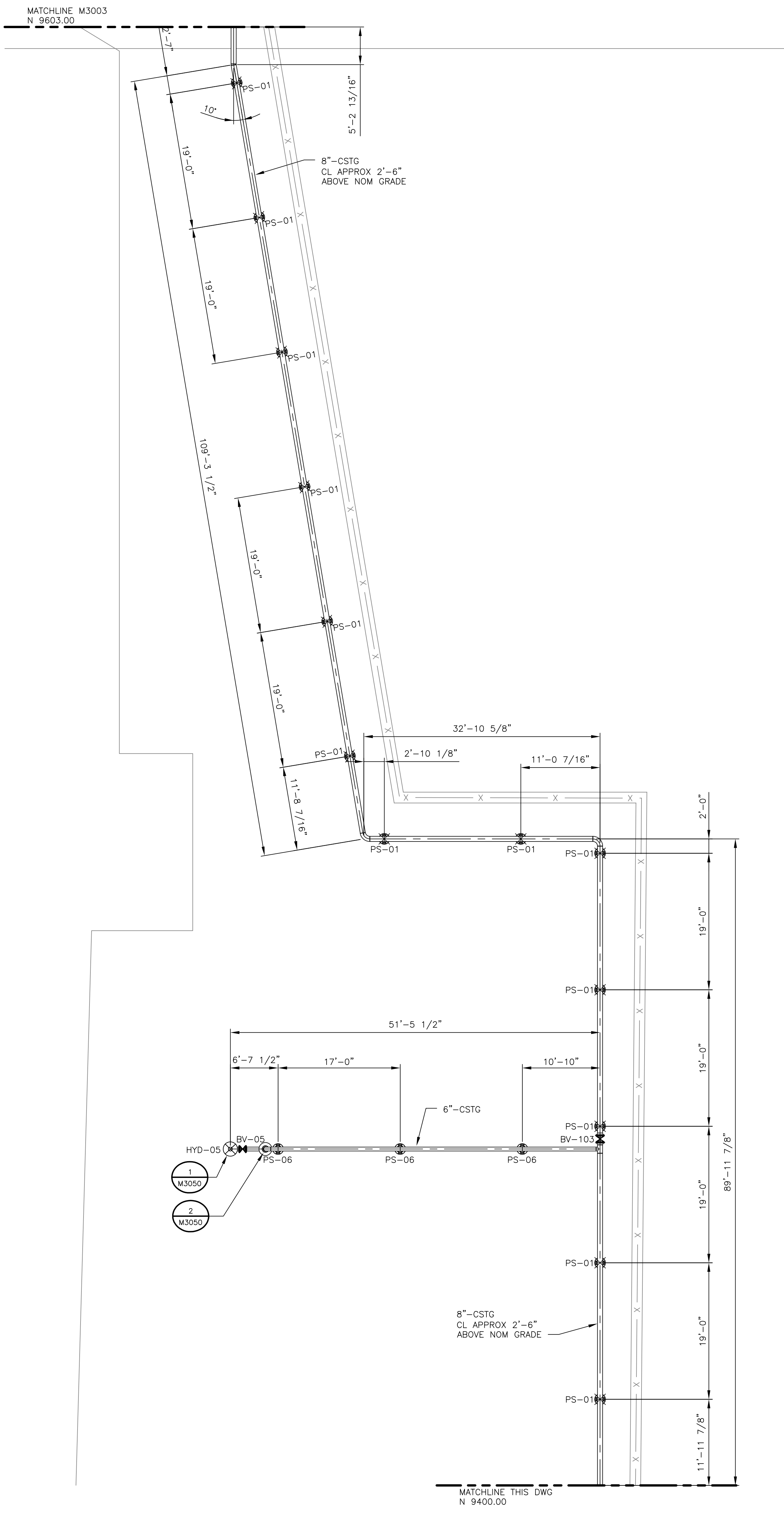


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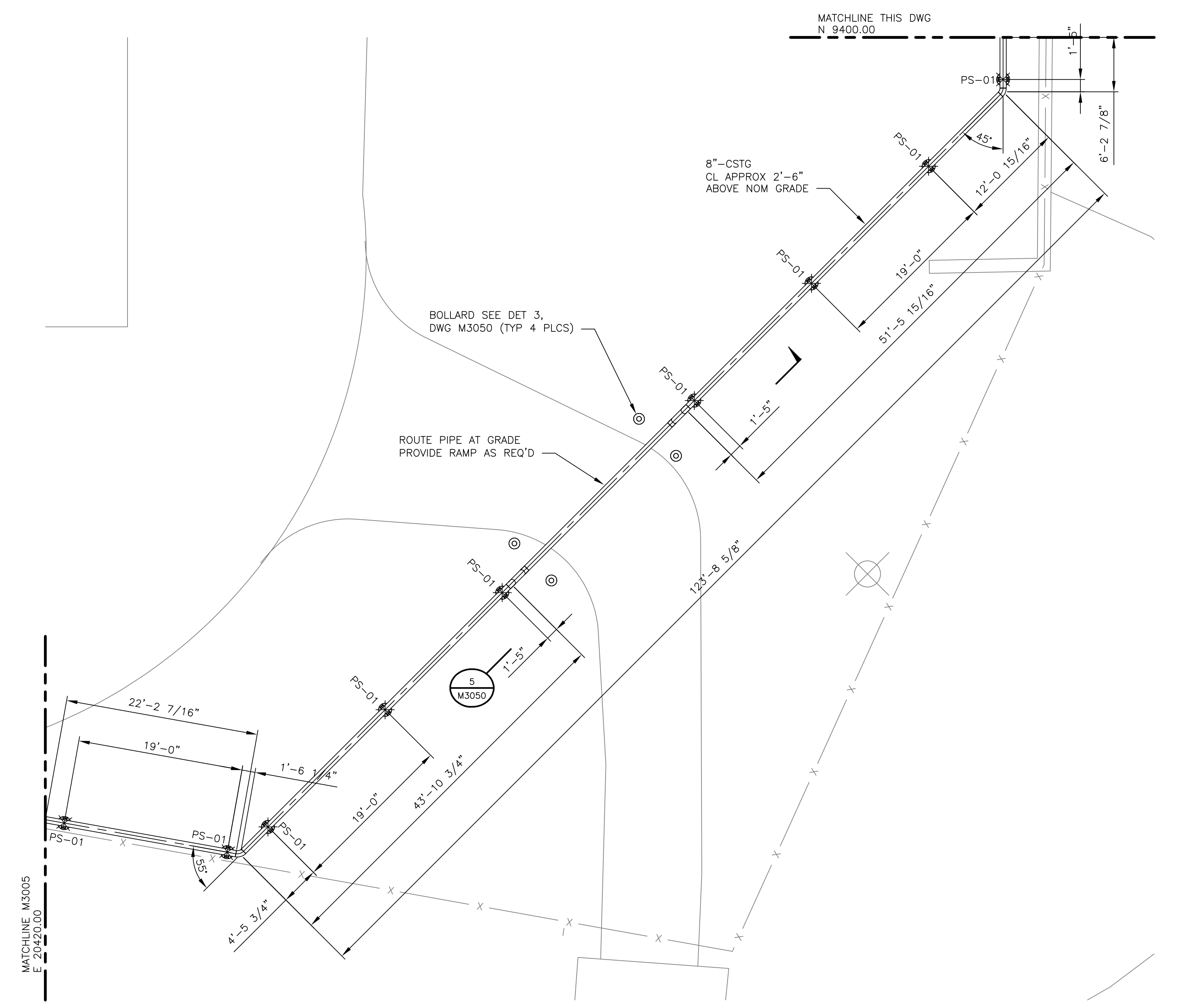
BLACK & VEATCH
 22740 Spur Bay Parkway, Suite 2100
 Jacksonville, Florida 32226
 ENGINEER: MBB DRAWN: DAS
 CHECKED: JAC DATE: 01/AUG/2018

PROJECT NUMBER: 197990-CSTG-M3003	DRAWING NUMBER: 0	REV 0
AREA:	REFERENCE DWG NUMBER:	

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PARTIAL PLAN

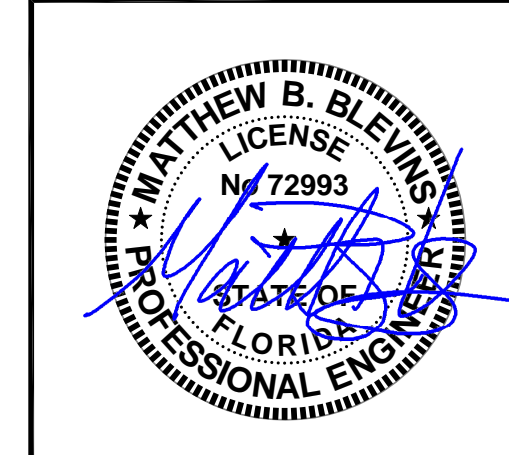


PARTIAL PLAN

NOTES

- 1. FOR GENERAL NOTES SEE DRAWING M3001.

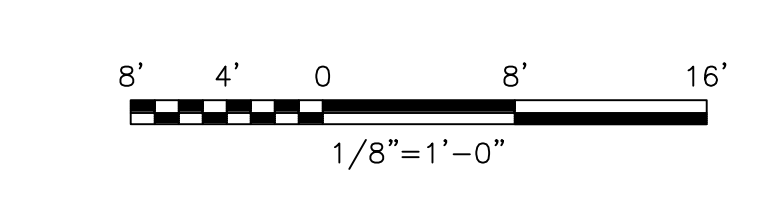
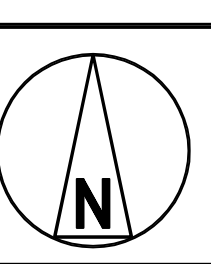
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NO	DATE	REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	PDE	APP
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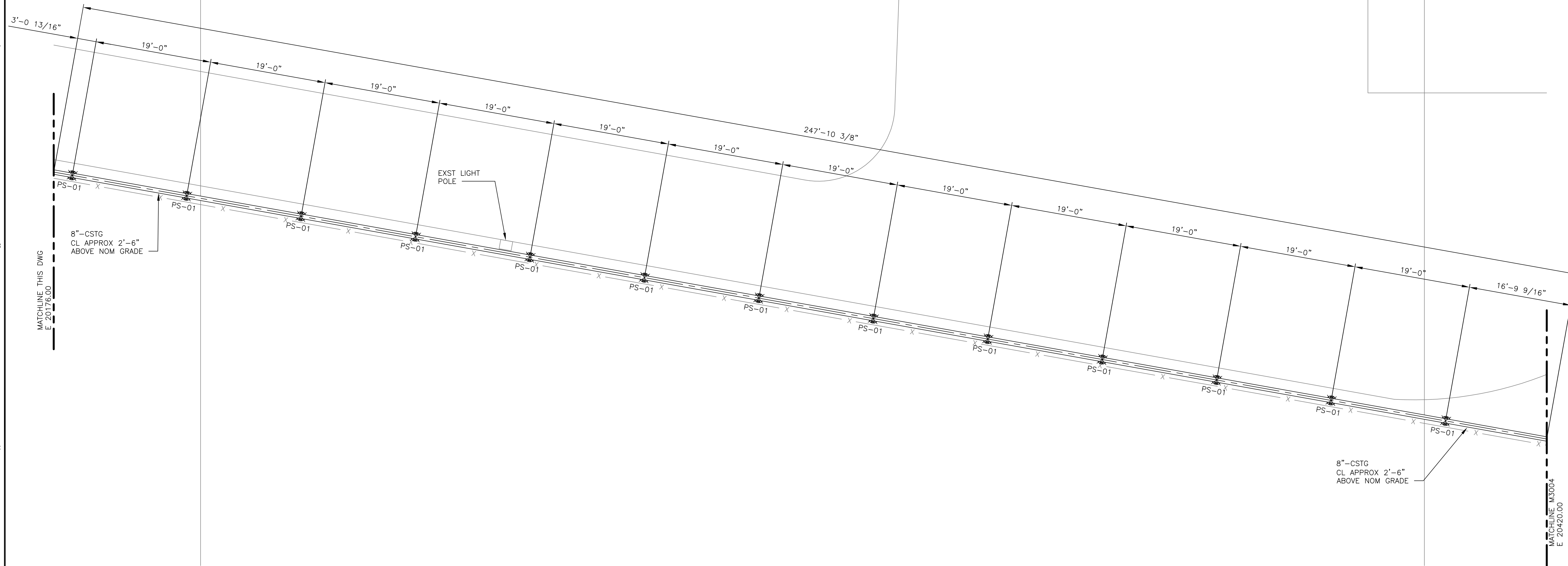


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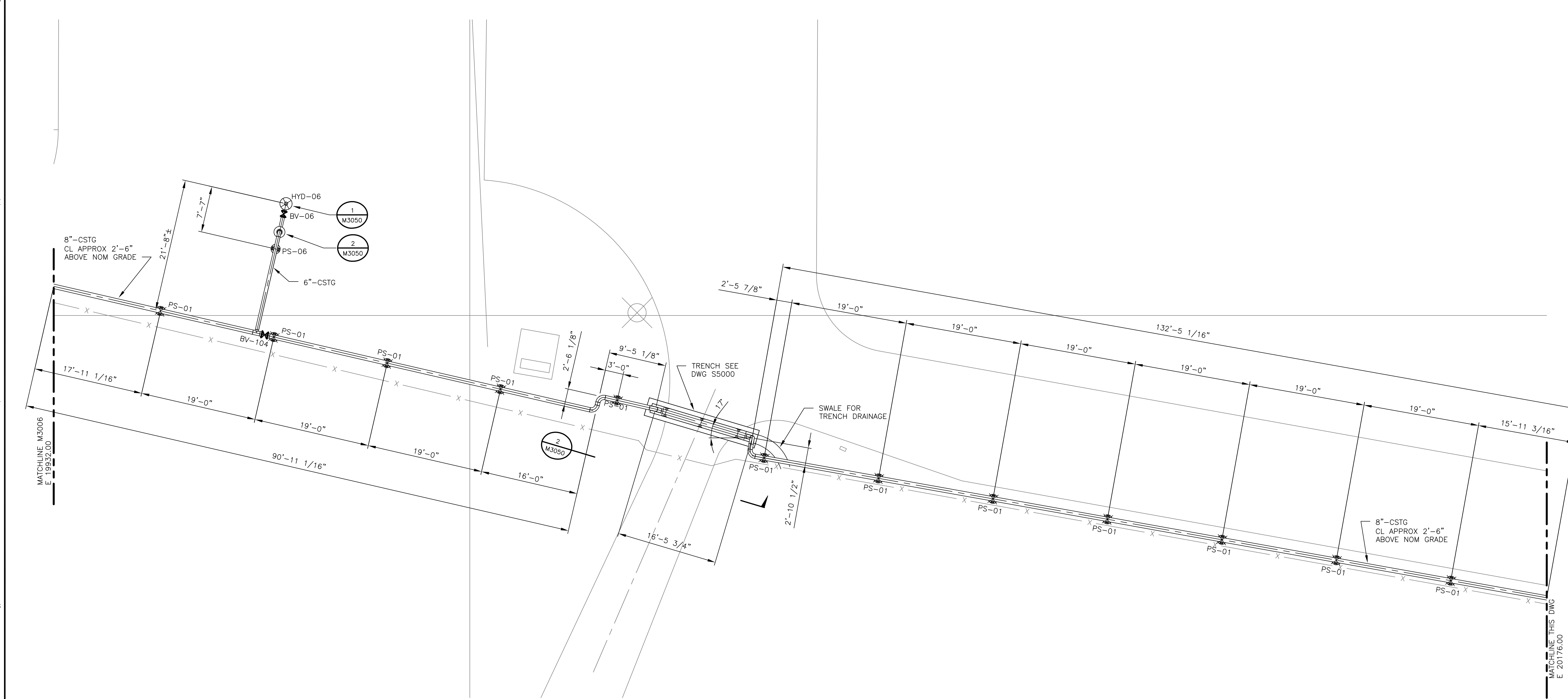
	2240 East Bay Parkway West Suite 2160 Jacksonville, Florida 32208 CERTIFICATE OF AUTHORIZATION No. 1532
ENGINEER: MBB	DRAWN: DAS
CHECKED: JAC	DATE: 01/AUG/2018

JEK
KENNEDY GENERATING STATION
FIRE PROTECTION LOOP REPLACEMENT
PIPING ARRANGEMENT

PROJECT NUMBER:	DRAWING NUMBER:	REV:
197990-CSTG-M3004	0	
AREA:	REFERENCE DWG NUMBER:	



PARTIAL PLAN



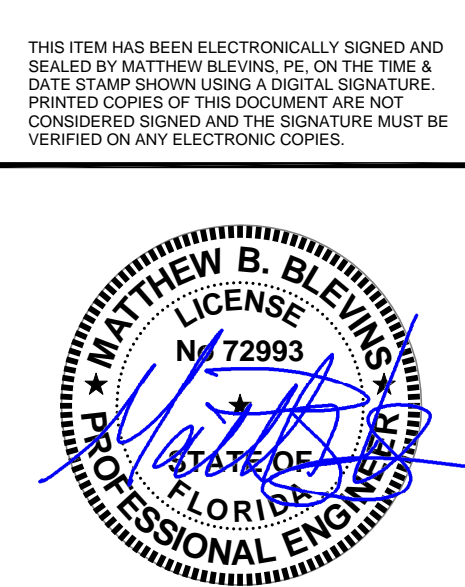
PARTIAL PLAN

NOTES

1. FOR GENERAL NOTES SEE DRAWING M3001.

APPROVED FOR CONSTRUCTION

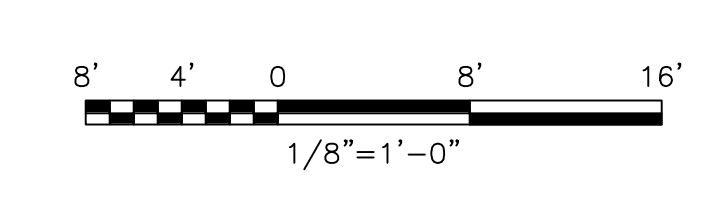
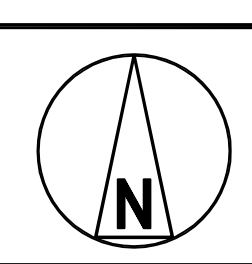
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1/8" = 1' = 1"

0	01/AUG/2018	APPROVED FOR CONSTRUCTION	DAS	DAS	JAC	MB	TPD
NO	DATE	REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	PDE	APP

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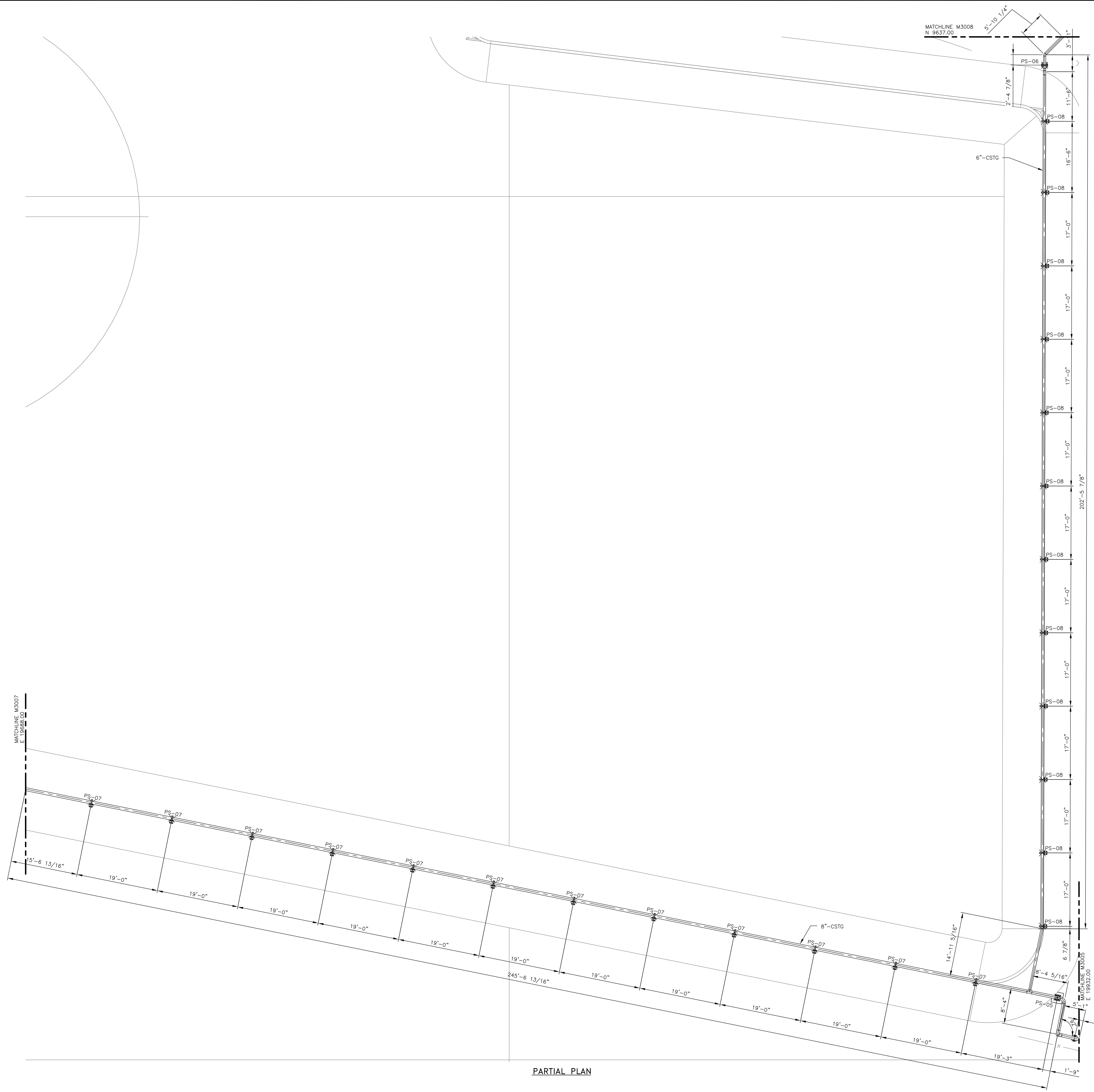


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BLACK & VEATCH	2240 East Bay Parkway West Suite 2140 Denver, CO 80238 CERTIFICATE OF AUTHORIZATION No. 1832
ENGINEER: MBB	DRAWN: DAS
CHECKED: JAC	DATE: 01/AUG/2018

JEA KENNEDY GENERATING STATION FIRE PROTECTION LOOP REPLACEMENT PIPING ARRANGEMENT		PROJECT NUMBER: 197990-CSTG-M3005	DRAWING NUMBER: 0
AREA:	REFERENCE DWG NUMBER:		

A
B
C
D
E
F
G



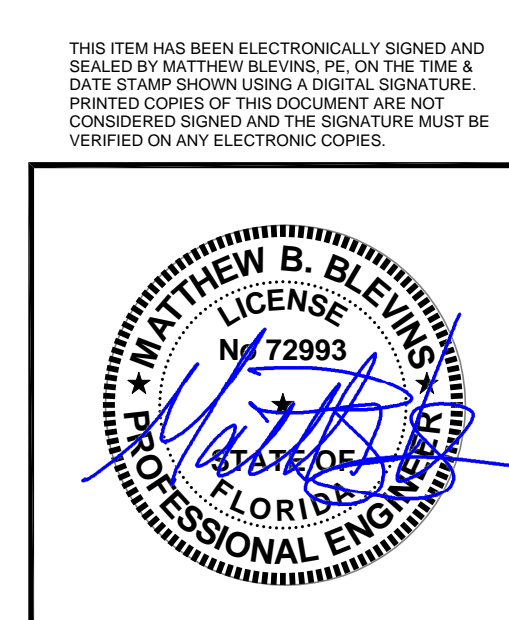
PARTIAL PLAN

NOTES

1. FOR GENERAL NOTES SEE DRAWING M3001.

APPROVED FOR CONSTRUCTION

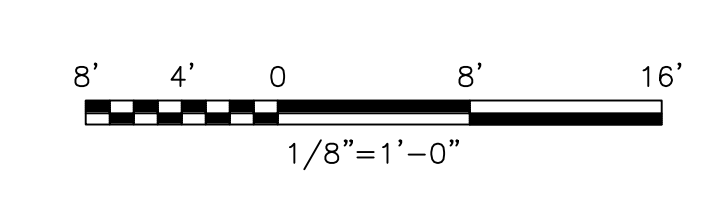
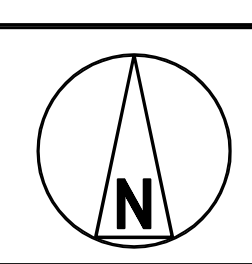
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NO	DATE	REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	PDE	APP
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01/AUG/2018	APPROVED FOR CONSTRUCTION	DAS	DAS	JAC	MBB	TPD	
NO	DATE	REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	PDE	APP

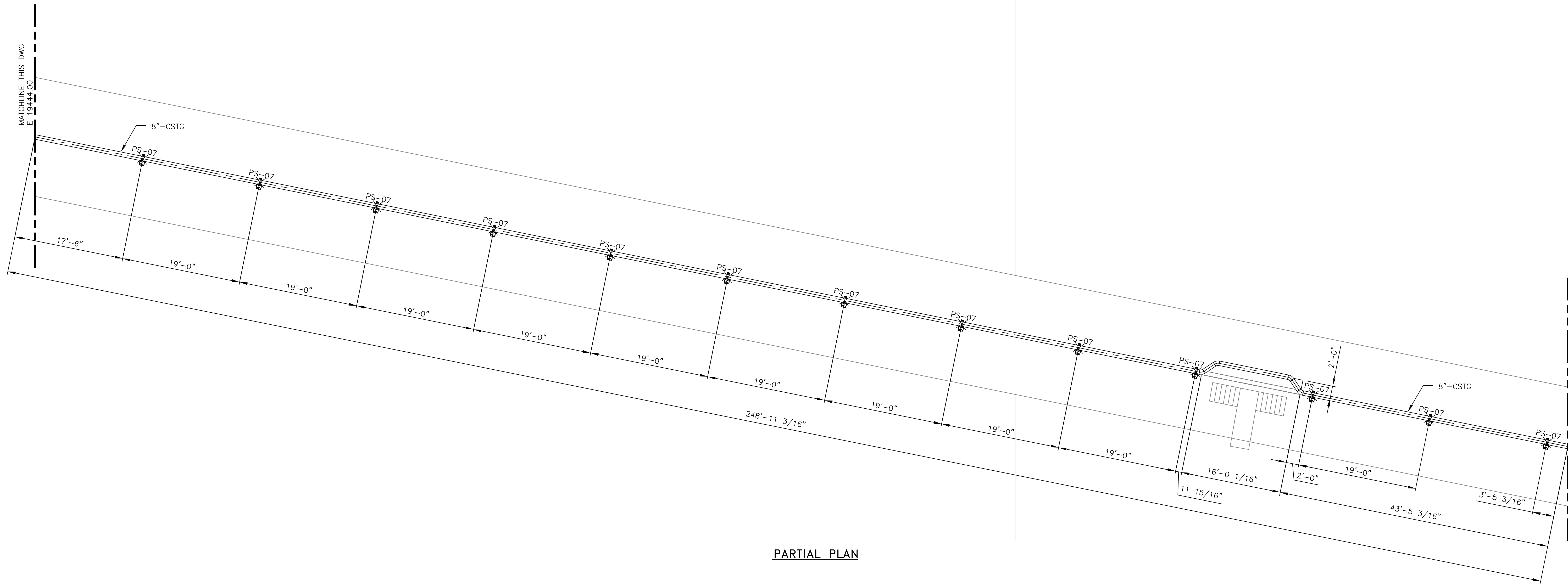


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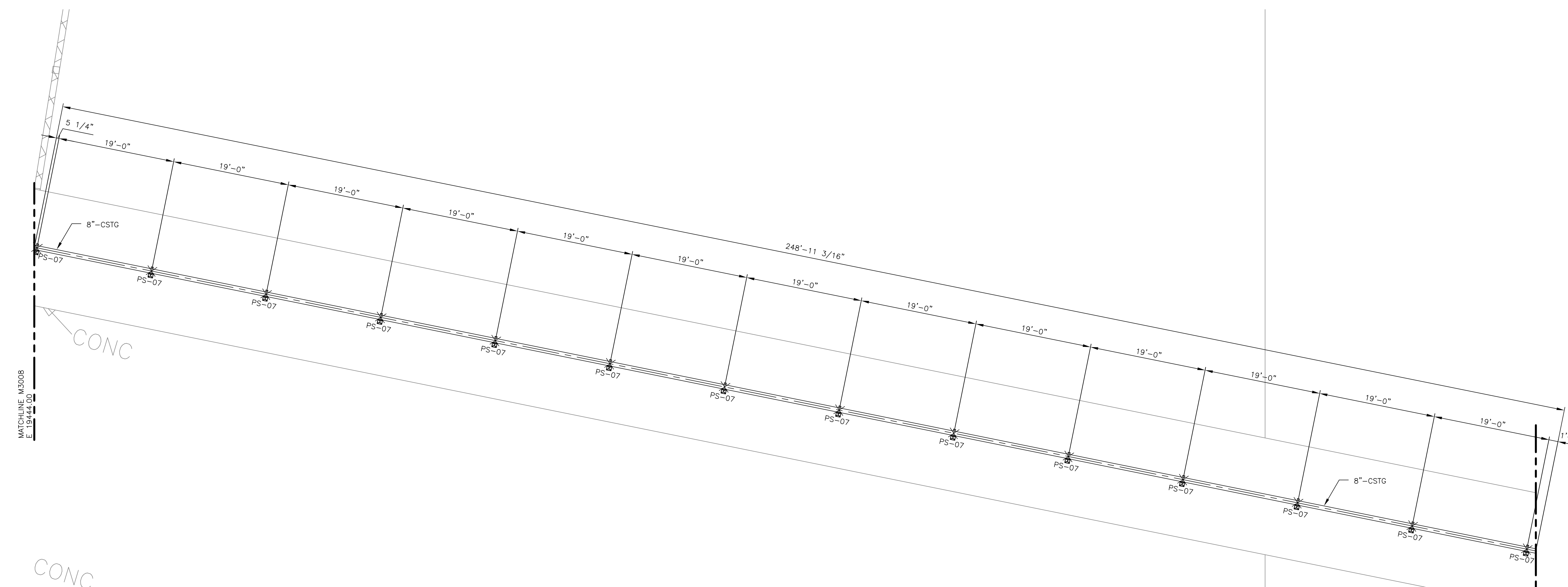
BLACK & VEATCH
2240, East Bay Parkway West, Suite 2100, Denver, CO 80231
 ENGINEER: MBB DRAWN: DAS
 CHECKED: JAC DATE: 01/AUG/2018

JEA KENNEDY GENERATING STATION FIRE PROTECTION LOOP REPLACEMENT PIPING ARRANGEMENT		PROJECT NUMBER: 197990-CSTG-M3006	DRAWING NUMBER: 0	REV 0
ENGINEER: MBB CHECKED: JAC	DRAWN: DAS DATE: 01/AUG/2018	CODE:	REFERENCE DWG NUMBER:	AREA:

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PARTIAL PLAN



PARTIAL PLAN

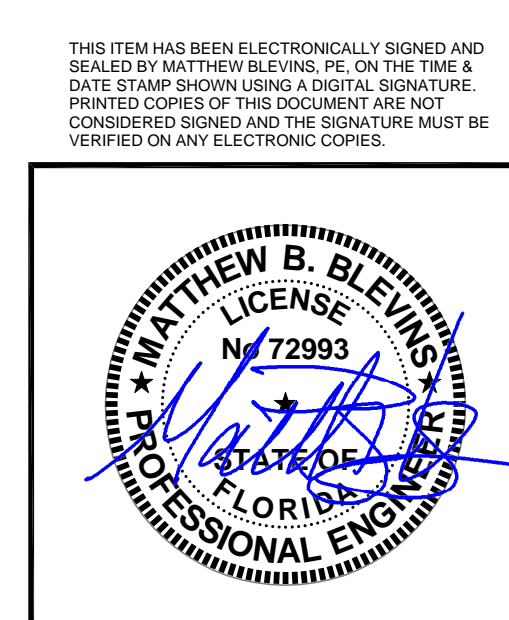
NOTES

1. FOR GENERAL NOTES SEE DRAWING M3001.

APPROVED FOR CONSTRUCTION

JEA
KENNEDY GENERATING STATION

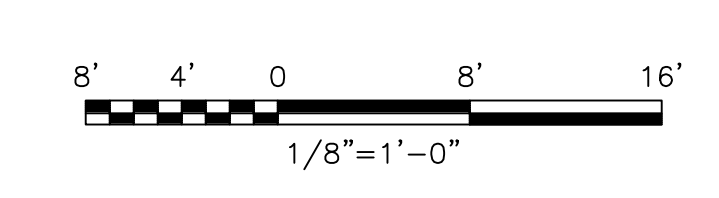
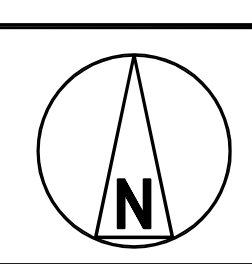
FIRE PROTECTION LOOP REPLACEMENT
PIPING ARRANGEMENT



SYN2704
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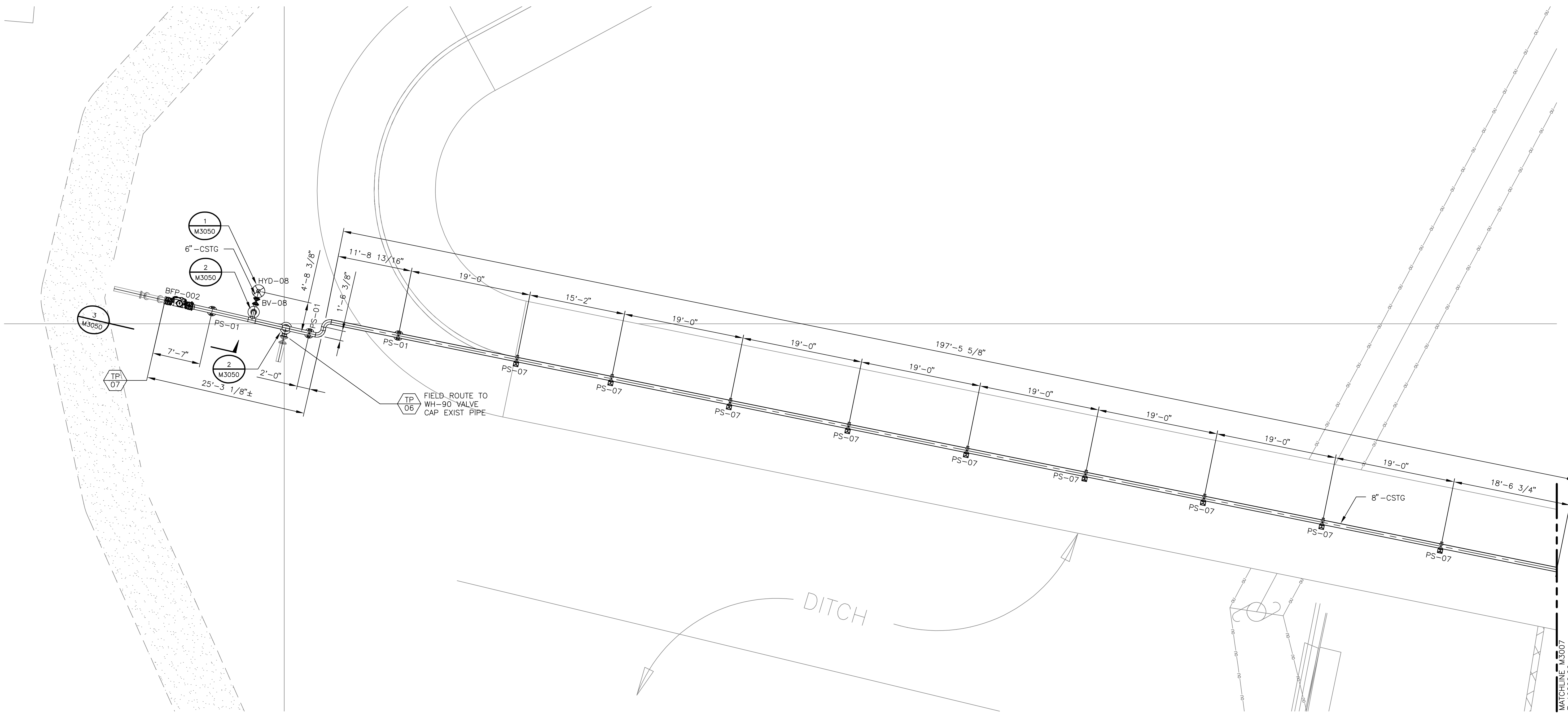
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NO	DATE	REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	PDE	APP



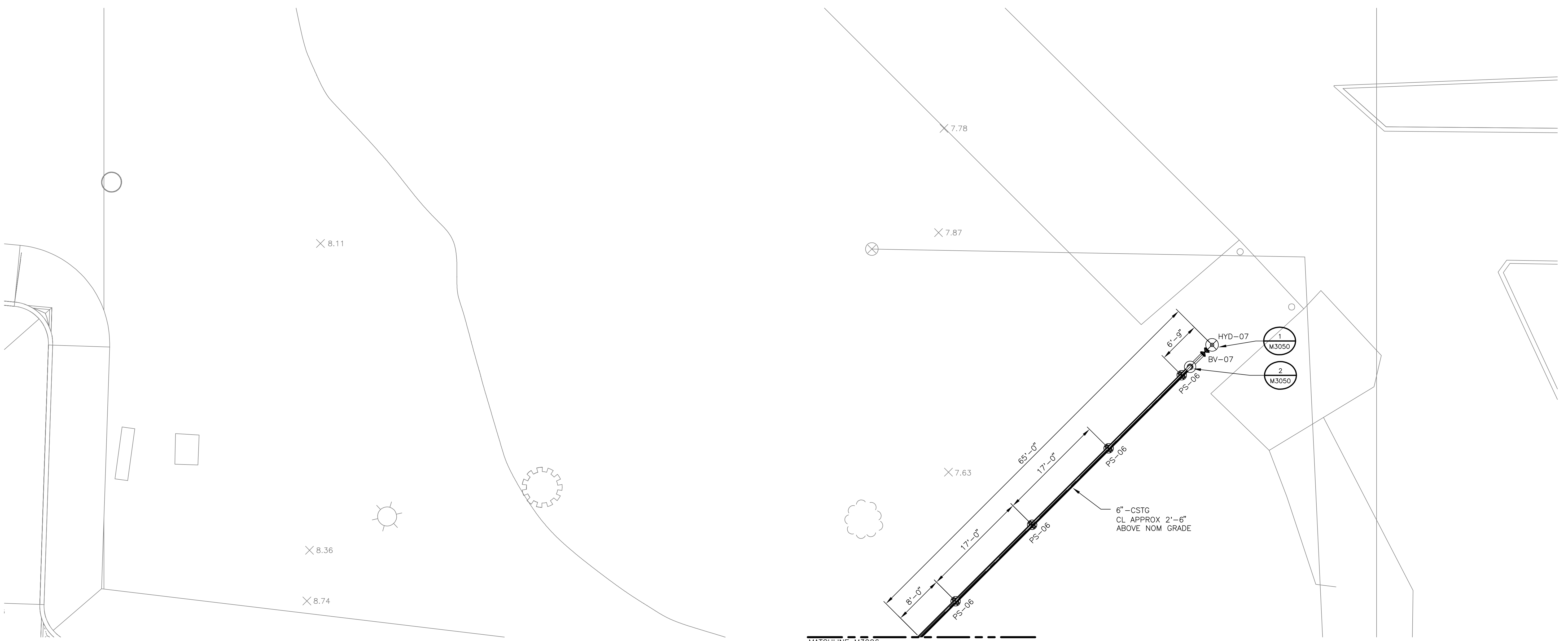
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BLACK & VEATCH	2240 Capital City Parkway, Suite 2000 Baltimore, Maryland 21208 Telephone: 410.528.2000 Fax: 410.528.2001
ENGINEER: MBB	DRAWN: DAS
CHECKED: JAC	DATE: 01/AUG/2018

PROJECT NUMBER: 197990-CSTG-M3007	DRAWING NUMBER: 0
AREA:	REFERENCE DWG NUMBER:



PARTIAL PLAN

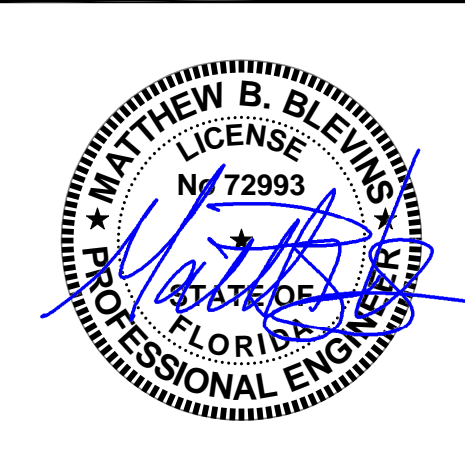


PARTIAL PLAN

NOTES

1. FOR GENERAL NOTES SEE DRAWING M3001.

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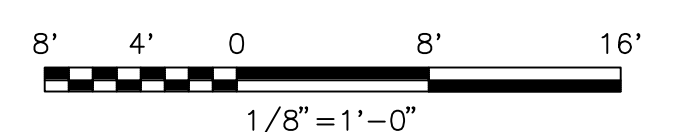
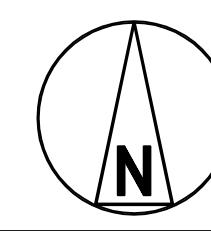
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JEA KENNEDY GENERATING STATION		PROJECT NUMBER: 197990-CSTG-M3008	DRAWING NUMBER: 0
FIRE PROTECTION LOOP REPLACEMENT PIPING ARRANGEMENT		CODE:	REFERENCE DWG NUMBER:
ENGINEER: MBB	DRAWN: DAS	CHECKED: JAC	DATE: 01/AUG/2018

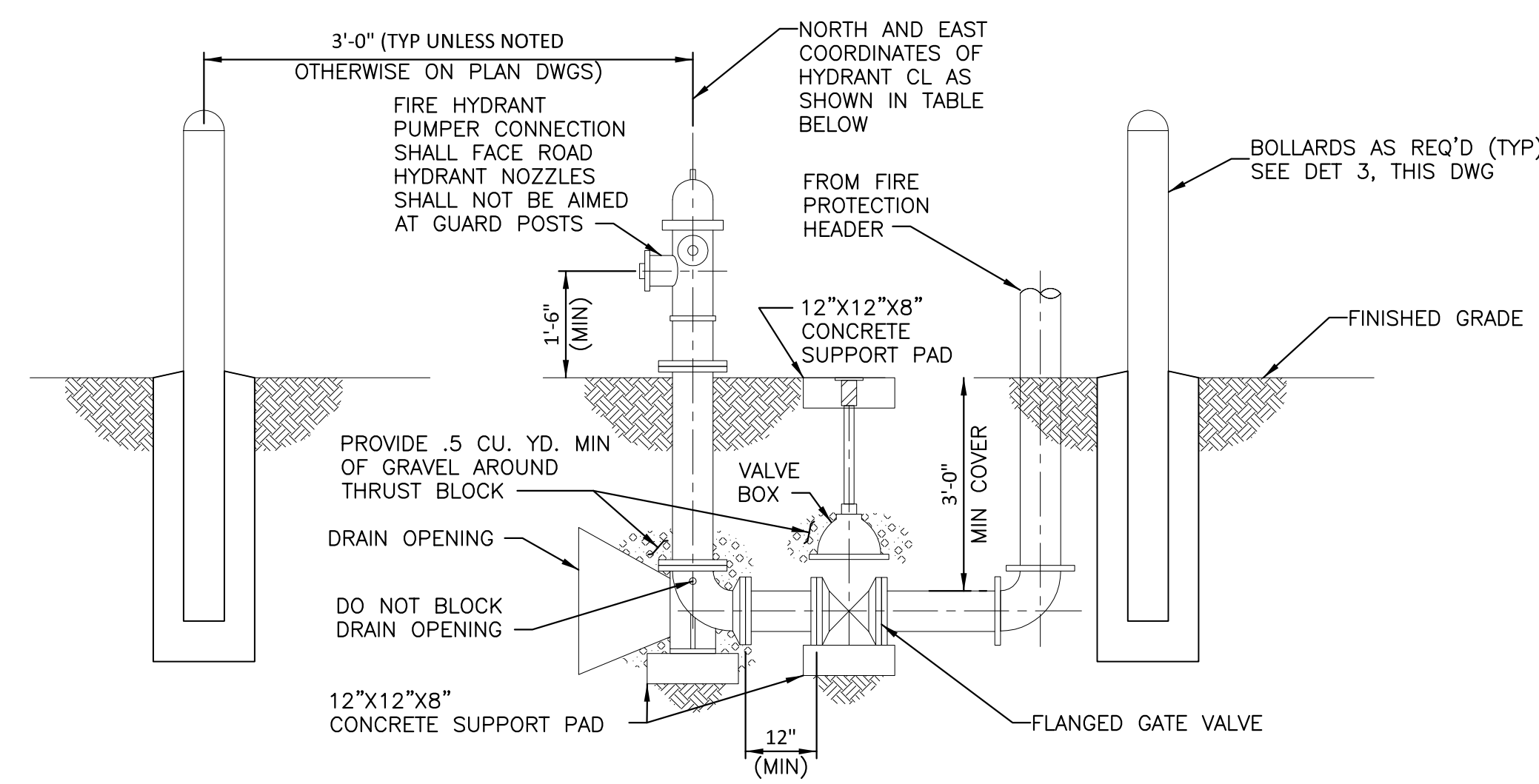
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ASCD
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0	01/AUG/2018	APPROVED FOR CONSTRUCTION	DAS	DAS	JAC	MBB	TPD
NO	DATE	REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	PDE	APP



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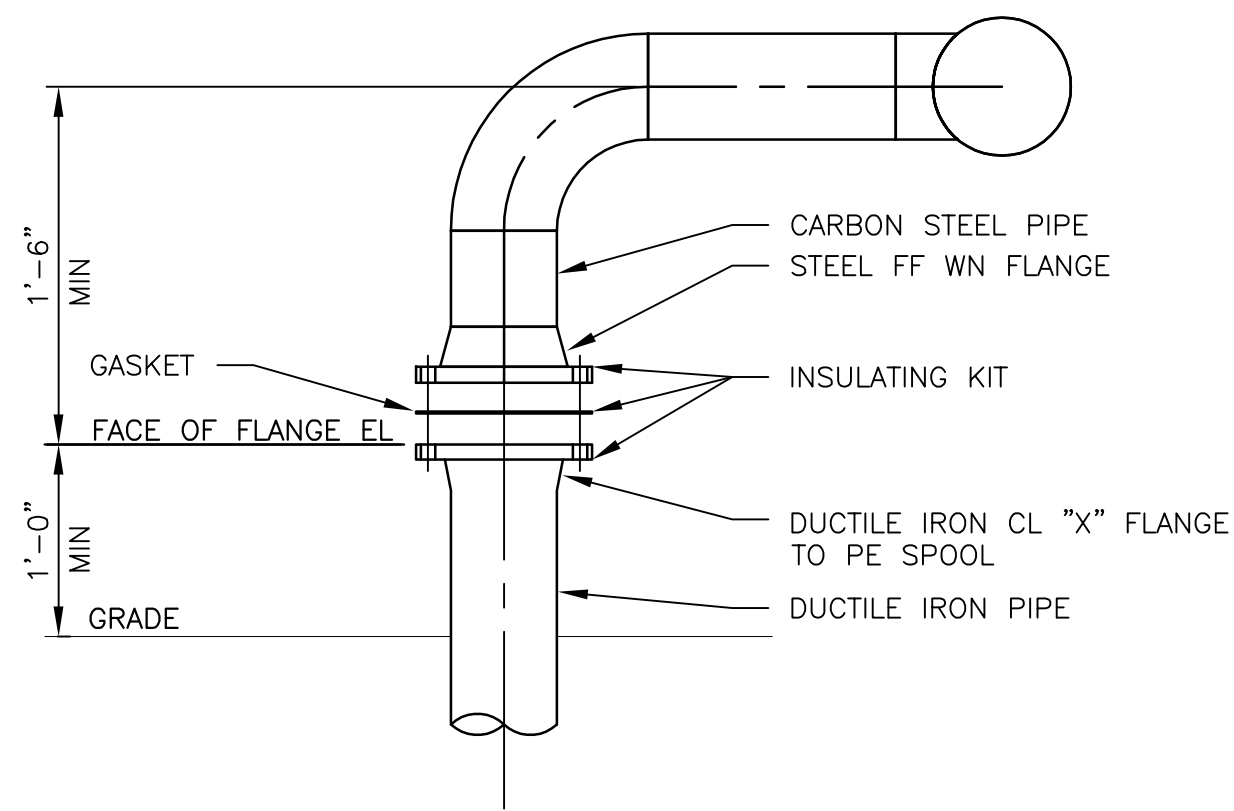
BLACK & VEATCH
2240 East Bay Parkway West
Suite 2140
Tomball, Texas 77375
CERTIFICATE OF AUTHORIZATION
No. 1512



FIRE HYDRANT AND VALVE TABLE				
HYDRANT / VALVE NO.	DRAWING NO.	CENTERLINE COORDINATES	GRADE EL	
		NORTH	EAST	
CSTG-HYD-01/CSTG-BV-01	M3001	N 10029.00	E 19272.91	14.0±
CSTG-HYD-02/CSTG-BV-02	M3001	N 10033.95	E 19517.53	13.0±
CSTG-HYD-03/CSTG-BV-03	M3003	N 9890.97	E 20417.74	8.0±
CSTG-HYD-04/CSTG-BV-04	M3003	N 9763.25	E 20463.00	8.0±
CSTG-HYD-05/CSTG-BV-05	M3004	N 9446.83	E 20478.40	7.0±
CSTG-HYD-06/CSTG-BV-06	M3005	N 9418.25	E 19969.97	7.0±
CSTG-HYD-07/CSTG-BV-07	M3008	N 9682.96	E 19974.14	8.0±
CSTG-HYD-08/CSTG-BV-08	M3008	N 9608.95	E 18996.00	15.0±

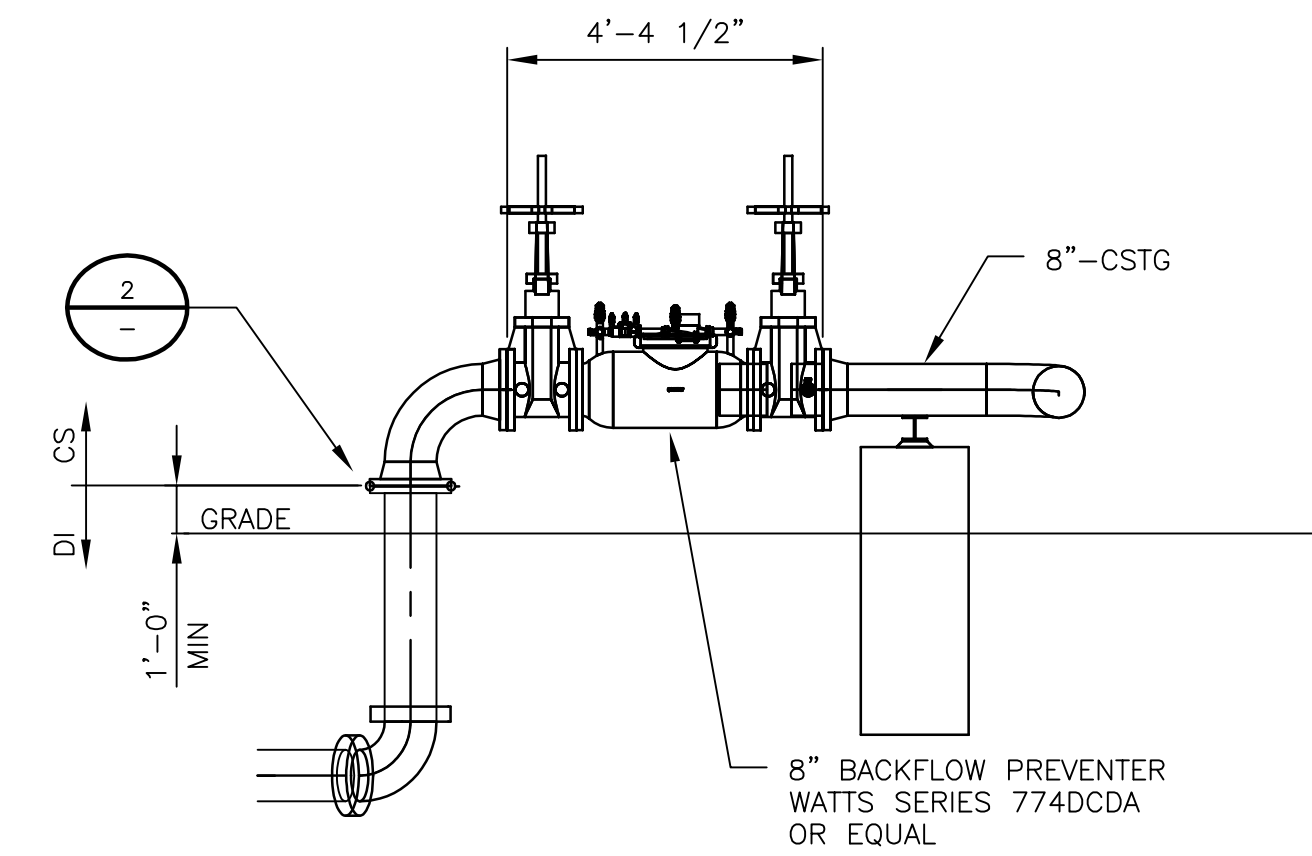
NOTE: COORDINATES AND ELEVATIONS ARE APPROXIMATE (FIELD VERIFY)

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

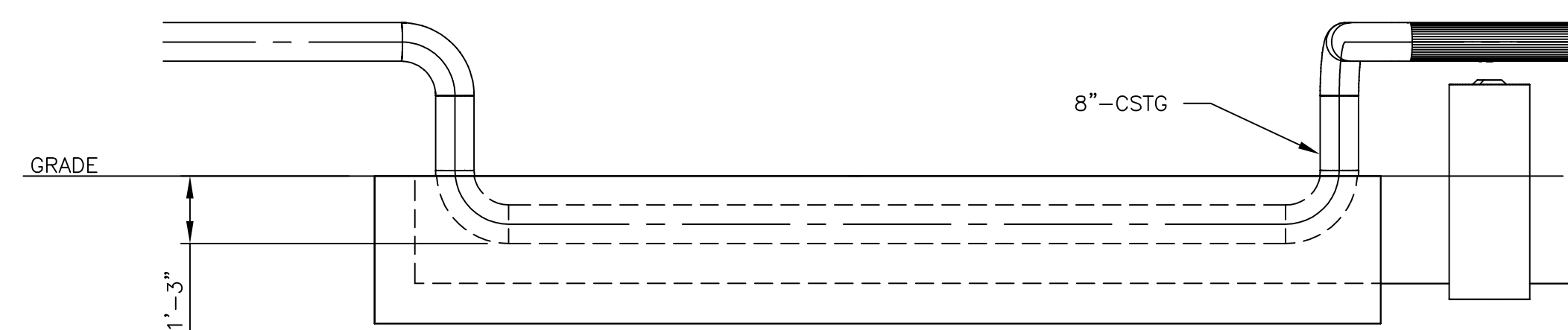


DUCTILE IRON FLANGED SPOOL TO STEEL FLANGE

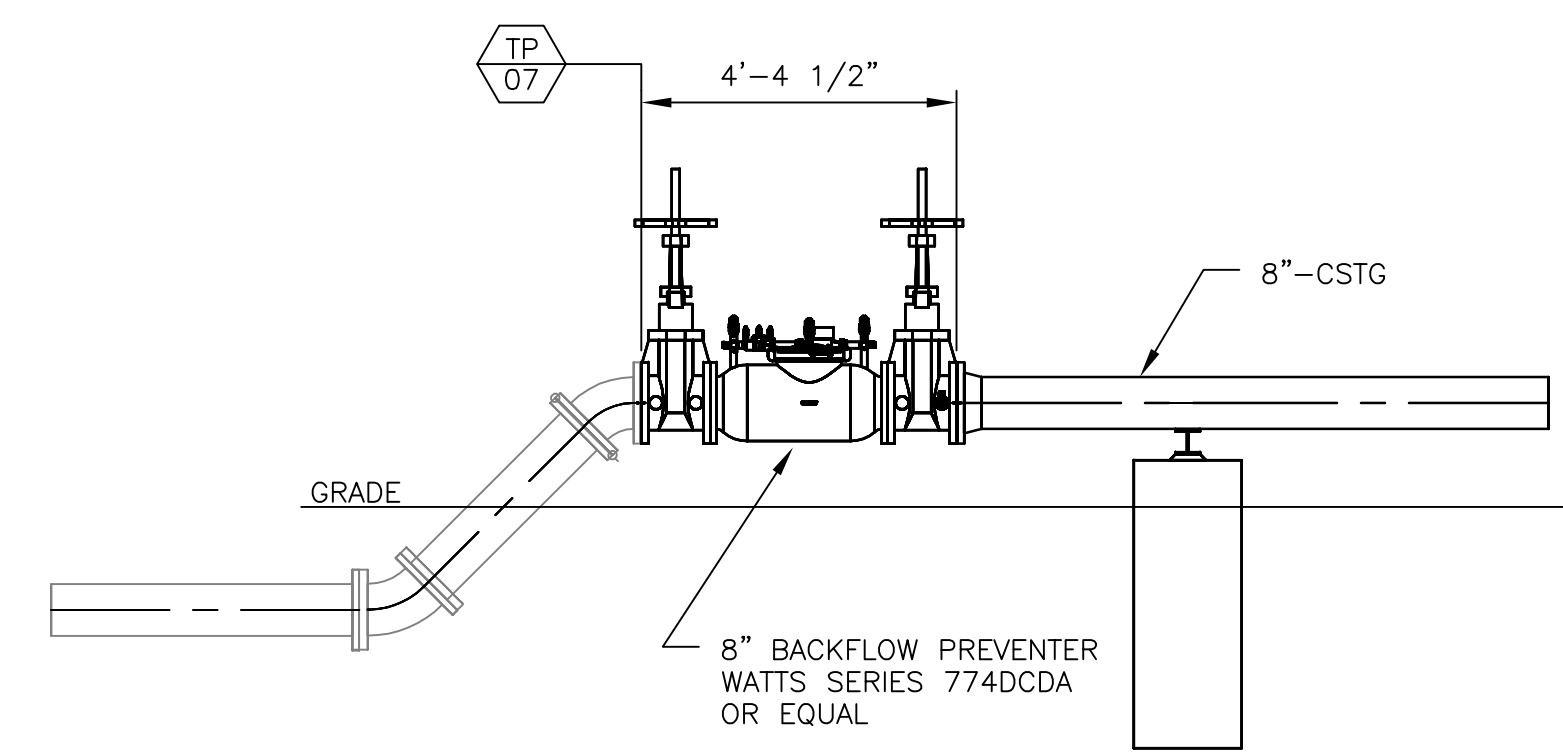
DETAIL 2-TERMINATION POINT
SCALE: NONE



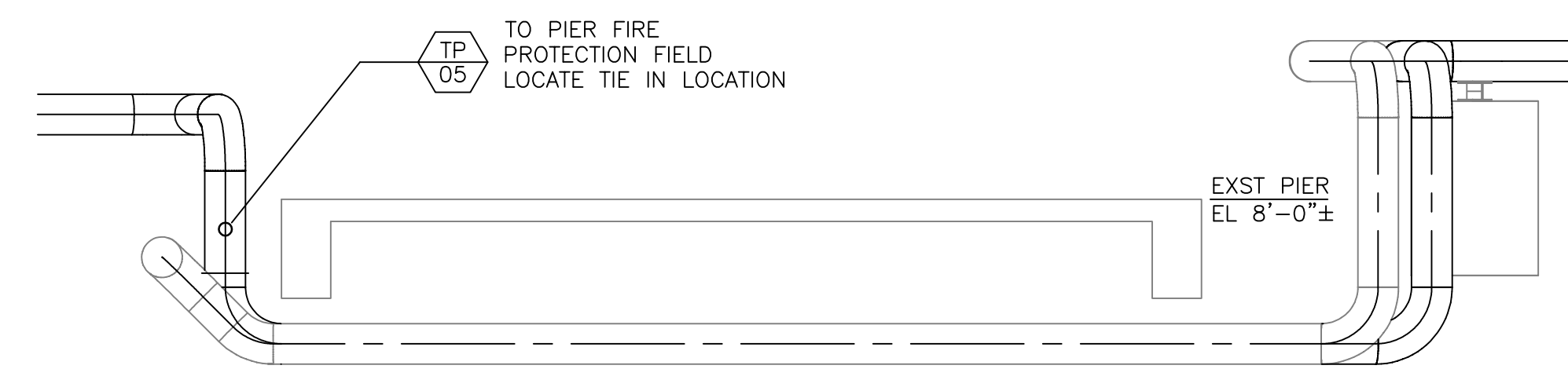
SECTION 1
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M3001



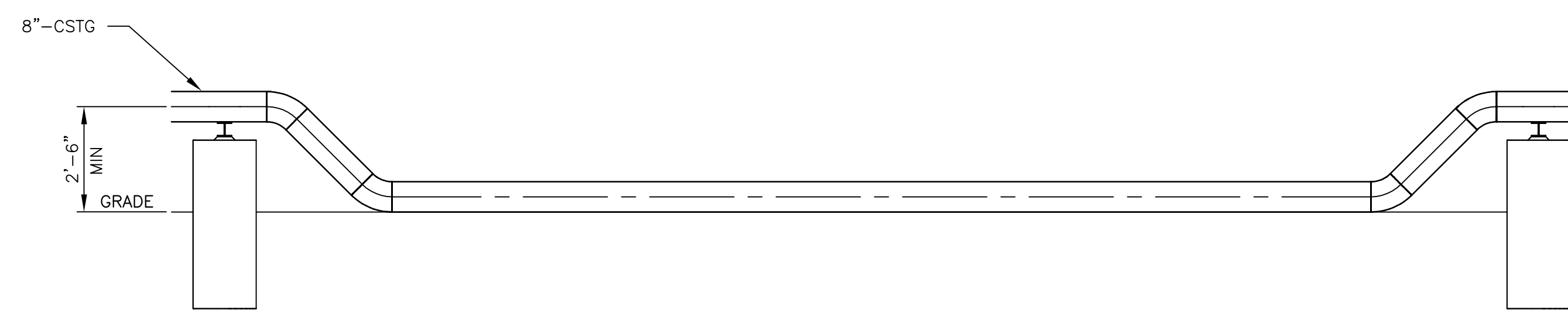
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SCALE: 3/8" = 1'-0"
M3005



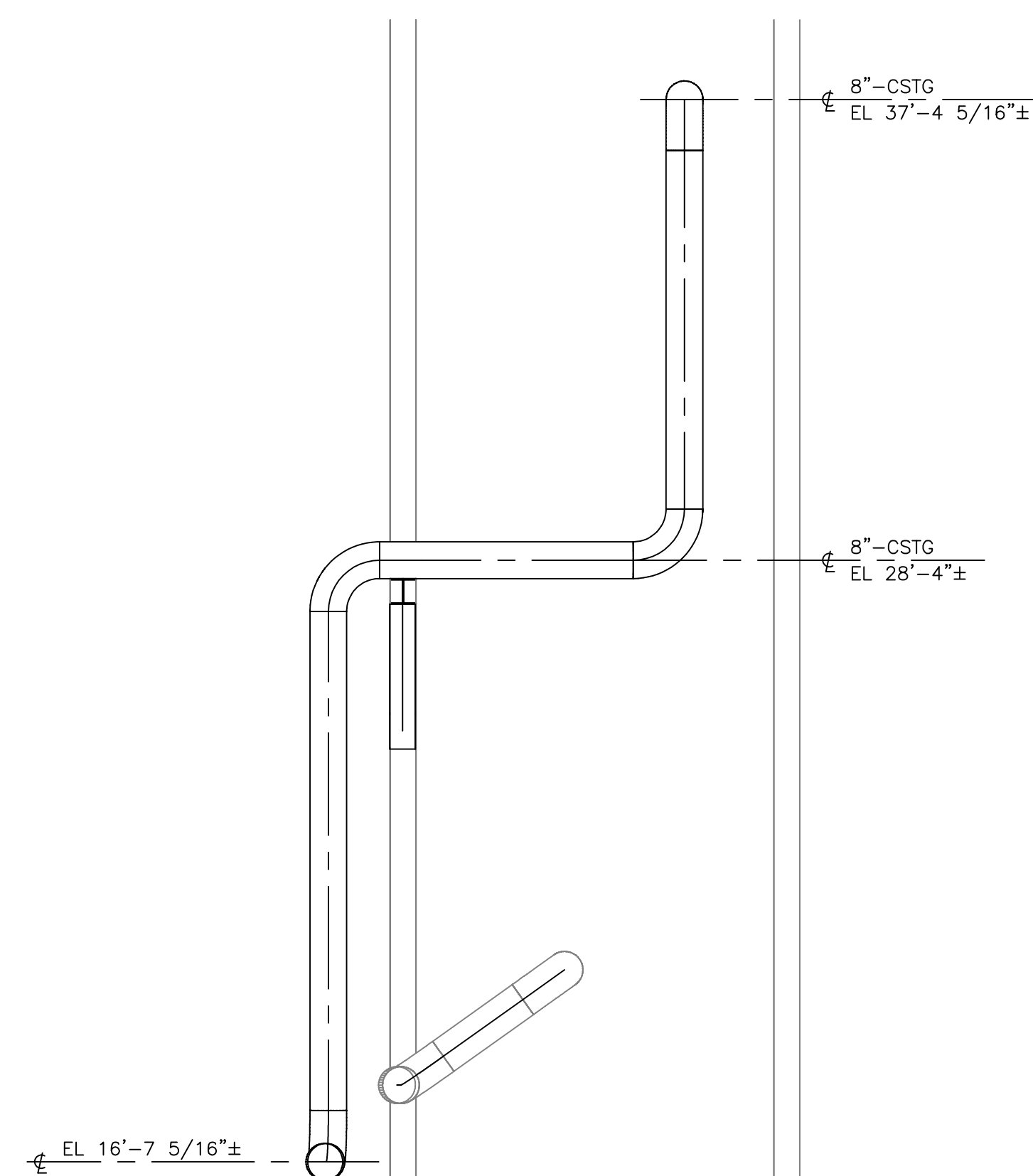
SECTION 3
SCALE: 3/8" = 1'-0"
M3008



SECTION 4
SCALE: 3/8" = 1'-0"
M3003

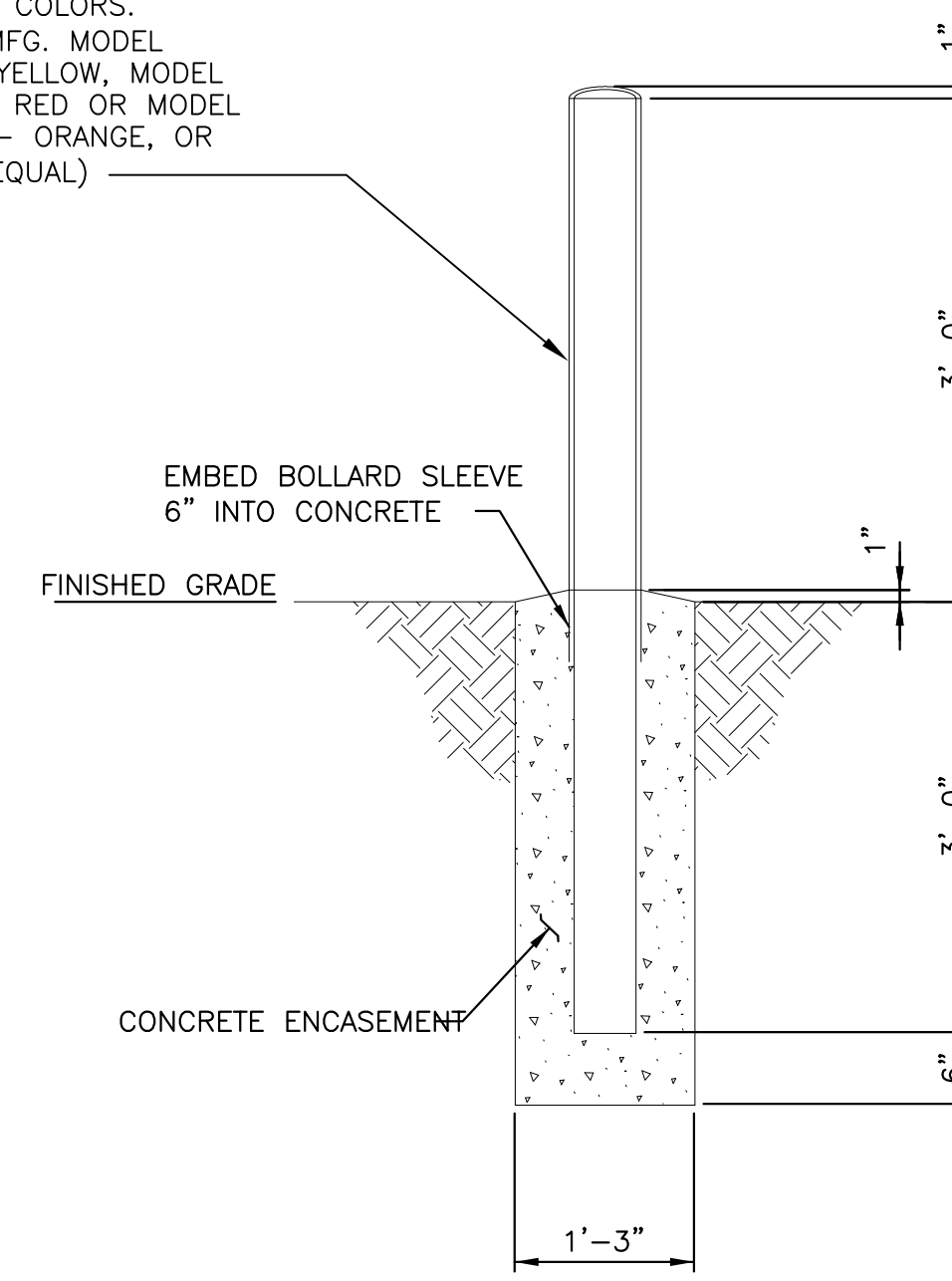


SECTION 5
SCALE: 3/8" = 1'-0"
M3004



SECTION 6
SCALE: 3/8" = 1'-0"
M3002

6" PRIME PAINTED STEEL PIPE FILLED WITH 2000 PSI MINIMUM DESIGN STRENGTH CONCRETE WITH 6"X56" POLYETHYLENE POST SLEEVE. COLOR TO MATCH PLANT SAFETY COLORS. (USE EAGLE MFG. MODEL NO. 1730 - YELLOW, MODEL NO. 1730R - RED OR MODEL NO. 1730OR - ORANGE, OR ACCEPTABLE EQUAL)

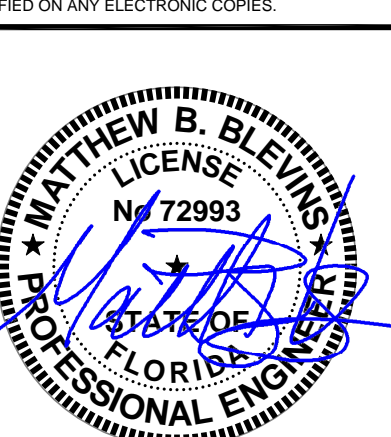


DETAIL 3
SCALE: NONE

NOTES

1. FOR GENERAL NOTES SEE DRAWING M3001.

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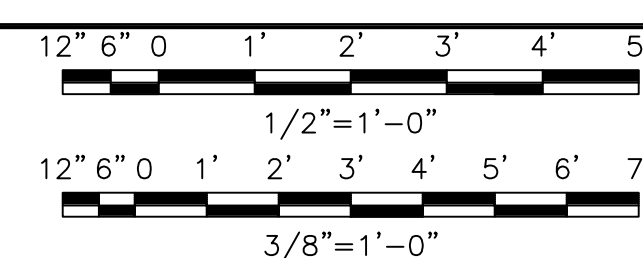
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JEA
KENNEDY GENERATING STATION
FIRE PROTECTION LOOP REPLACEMENT
PIPING SECTIONS AND DETAILS

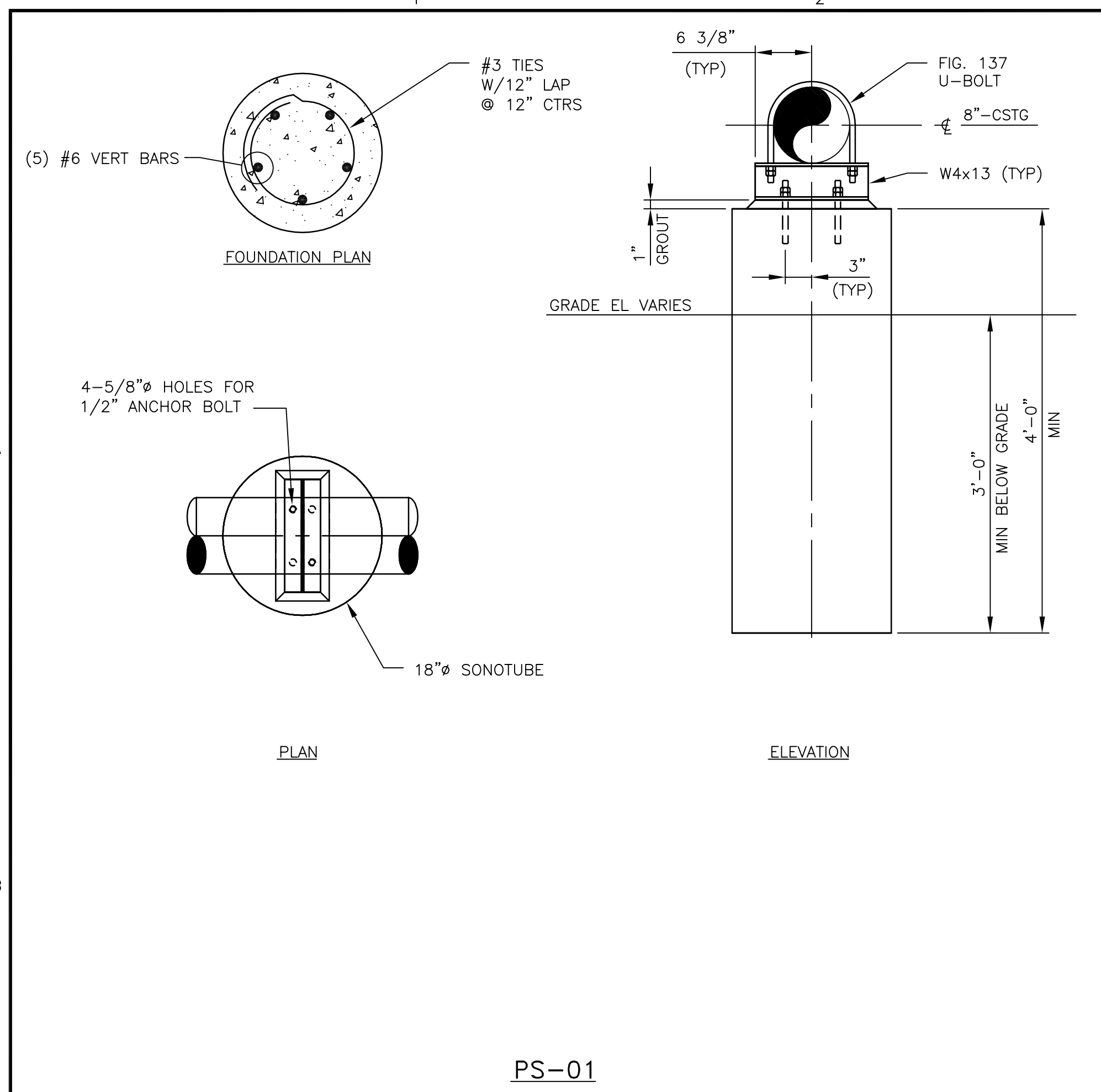
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DRAWING NUMBER: 0
CODE: REFERENCE DWG NUMBER:
AREA:

BLACK & VEATCH
ENGINEER: MBB
CHECKED: JAC
DATE: 01/AUG/2018

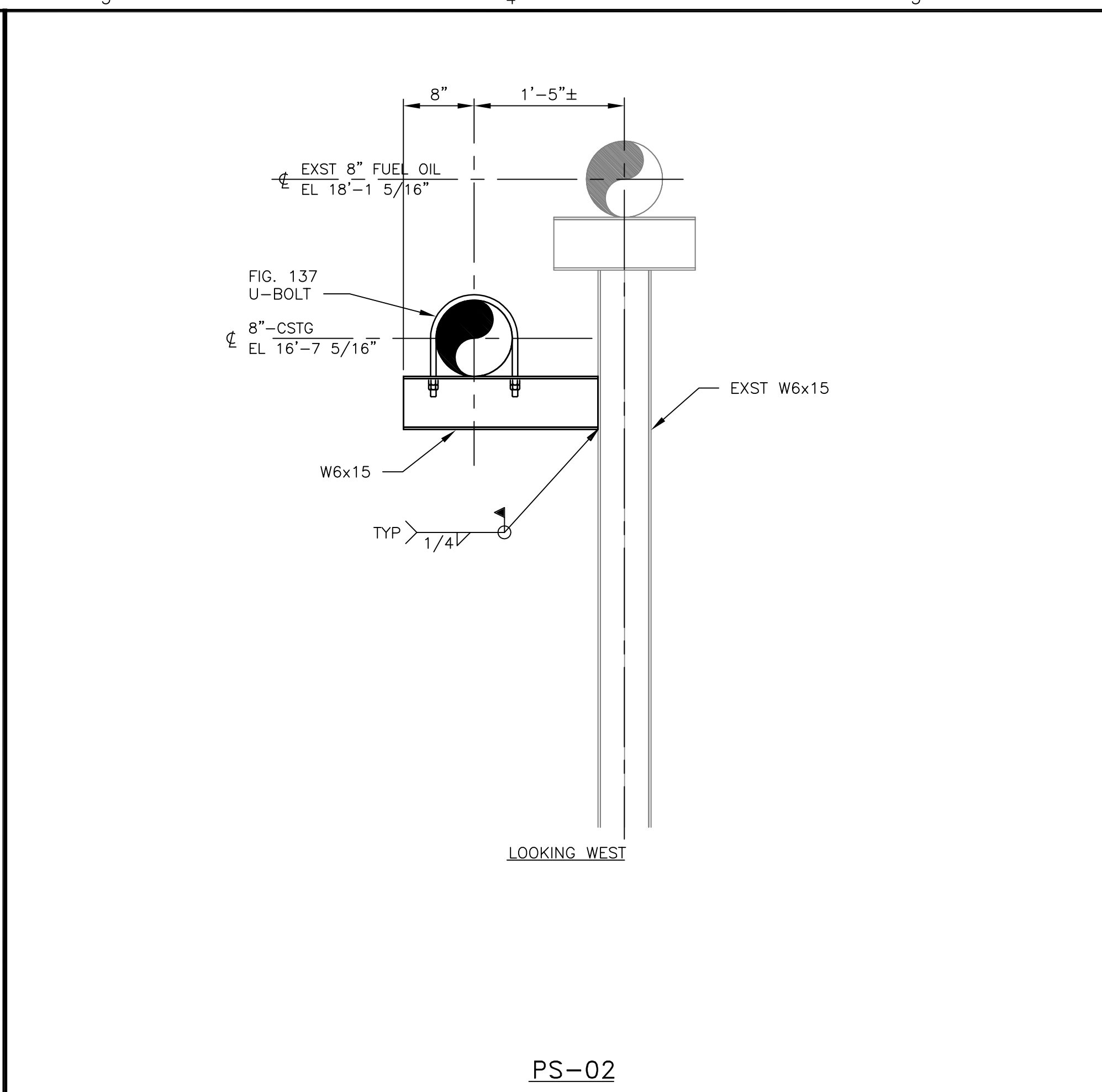
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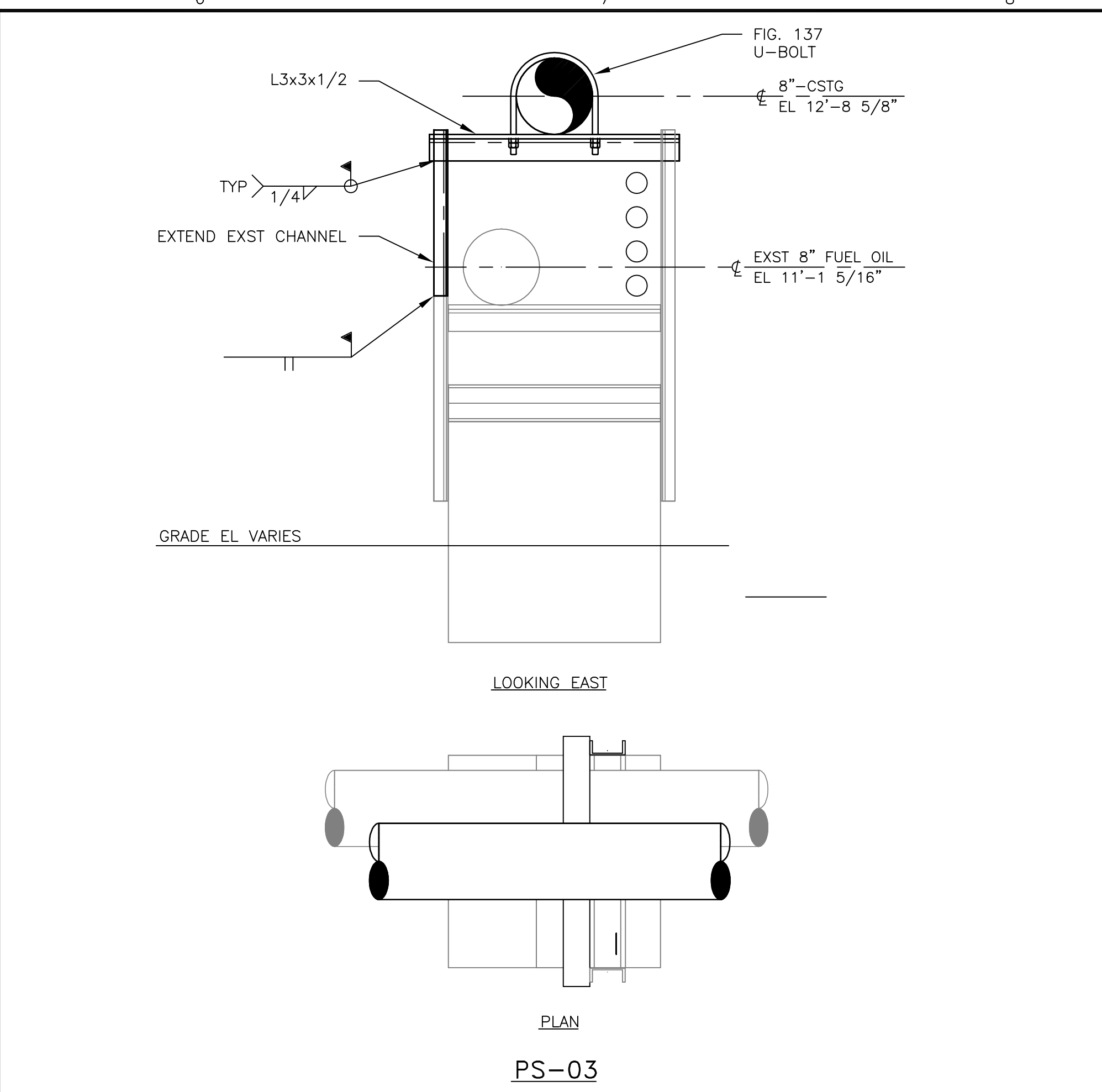
NO	DATE	REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	PDE	APP
0	01/AUG/2018	APPROVED FOR CONSTRUCTION	DAS	DAS	JAC	MBB	TPD



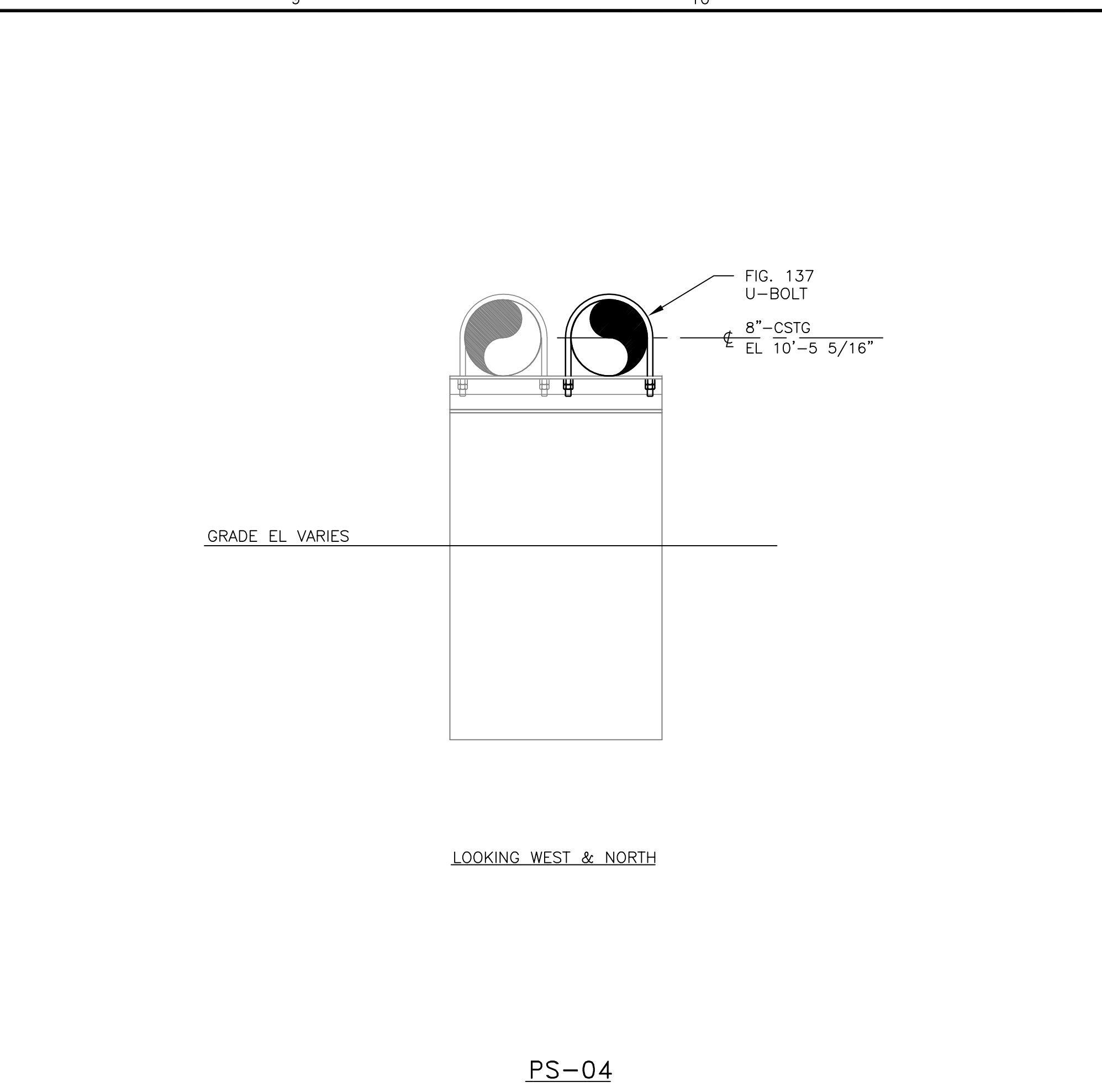
PS-01



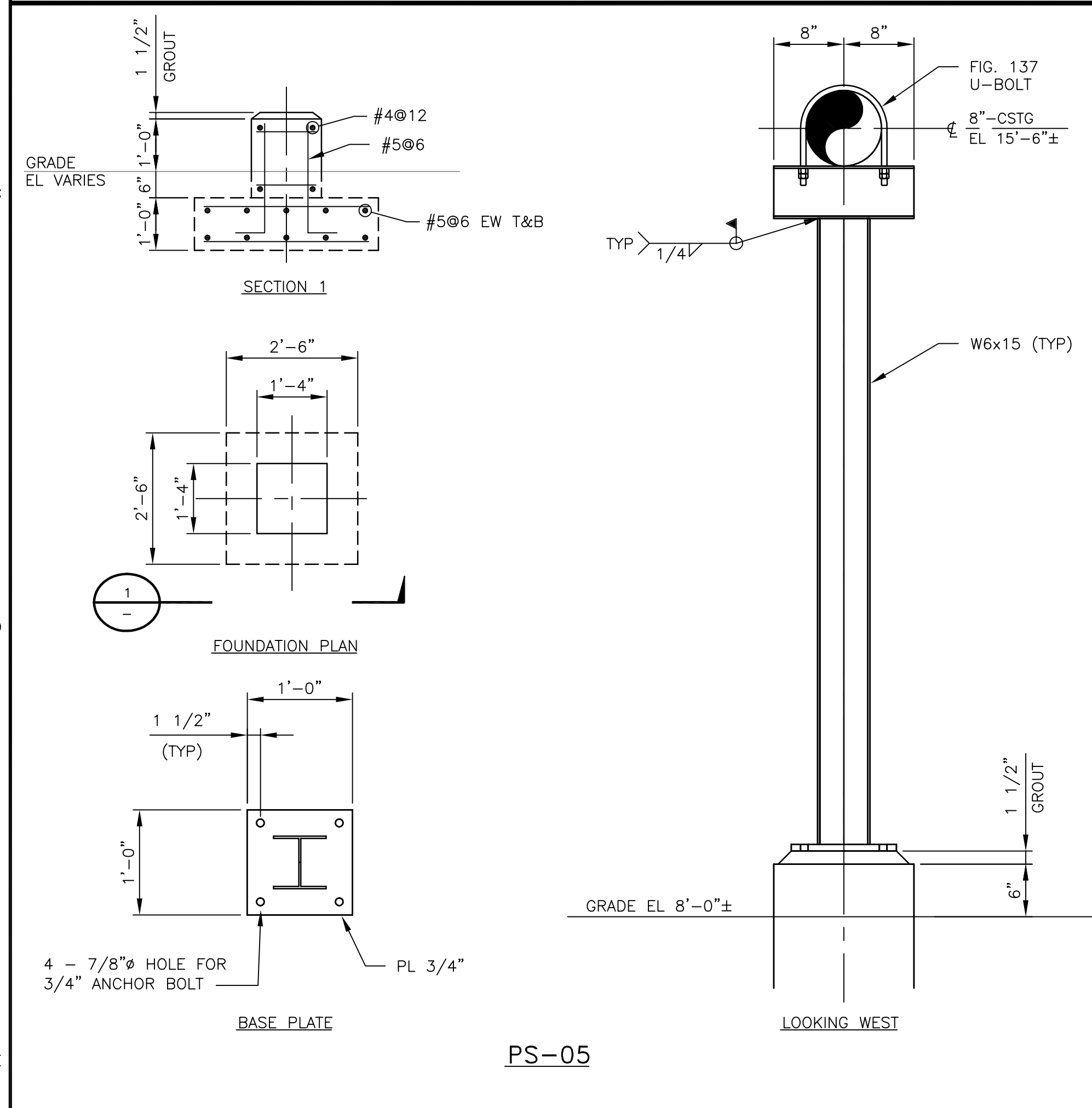
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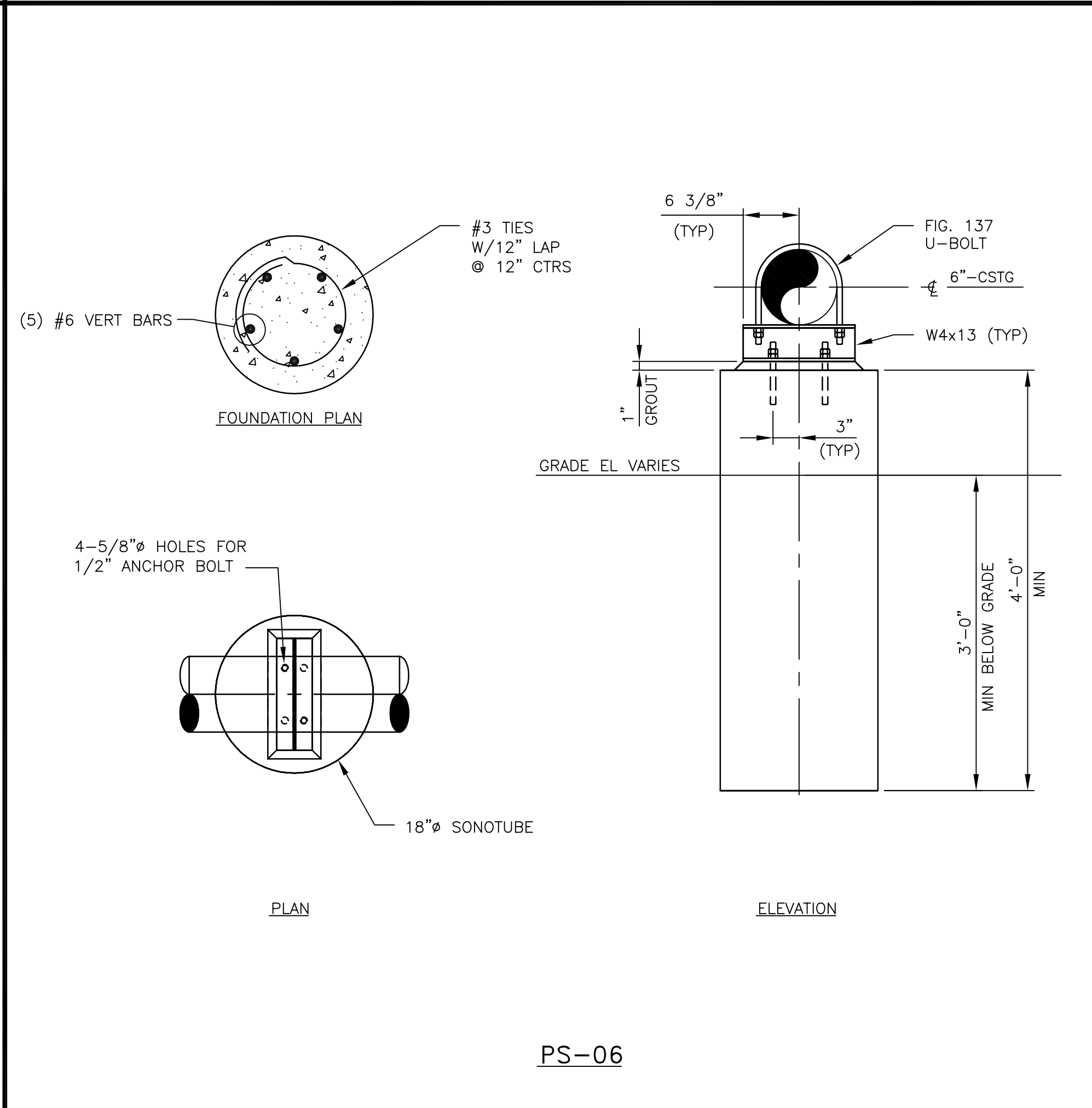
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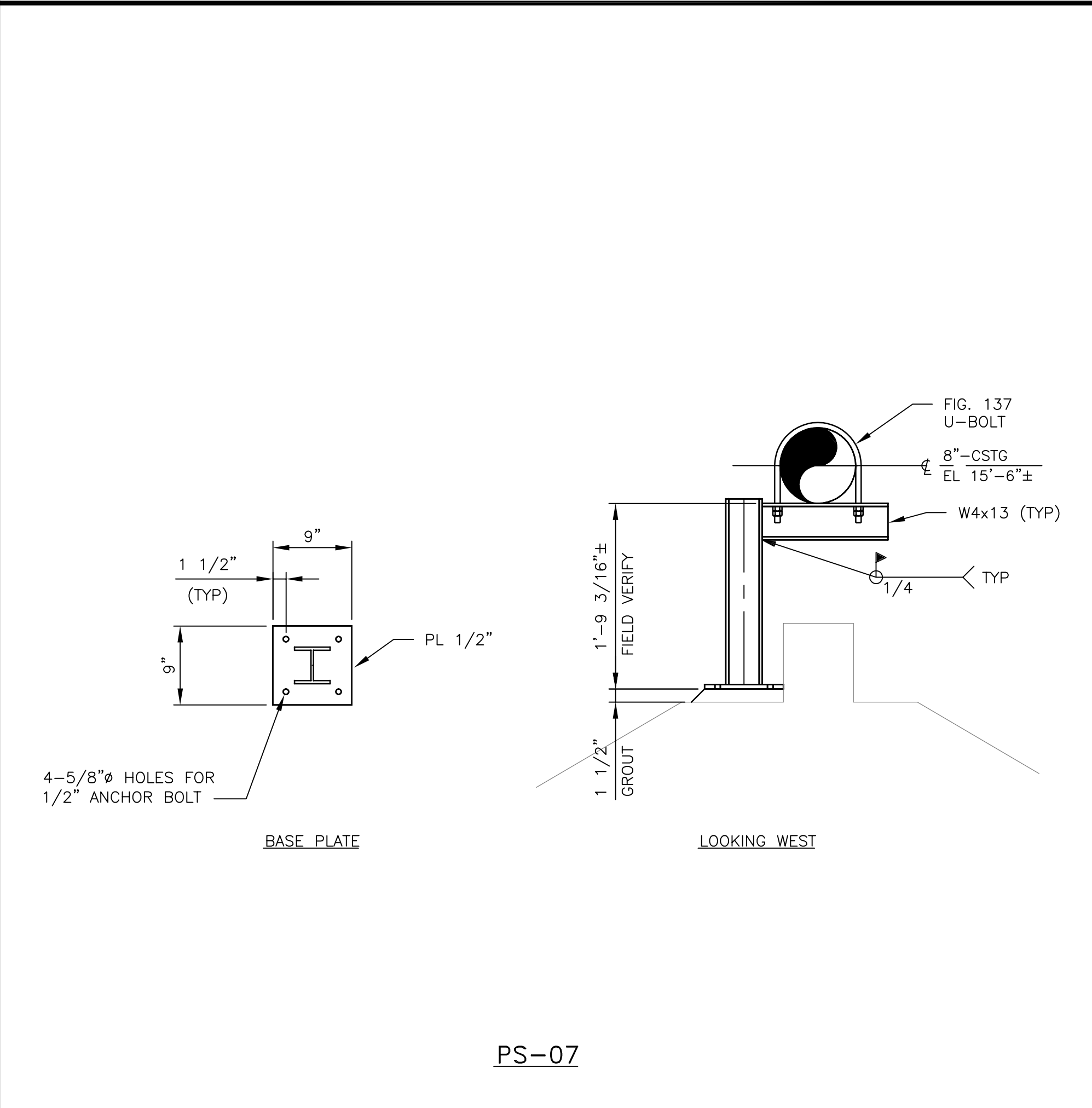
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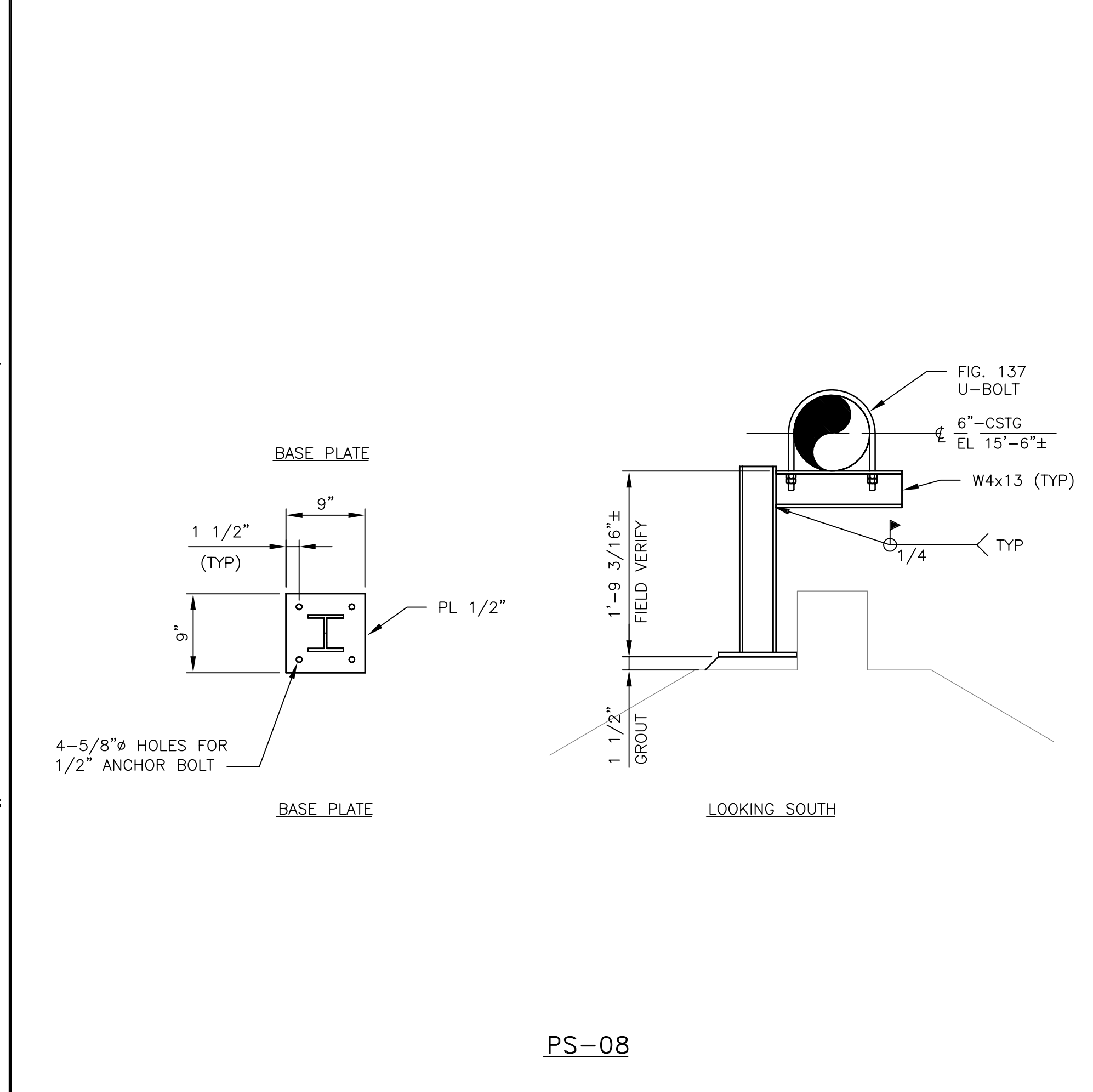
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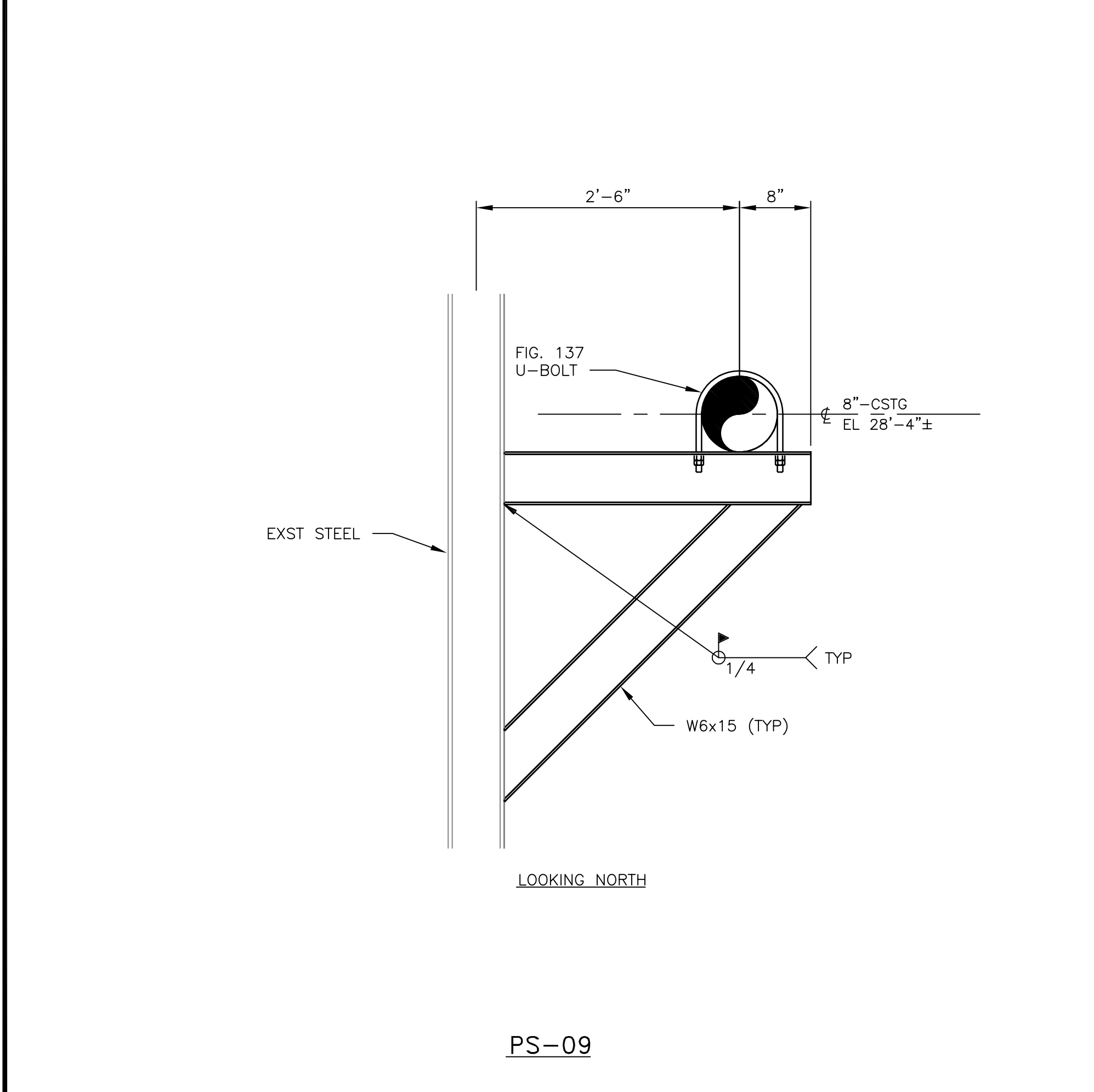
PS-06



PS-07



PS-08



PS-09

PIPE SUPPORT GENERAL NOTES

1. ALL DIMENSIONS SHALL BE FIELD VERIFIED PRIOR TO THE START OF WORK.
2. ALL PIPING WILL BE FULLY SUPPORTED.
3. ALL WELDING TO BE 1/4" FILLET OR FULL PENETRATION, UNLESS OTHERWISE NOTED.
4. ALL PIPE SUPPORTS SHALL BE DESIGNED, FABRICATED, AND INSTALLED IN ACCORDANCE WITH ASME B31.1.
5. PIPE SUPPORT HARDWARE, EXCEPT U-BOLTS, SHALL BE COATED WITH MANUFACTURER'S STANDARD COATING SYSTEM OR GALVANIZED. U-BOLTS SHALL BE GALVANIZED. NO COATING SHALL BE APPLIED TO SUPPORT STEEL SURFACES WITHIN 2 INCHES OF FIELD WELD LOCATIONS.
6. ALL PIPE SUPPORT COMPONENTS SHALL BE PROVIDED BY ANVIL OR PURCHASER APPROVED EQUAL.
7. ALL WIDE FLANGE BEAMS SHALL BE A992. ALL STRUCTURAL TUBE SHALL BE A500, GRADE B. ALL OTHER MISCELLANEOUS STEEL, INCLUDING CHANNEL, ANGLE AND PLATE SHALL BE ASTM A36. ALL WELDS FOR MATERIAL IN THIS NOTE SHALL BE MADE WITH E70 ELECTRODES.
8. ALL POST-INSTALLED MECHANICAL (EXPANSION) ANCHORS, 3/4" AND SMALLER SHALL BE FEDERAL SPECIFICATION A-A-1923A, TYPE 4. ALL POST-INSTALLED ADHESIVE ANCHORS, 3/4" AND LARGER SHALL BE ASTM A193, GRADE B7 WITH ASTM A563 GR DH HEAVY HEXAGON NUTS.
9. FOR CONCRETE NOTES SEE DRAWING S5000.

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 ASD
 1=1

0	01/AUG/2018	APPROVED FOR CONSTRUCTION	DAS	DAS	JAC	MBB	TPD
NO	DATE	REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	PDE	APP

JEA KENNEDY GENERATING STATION FIRE PROTECTION LOOP REPLACEMENT PIPE SUPPORTS		PROJECT NUMBER: 197990-CSTG-M7000	DRAWING NUMBER: 0
CHECKED: JAC	DATE: 01/AUG/2018	AREA:	REFERENCE DWG NUMBER:

BLACK & VEATCH
 2240, 22nd St., Bay Parkway, West
 New York, NY 11514
 Phone: 33296
 FAX: 33297
 CERTIFICATE OF AUTHORIZATION
 No. 1352