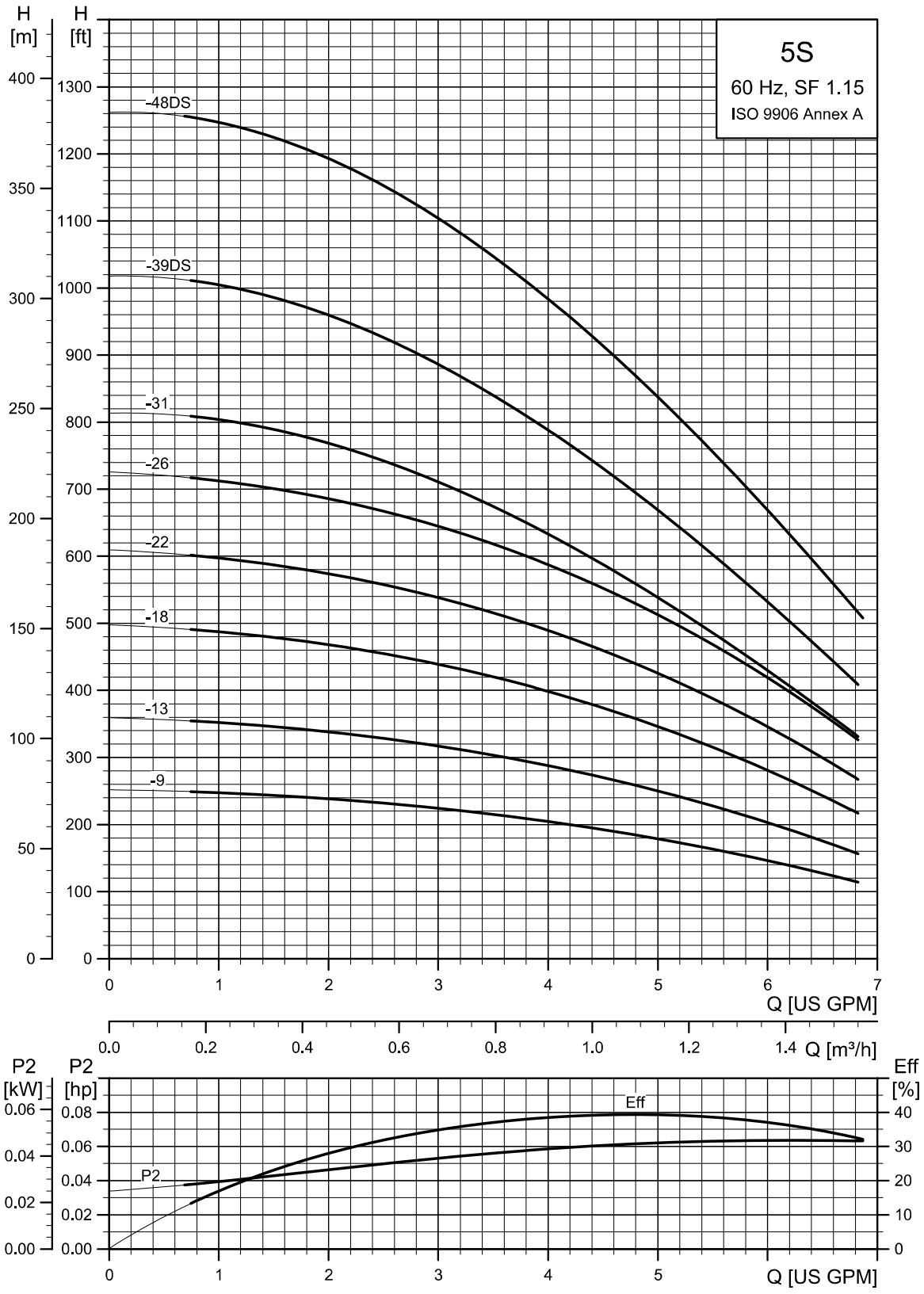
APPENDIX A
SUBMERSIBLE WELL PUMP CURVES AND DATA

6. Curve charts and technical data

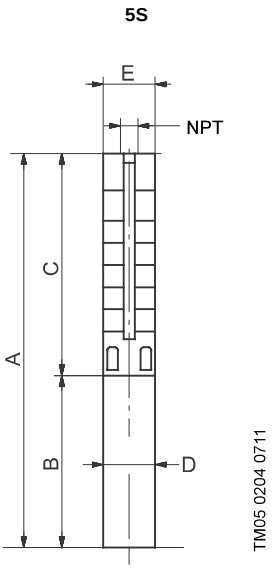
5S (5 gpm)



TM05 0229 0112

5S (5 gpm)

Pump model	Nom. head [ft]	Ph	Volts [V]	Motor [Hp]		Dimensions A [in (mm)]	B [in (mm)]	C [in (mm)]	D [in (mm)]	E [in (mm)]	Net weight (complete) [lb]
5S, motor dia. 4 inch, 2 wire motor, 60 Hz - rated flow 5 gpm (1" NPT)											
5S05-9	171	1	230	0.5	■	24.57 (624)	11.03 (280)	13.55 (344)	3.74 (95)	3.97 (101)	21.6
5S05-13	247	1	115	0.5	■	27.88 (708)	11.03 (280)	16.86 (428)	3.74 (95)	3.97 (101)	26.9
			230	0.5	■	27.88 (708)	11.03 (280)	16.86 (428)	3.74 (95)	3.97 (101)	26.1
5S07-18	343	1	230	0.75	■	32.60 (828)	11.62 (295)	20.99 (533)	3.74 (95)	3.97 (101)	29.7
5S10-22	419	1	230	1	■	36.50 (927)	12.21 (310)	24.30 (617)	3.74 (95)	3.97 (101)	32.4
5S15-26	495	1	230	1.5	■	41.30 (1049)	13.71 (348)	27.60 (701)	3.74 (95)	3.97 (101)	41.4
5S15-31	527	1	230	1.5	■	47.21 (1199)	13.71 (348)	33.51 (851)	3.74 (95)	3.97 (101)	47.7
5S, motor dia. 4 inch, 3 wire motor, 60 Hz - rated flow 5 gpm (1" NPT)											
5S05-9	171	1	230	0.5	■	24.57 (624)	11.03 (280)	13.55 (344)	3.74 (95)	3.97 (101)	22.5
5S05-13	247	1	115	0.5	■	27.88 (708)	11.03 (280)	16.86 (428)	3.74 (95)	3.97 (101)	26.9
			230	0.5	■	27.88 (708)	11.03 (280)	16.86 (428)	3.74 (95)	3.97 (101)	25.2
5S07-18	343	1	230	0.75	■	32.60 (828)	11.62 (295)	20.99 (533)	3.74 (95)	3.97 (101)	28.8
5S10-22	419	1	230	1	■	36.50 (927)	12.21 (310)	24.30 (617)	3.74 (95)	3.97 (101)	32.4
5S15-26	495	1	230	1.5	■	41.30 (1049)	13.71 (348)	27.60 (701)	3.74 (95)	3.97 (101)	37.8
		3	230	1.5	■	39.81 (1011)	12.21 (310)	27.60 (701)	3.74 (95)	3.97 (101)	38.7
			460	1.5	■	39.81 (1011)	12.21 (310)	27.60 (701)	3.74 (95)	3.97 (101)	38.7
5S15-31	527	1	230	1.5	■	47.21 (1199)	13.71 (348)	33.51 (851)	3.74 (95)	3.97 (101)	47.7
		3	230	1.5	■	45.71 (1161)	12.21 (310)	33.51 (851)	3.74 (95)	3.97 (101)	45.0
			460	1.5	■	45.71 (1161)	12.21 (310)	33.51 (851)	3.74 (95)	3.97 (101)	45.0
5S20-39DS	663	1	230	2	•	59.61 (1514)	19.49 (495)	40.12 (1019)	3.74 (95)	3.97 (101)	57.6
		3	230	2	■	53.82 (1367)	13.71 (348)	40.12 (1019)	3.74 (95)	3.97 (101)	54.0
			460	2	■	53.82 (1367)	13.71 (348)	40.12 (1019)	3.74 (95)	3.97 (101)	54.0
5S30-48DS	816	1	230	3	•	70.16 (1782)	22.60 (574)	47.56 (1208)	3.74 (95)	3.97 (101)	77.4
		3	230	3	•	65.56 (1665)	18.00 (457)	47.56 (1208)	3.74 (95)	3.97 (101)	77.4
			460	3	•	65.56 (1665)	18.00 (457)	47.56 (1208)	3.74 (95)	3.97 (101)	77.4

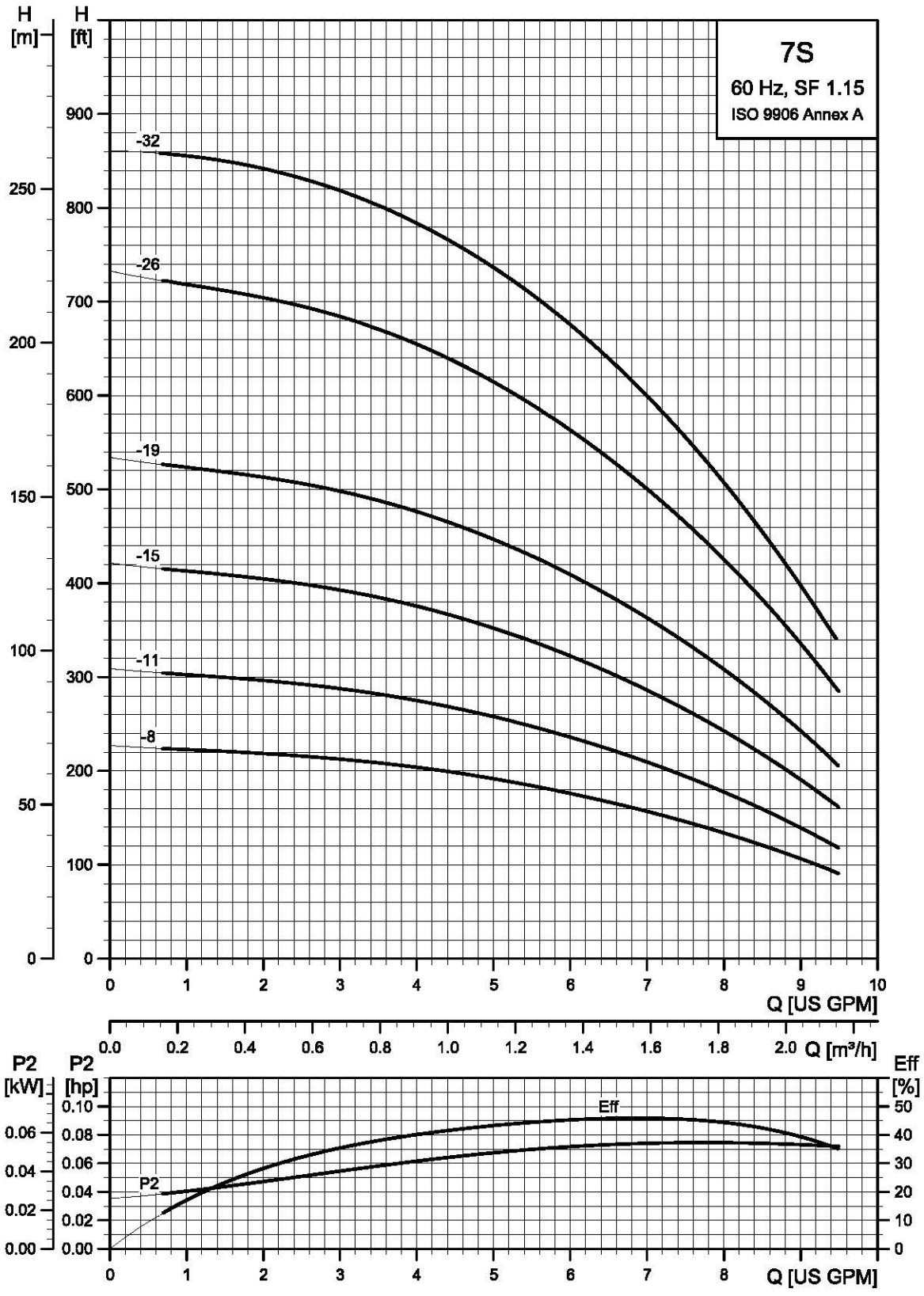


E = Maximum diameter of pump including cable guard and motor.

Notes:
Control box is required for 3-wire, single-phase applications. Data does not include control box.
DS designation = Built into sleeve, 1-1/4" NPT, 6" minimum well diameter.

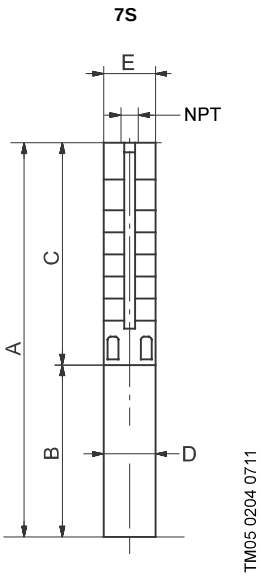
■ MS402 motor.
• MS4000 motor.
▲ MS6 motor.
∧ MMS6000 motor.
★ MMS8000 motor.
♦ Takes MS6 motor; not available as complete.
☼ Takes MMS6000 motor; not available as complete.
* Takes MMS8000 motor; not available as complete.
† Takes MMS10000 motor; not available as complete.

7S (7 gpm)


7S
60 Hz, SF 1.15
ISO 9906 Annex A
H [m]
H [ft]
-32
-26
-19
-15
-11
-8
Q [US GPM]
Q [m³/h]
P2 [kW]
P2 [hp]
Eff [%]
Eff
P2
Q [US GPM]
TM05 0982 0112

7S (7 gpm)

Pump model	Nom. head [ft]	Ph	Volts [V]	Motor [Hp]		Dimensions A [in (mm)]	B [in (mm)]	C [in (mm)]	D [in (mm)]	E [in (mm)]	Net weight (complete) [lb]
7S, motor dia. 4 inch, 2 wire motor, 60 Hz - rated flow 7 gpm (1" NPT)											
7S05-8	151	1	230	.5	■	23.75 (603)	11.03 (280)	12.72 (323)	3.74 (95)	3.97 (101)	21.6
7S05-11	208	1	115	.5	■	26.23 (666)	11.03 (280)	15.20 (386)	3.74 (95)	3.97 (101)	29.7
			230	.5	■	26.23 (666)	11.03 (280)	15.20 (386)	3.74 (95)	3.97 (101)	24.3
7S07-15	283	1	230	.75	■	30.12 (765)	11.62 (295)	18.51 (470)	3.74 (95)	3.97 (101)	29.7
7S10-19	358	1	230	1	■	34.02 (864)	12.21 (310)	21.82 (554)	3.74 (95)	3.97 (101)	32.4
7S15-26	491	1	230	1.5	■	41.3 (1049)	13.71 (348)	27.60 (701)	3.74 (95)	3.97 (101)	41.4
7S, motor dia. 4 inch, 3 wire motor, 60 Hz - rated flow 7 gpm (1" NPT)											
7S05-8	151	1	230	.5	■	23.75 (603)	11.03 (280)	12.72 (323)	3.74 (95)	3.97 (101)	21.6
7S05-11	208	1	115	.5	■	26.23 (666)	11.03 (280)	15.20 (386)	3.74 (95)	3.97 (101)	21.6
			230	.5	■	26.23 (666)	11.03 (280)	15.20 (386)	3.74 (95)	3.97 (101)	30.6
7S07-15	283	1	230	.75	■	30.12 (765)	11.62 (295)	18.51 (470)	3.74 (95)	3.97 (101)	27.9
7S10-19	358	1	230	1	■	34.02 (864)	12.21 (310)	21.82 (554)	3.74 (95)	3.97 (101)	39.6
7S15-26	491	1	230	1.5	■	41.30 (1049)	13.71 (348)	27.60 (701)	3.74 (95)	3.97 (101)	38.7
		3	230	1.5	■	39.81 (1011)	12.21 (310)	27.60 (701)	3.74 (95)	3.97 (101)	38.7
			460	1.5	■	39.81 (1011)	12.21 (310)	27.60 (701)	3.74 (95)	3.97 (101)	38.7
7S20-32	604	1	230	2	•	52.05 (1322)	19.49 (495)	32.56 (827)	3.74 (95)	3.97 (101)	48.5
		3	230	2	■	46.26 (1175)	13.71 (348)	32.56 (827)	3.74 (95)	3.97 (101)	48.5
			460	2	■	46.26 (1175)	13.71 (348)	32.56 (827)	3.74 (95)	3.97 (101)	48.5

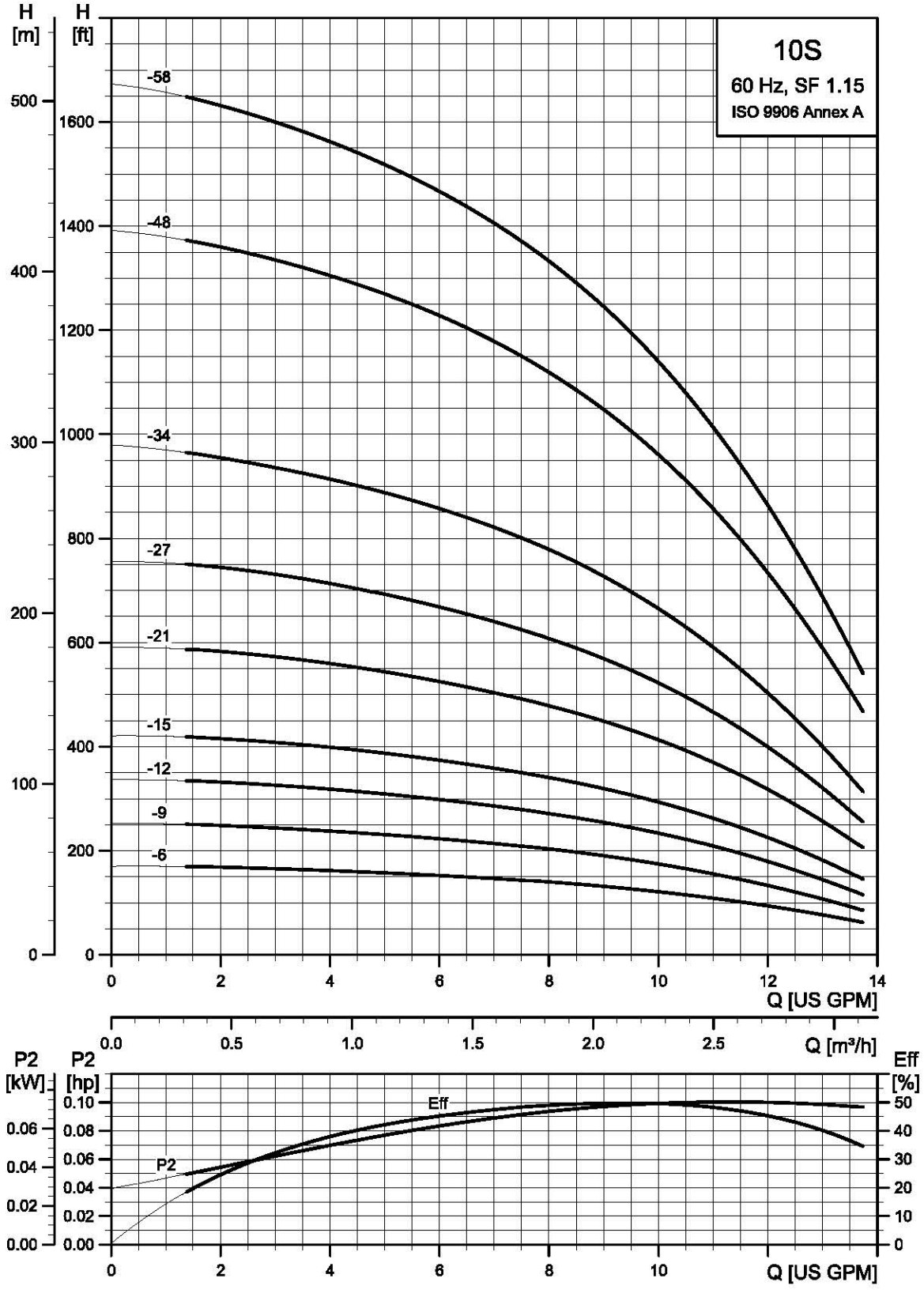


E = Maximum diameter of pump including cable guard and motor.

Notes:
Control box is required for 3-wire, single-phase applications. Data does not include control box.

■ MS402 motor.
• MS4000 motor.
▲ MS6 motor.
∧ MMS6000 motor.
★ MMS8000 motor.
♦ Takes MS6 motor; not available as complete.
☼ Takes MMS6000 motor; not available as complete.
* Takes MMS8000 motor; not available as complete.
† Takes MMS10000 motor; not available as complete.

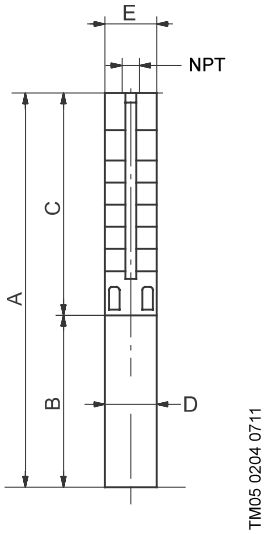
10S (10 gpm)


10S
60 Hz, SF 1.15
ISO 9906 Annex A
H [m]
H [ft]
-58
-48
-34
-27
-21
-15
-12
-9
-6
Q [US GPM]
Q [m³/h]
P2 [kW]
P2 [hp]
Eff [%]
Eff
P2
Q [US GPM]
TM05 0230 0112

10S (10 gpm)

Pump model	Nom. head [ft]	Ph	Volts [V]	Motor [Hp]		Dimensions A [in (mm)]	B [in (mm)]	C [in (mm)]	D [in (mm)]	E [in (mm)]	Net weight (complete) [lb]
10S, motor dia. 4 inch, 2 wire motor, 60 Hz - rated flow 10 gpm (1.25" NPT)											
10S05-6	116	1	230	.5	■	22.05 (560)	10.99 (279)	11.07 (281)	3.74 (95)	3.97 (101)	20.7
10S05-9	174	1	115	.5	■	24.53 (623)	10.99 (279)	13.55 (344)	3.74 (95)	3.97 (101)	24.3
			230	.5	■	24.53 (623)	10.99 (279)	13.55 (344)	3.74 (95)	3.97 (101)	23.4
10S07-12	233	1	230	.75	■	27.60 (701)	11.58 (294)	16.03 (407)	3.74 (95)	3.97 (101)	24.3
10S10-15	291	1	230	1	■	30.67 (779)	12.17 (309)	18.51 (470)	3.74 (95)	3.97 (101)	29.7
10S15-21	407	1	230	1.5	■	37.17 (944)	13.71 (348)	23.47 (596)	3.74 (95)	3.97 (101)	35.1
10S, motor dia. 4 inch, 3 wire motor, 60 Hz - rated flow 10 gpm (1.25" NPT)											
10S05-6	116	1	230	.5	■	24.77 (629)	13.71 (348)	11.07 (281)	3.74 (95)	3.97 (101)	21.6
10S05-9	174	1	115	.5	■	24.53 (623)	10.99 (279)	13.55 (344)	3.74 (95)	3.97 (101)	25.4
			230	.5	■	24.53 (623)	10.99 (279)	13.55 (344)	3.74 (95)	3.97 (101)	24.3
10S07-12	233	1	230	.75	■	27.60 (701)	11.58 (294)	16.03 (407)	3.74 (95)	3.97 (101)	28.8
10S10-15	291	1	230	1	■	30.67 (779)	12.17 (309)	18.51 (470)	3.74 (95)	3.97 (101)	29.7
10S15-21	407	1	230	1.5	■	37.17 (944)	13.71 (348)	23.47 (596)	3.74 (95)	3.97 (101)	35.1
		3	230	1.5	■	35.63 (905)	12.17 (309)	23.47 (596)	3.74 (95)	3.97 (101)	32.4
			460	1.5	■	35.63 (905)	12.17 (309)	23.47 (596)	3.74 (95)	3.97 (101)	36.0
10S20-27	524	1	230	2	•	47.92 (1217)	19.49 (495)	28.43 (722)	3.74 (95)	3.97 (101)	45.9
		3	230	2	■	42.13 (1070)	13.71 (348)	28.43 (722)	3.74 (95)	3.97 (101)	44.1
			460	2	■	42.13 (1070)	13.71 (348)	28.43 (722)	3.74 (95)	3.97 (101)	44.1
10S30-34	659	1	230	3	•	58.59 (1488)	22.6 (574)	35.99 (914)	3.74 (95)	3.97 (101)	81.9
		3	230	3	•	53.98 (1371)	18.00 (457)	35.99 (914)	3.74 (95)	3.97 (101)	74.7
			460	3	•	53.98 (1371)	18.00 (457)	35.99 (914)	3.74 (95)	3.97 (101)	74.7
10S50-48DS	931	1	230	5	•	74.18 (1884)	26.62 (676)	47.56 (1208)	3.74 (95)	3.97 (101)	103.5
		3	230	5	•	70.16 (1782)	22.60 (574)	47.56 (1208)	3.74 (95)	3.97 (101)	103.5
			460	5	•	70.16 (1782)	22.60 (574)	47.56 (1208)	3.74 (95)	3.97 (101)	103.5
10S50-58DS	1124	1	230	5	•	89.49 (2272)	26.62 (676)	62.88 (1597)	3.74 (95)	4.25 (108)	132.3
		3	230	5	•	85.48 (2171)	22.60 (574)	62.88 (1597)	3.74 (95)	4.25 (108)	132.3
			460	5	•	85.48 (2171)	22.60 (574)	62.88 (1597)	3.74 (95)	4.25 (108)	132.3

10S

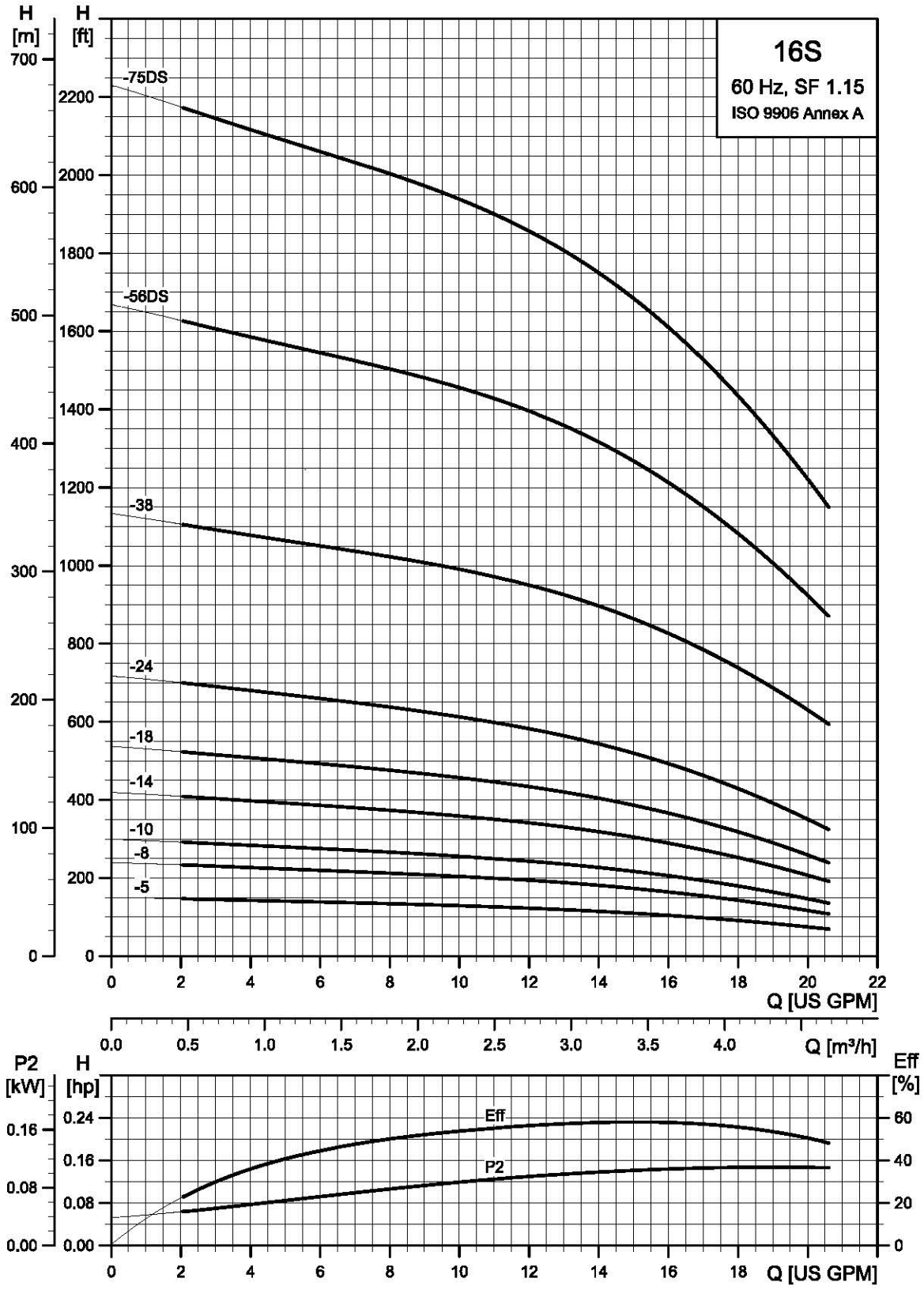


E = Maximum diameter of pump including cable guard and motor.

Notes:
Control box is required for 3-wire, single-phase applications. Data does not include control box.
DS designation = Built into sleeve, 1-1/4" NPT, 6" minimum well diameter.

■ MS402 motor.
• MS4000 motor.
▲ MS6 motor.
∧ MMS6000 motor.
★ MMS8000 motor.
♦ Takes MS6 motor; not available as complete.
☼ Takes MMS6000 motor; not available as complete.
* Takes MMS8000 motor; not available as complete.
† Takes MMS10000 motor; not available as complete.

16S (16 gpm)


16S
60 Hz, SF 1.15
ISO 9906 Annex A
H [m]
H [ft]
-75DS
-56DS
-38
-24
-18
-14
-10
-8
-5
Q [US GPM]
Q [m³/h]
P2 [kW]
H [hp]
Eff [%]
Eff
P2
Q [US GPM]
TM05 0231 0112

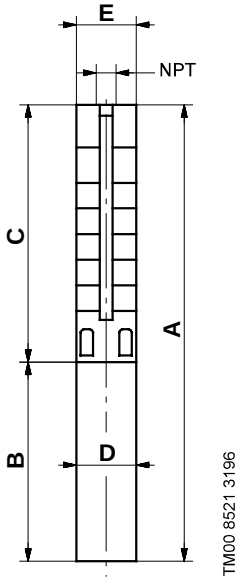
16S (16 gpm)

Pump model	Nom. head [ft]	Ph	Volts [V]	Motor [Hp]		Dimensions A [in (mm)]	B [in (mm)]	C [in (mm)]	D [in (mm)]	E [in (mm)]	Net weight (complete) [lb]
16S, motor dia. 4 inch, 2 wire motor, 60 Hz - rated flow 16 gpm (1.25" NPT)											
16S05-5	102	1	115	.5	■	21.26 (540)	11.03 (280)	10.24 (260)	3.74 (95)	3.97 (101)	21.6
			230	.5	■	21.26 (540)	11.03 (280)	10.24 (260)	3.74 (95)	3.97 (101)	23.4
16S07-8	162	1	230	.75	■	24.34 (618)	11.62 (295)	12.72 (323)	3.74 (95)	3.97 (101)	24.3
16S10-10	203	1	230	1	■	26.58 (675)	12.21 (310)	14.38 (365)	3.74 (95)	3.97 (101)	27.9
16S15-14	284	1	230	1.5	■	31.38 (797)	13.71 (348)	17.68 (449)	3.74 (95)	3.97 (101)	36.0
16S, motor dia. 4 inch, 3 wire motor, 60 Hz - rated flow 16 gpm (1.25" NPT)											
16S05-5	102	1	115	.5	■	21.26 (540)	11.03 (280)	10.24 (260)	3.74 (95)	3.97 (101)	21.6
			230	.5	■	21.26 (540)	11.03 (280)	10.24 (260)	3.74 (95)	3.97 (101)	21.6
16S07-8	162	1	230	.75	■	24.34 (618)	11.62 (295)	12.72 (323)	3.74 (95)	3.97 (101)	27.0
16S10-10	203	1	230	1	■	26.58 (675)	12.21 (310)	14.38 (365)	3.74 (95)	3.97 (101)	27.9
16S15-14	284	1	230	1.5	●	31.38 (797)	13.71 (348)	17.68 (449)	3.74 (95)	3.97 (101)	32.4
		3	230	1.5	■	29.89 (759)	12.21 (310)	17.68 (449)	3.74 (95)	3.97 (101)	28.8
			460	1.5	■	29.89 (759)	12.21 (310)	17.68 (449)	3.74 (95)	3.97 (101)	28.8
16S20-18	366	1	230	2	●	40.48 (1028)	19.49 (495)	20.99 (533)	3.74 (95)	3.97 (101)	36.0
		3	230	2	■	34.69 (881)	13.71 (348)	20.99 (533)	3.74 (95)	3.97 (101)	36.0
			460	2	■	34.69 (881)	13.71 (348)	20.99 (533)	3.74 (95)	3.97 (101)	36.0
16S30-24	487	1	230	3	●	48.55 (1233)	22.60 (574)	25.95 (659)	3.74 (95)	3.97 (101)	62.1
		3	230	3	●	43.94 (1116)	18.00 (457)	25.95 (659)	3.74 (95)	3.97 (101)	57.6
			460	3	●	43.94 (1116)	18.00 (457)	25.95 (659)	3.74 (95)	3.97 (101)	57.6
16S50-38	814	1	230	5	●	65.91 (1674)	26.62 (676)	39.30 (998)	3.74 (95)	3.97 (101)	97.2
		3	230	5	●	62.01 (1575)	22.72 (577)	39.30 (998)	3.74 (95)	3.97 (101)	90.0
			460	5	●	62.01 (1575)	22.72 (577)	39.30 (998)	3.74 (95)	3.97 (101)	90.0
SP 16S, motor dia. 6 inch, 3 wire motor, 60 Hz - rated flow 16 gpm (1.25" NPT)											
16S75-56DS	1200	3	230	7.5	▲	95.40 (2423)	26.62 (676)	68.78 (1747)	5.63 (143)	5.51 (140)	165.1
			460	7.5	▲	95.40 (2423)	26.62 (676)	68.78 (1747)	5.63 (143)	5.51 (140)	165.1
16S100-75DS	1607	3	460	10	▲	115.08 (2923)	30.60 (777)	84.49 (2146)	5.63 (143)	5.51 (140)	190.0

Notes:
Control box is required for 3-wire, single-phase applications. Data does not include control box.
DS designation = Built into sleeve, 1-1/4" NPT, 6" minimum well diameter.

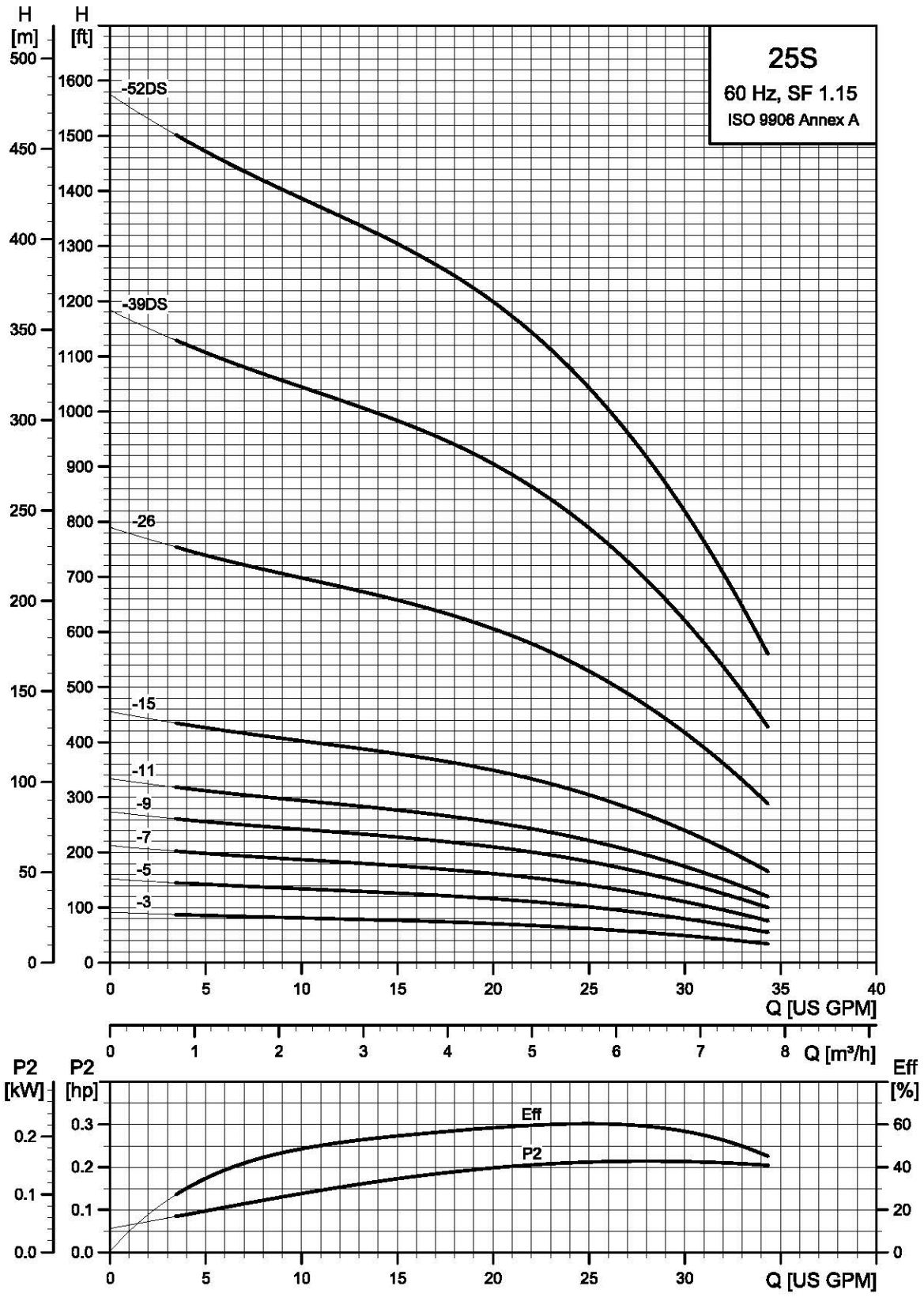
■ MS402 motor.
● MS4000 motor.
▲ MS6 motor.
∧ MMS6000 motor.
★ MMS8000 motor.
♦ Takes MS6 motor; not available as complete.
☼ Takes MMS6000 motor; not available as complete.
* Takes MMS8000 motor; not available as complete.
† Takes MMS10000 motor; not available as complete.

16S



E = Maximum diameter of pump including cable guard and motor.

25S (25 gpm)


25S
60 Hz, SF 1.15
ISO 9906 Annex A
H [m]
H [ft]
-52DS
-39DS
-26
-15
-11
-9
-7
-5
-3
Q [US GPM]
Q [m³/h]
P2 [kW]
P2 [hp]
Eff [%]
Eff
P2
Q [US GPM]
TM05 0232 0112

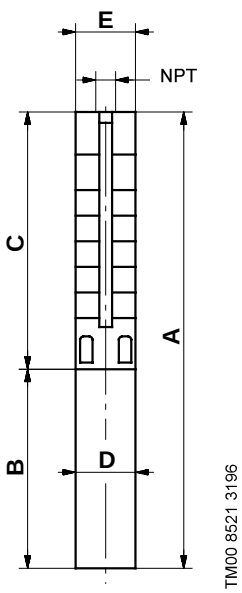
25S (25 gpm)

Pump model	Nom. head [ft]	Ph	Volts [V]	Motor [Hp]		Dimensions A [in (mm)]	B [in (mm)]	C [in (mm)]	D [in (mm)]	E [in (mm)]	Net weight (complete) [lb]
25S, motor dia. 4 inch, 2 wire motor, 60 Hz - rated flow 25 gpm (1.5" NPT)											
25S05-3	60	1	115	.5	■	19.61 (498)	11.03 (280)	8.59 (218)	3.74 (95)	3.97 (101)	21.6
			230	.5	■	19.61 (498)	11.03 (280)	8.59 (218)	3.74 (95)	3.97 (101)	21.6
25S07-5	99	1	230	.75	■	21.86 (555)	11.62 (295)	10.24 (260)	3.74 (95)	3.97 (101)	23.4
25S10-7	139	1	230	1	■	24.10 (612)	12.21 (310)	11.89 (302)	3.74 (95)	3.97 (101)	25.2
25S15-9	179	1	230	1.5	■	27.25 (692)	13.71 (348)	13.55 (344)	3.74 (95)	3.97 (101)	28.8
25S, motor dia. 4 inch, 3 wire motor, 60 Hz - rated flow 25 gpm (1.5" NPT)											
25S05-3	60	1	115	.5	■	19.61 (498)	11.03 (280)	8.59 (218)	3.74 (95)	3.97 (101)	21.6
			230	.5	■	19.61 (498)	11.03 (280)	8.59 (218)	3.74 (95)	3.97 (101)	21.6
25S07-5	99	1	230	.75	■	21.86 (555)	11.62 (295)	10.24 (260)	3.74 (95)	3.97 (101)	23.4
25S10-7	139	1	230	1	■	24.10 (612)	12.21 (310)	11.89 (302)	3.74 (95)	3.97 (101)	25.2
25S15-9	179	1	230	1.5	■	27.25 (692)	13.71 (348)	13.55 (344)	3.74 (95)	3.97 (101)	29.7
		3	230	1.5	■	25.75 (654)	12.21 (310)	13.55 (344)	3.74 (95)	3.97 (101)	27.0
			460	1.5	■	25.75 (654)	12.21 (310)	13.55 (344)	3.74 (95)	3.97 (101)	28.8
25S20-11	219	1	230	2	●	34.69 (881)	19.49 (495)	15.20 (386)	3.74 (95)	3.97 (101)	33.1
		3	230	2	■	28.90 (734)	13.71 (348)	15.20 (386)	3.74 (95)	3.97 (101)	37.0
			460	2	■	28.90 (734)	13.71 (348)	15.20 (386)	3.74 (95)	3.97 (101)	33.3
25S30-15	298	1	230	3	●	41.11 (1044)	22.60 (574)	18.51 (470)	3.74 (95)	3.97 (101)	61.2
		3	230	3	●	36.50 (927)	18.00 (457)	18.51 (470)	3.74 (95)	3.97 (101)	53.1
			460	3	●	36.50 (927)	18.00 (457)	18.51 (470)	3.74 (95)	3.97 (101)	53.1
25S50-26	517	1	230	5	●	54.22 (1377)	26.62 (676)	27.60 (701)	3.74 (95)	3.97 (101)	72.9
		3	230	5	●	50.32 (1278)	22.72 (577)	27.60 (701)	3.74 (95)	3.97 (101)	72.9
			460	5	●	50.32 (1278)	22.72 (577)	27.60 (701)	3.74 (95)	3.97 (101)	72.9
SP 25S, motor dia. 6 inch, 3 wire motor, 60 Hz - rated flow 25 gpm (1.5" NPT)											
25S75-39DS	775	3	230	7.5	▲	64.81 (1646)	22.25 (565)	42.56 (1081)	5.63 (143)	5.43 (138)	122.1
			460	7.5	▲	64.81 (1646)	22.25 (565)	42.56 (1081)	5.63 (143)	5.43 (138)	122.1
25S100-52DS	1034	3	460	10	▲	88.71 (2253)	23.23 (590)	65.48 (1663)	5.63 (143)	5.51 (140)	163.1

Notes:
Control box is required for 3-wire, single-phase applications. Data does not include control box.
DS designation = Built into sleeve, 1-1/2" NPT, 6" minimum well diameter.

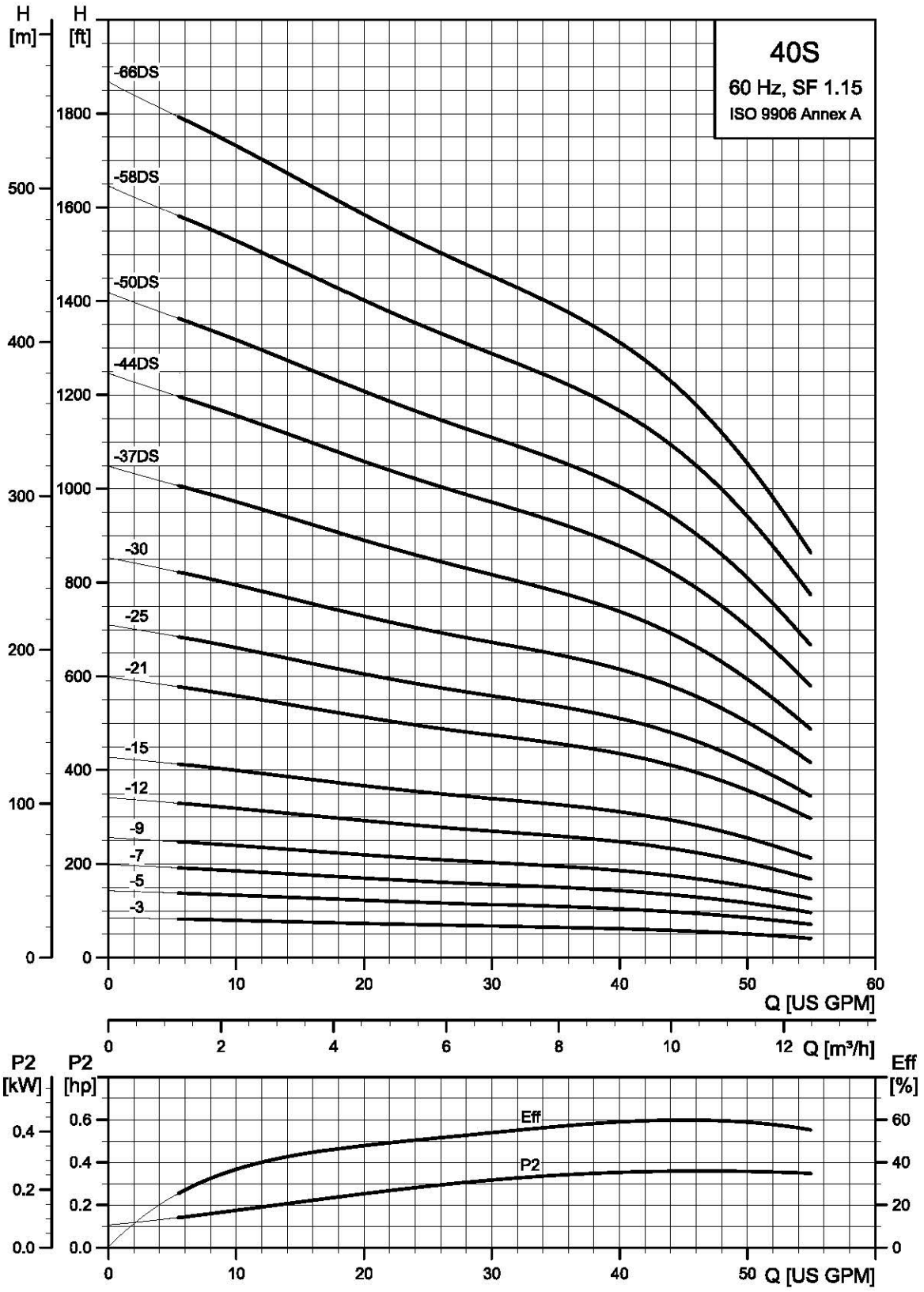
■ MS402 motor.
● MS4000 motor.
▲ MS6 motor.
∧ MMS6000 motor.
★ MMS8000 motor.
♦ Takes MS6 motor; not available as complete.
☼ Takes MMS6000 motor; not available as complete.
* Takes MMS8000 motor; not available as complete.
† Takes MMS10000 motor; not available as complete.

25S



E = Maximum diameter of pump including cable guard and motor.

40S (40 gpm)


40S
60 Hz, SF 1.15
ISO 9906 Annex A
H [m]
H [ft]
-66DS
-58DS
-50DS
-44DS
-37DS
-30
-25
-21
-15
-12
-9
-7
-5
-3
Q [US GPM]
Q [m³/h]
P2 [kW]
P2 [hp]
Eff [%]
Eff
P2
Q [US GPM]
TM05 0233 0112

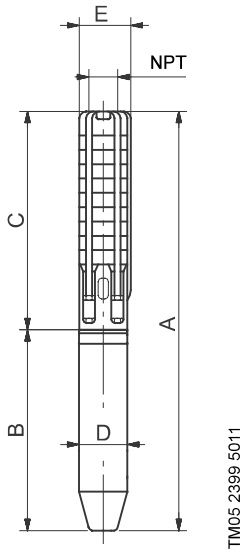
40S (40 gpm)

Pump model	Nom. head [ft]	Ph	Volts [V]	Motor [Hp]		Dimensions A [in (mm)]	B [in (mm)]	C [in (mm)]	D [in (mm)]	E [in (mm)]	Net weight (complete) [lb]
40S - Motor dia. 4 inch, 2 wire motor, 60 Hz, rated flow 40 gpm (2" NPT)											
40S10-3	60	1	230	1	■	25.00 (635)	12.21 (310)	12.80 (325)	3.74 (95)	3.97 (101)	26.1
40S10-5	102	1	230	1.5	■	29.81 (757)	13.71 (348)	16.11 (409)	3.74 (95)	3.97 (101)	30.6
40S - Motor dia. 4 inch, 3 wire motor, 60 Hz, rated flow 40 gpm (2" NPT)											
40S10-3	61	1	230	1	■	25.00 (635)	12.21 (310)	12.8 (325)	3.74 (95)	3.97 (101)	26.1
40S15-5	102	1	230	1.5	■	29.81 (757)	13.71 (348)	16.11 (409)	3.74 (95)	3.97 (101)	30.6
		3	230	1.5	■	28.31 (719)	12.21 (310)	16.11 (409)	3.74 (95)	3.97 (101)	30.6
			460	1.5	■	28.31 (719)	12.21 (310)	16.11 (409)	3.74 (95)	3.97 (101)	30.6
40S20-7	143	1	230	2	●	38.90 (988)	19.49 (495)	19.41 (493)	3.74 (95)	3.97 (101)	36.9
		3	230	2	■	33.12 (841)	13.71 (348)	19.41 (493)	3.74 (95)	3.97 (101)	36.9
			460	2	■	33.12 (841)	13.71 (348)	19.41 (493)	3.74 (95)	3.97 (101)	36.9
40S30-9	184	1	230	3	●	45.32 (1151)	22.60 (574)	22.72 (577)	3.74 (95)	3.97 (101)	74.1
		3	230	3	●	40.71 (1034)	18.00 (457)	22.72 (577)	3.74 (95)	3.97 (101)	81.0
			460	3	●	40.71 (1034)	18.00 (457)	22.72 (577)	3.74 (95)	3.97 (101)	74.7
40S50-12	245	1	230	5	●	54.30 (1379)	26.62 (676)	27.68 (703)	3.74 (95)	3.97 (101)	81.0
		3	230	5	●	50.40 (1280)	22.72 (577)	27.68 (703)	3.74 (95)	3.97 (101)	74.7
			460	5	●	50.40 (1280)	22.72 (577)	27.68 (703)	3.74 (95)	3.97 (101)	74.7
40S50-15	307	1	230	5	●	59.26 (1505)	26.62 (676)	32.64 (829)	3.74 (95)	3.97 (101)	80.1
		3	230	5	●	55.36 (1406)	22.72 (577)	32.64 (829)	3.74 (95)	3.97 (101)	80.1
			460	5	●	55.36 (1406)	22.72 (577)	32.64 (829)	3.74 (95)	3.97 (101)	80.1
40S - Motor dia. 6 inch, 3 wire motor, 60 Hz, rated flow 40 gpm (2" NPT)											
40S75-21	429	3	230	7.5	●	69.22 (1758)	26.66 (677)	42.56 (1081)	3.74 (95)	3.97 (101)	113.3
			460	7.5	●	69.22 (1758)	26.66 (677)	42.56 (1081)	3.74 (95)	3.97 (101)	113.3
40S75-25	511	3	230	7.5	●	75.83 (1926)	26.66 (677)	49.18 (1249)	3.74 (95)	3.97 (101)	92.4
			460	7.5	●	75.83 (1926)	26.66 (677)	49.18 (1249)	3.74 (95)	3.97 (101)	92.4
40S100-30	613	3	460	10	●	88.04 (2236)	30.60 (777)	57.45 (1459)	3.74 (95)	3.97 (101)	166.0
40S150-37DS	756	3	230	15	▲	99.34 (2523)	27.88 (708)	71.46 (1815)	5.63 (143)	5.43 (138)	151.9
			460	15	▲	99.34 (2523)	27.88 (708)	71.46 (1815)	5.63 (143)	5.43 (138)	151.9
40S150-44DS	899	3	230	15	▲	110.91 (2817)	27.88 (708)	83.04 (2109)	5.63 (143)	5.43 (138)	165.1
			460	15	▲	110.91 (2817)	27.88 (708)	83.04 (2109)	5.63 (143)	5.43 (138)	151.9
40S200-50DS	1022	3	230	20	▲	136.23 (3460)	30.83 (783)	105.4 (2677)	5.63 (143)	5.51 (140)	226.9
			460	20	▲	136.23 (3460)	30.83 (783)	105.4 (2677)	5.63 (143)	5.51 (140)	226.9
40S200-58DS	1186	3	230	20	▲	149.45 (3796)	30.83 (783)	118.63 (3013)	5.63 (143)	5.51 (140)	251.1
			460	20	▲	149.45 (3796)	30.83 (783)	118.63 (3013)	5.63 (143)	5.51 (140)	251.1
40S200-66DS	1349	3	230	20	▲	162.68 (4132)	30.83 (783)	131.86 (3349)	5.63 (143)	5.51 (140)	266.5
			460	20	▲	162.68 (4132)	30.83 (783)	131.86 (3349)	5.63 (143)	5.51 (140)	266.5

Notes:
Control box is required for 3-wire, single-phase applications. Data does not include control box.
DS designation = Built into sleeve, 2" NPT, 6" minimum well diameter.

■ MS402 motor.
● MS4000 motor.
▲ MS6 motor.
∧ MMS6000 motor.
★ MMS8000 motor.
♦ Takes MS6 motor; not available as complete.
☼ Takes MMS6000 motor; not available as complete.
* Takes MMS8000 motor; not available as complete.
† Takes MMS10000 motor; not available as complete.

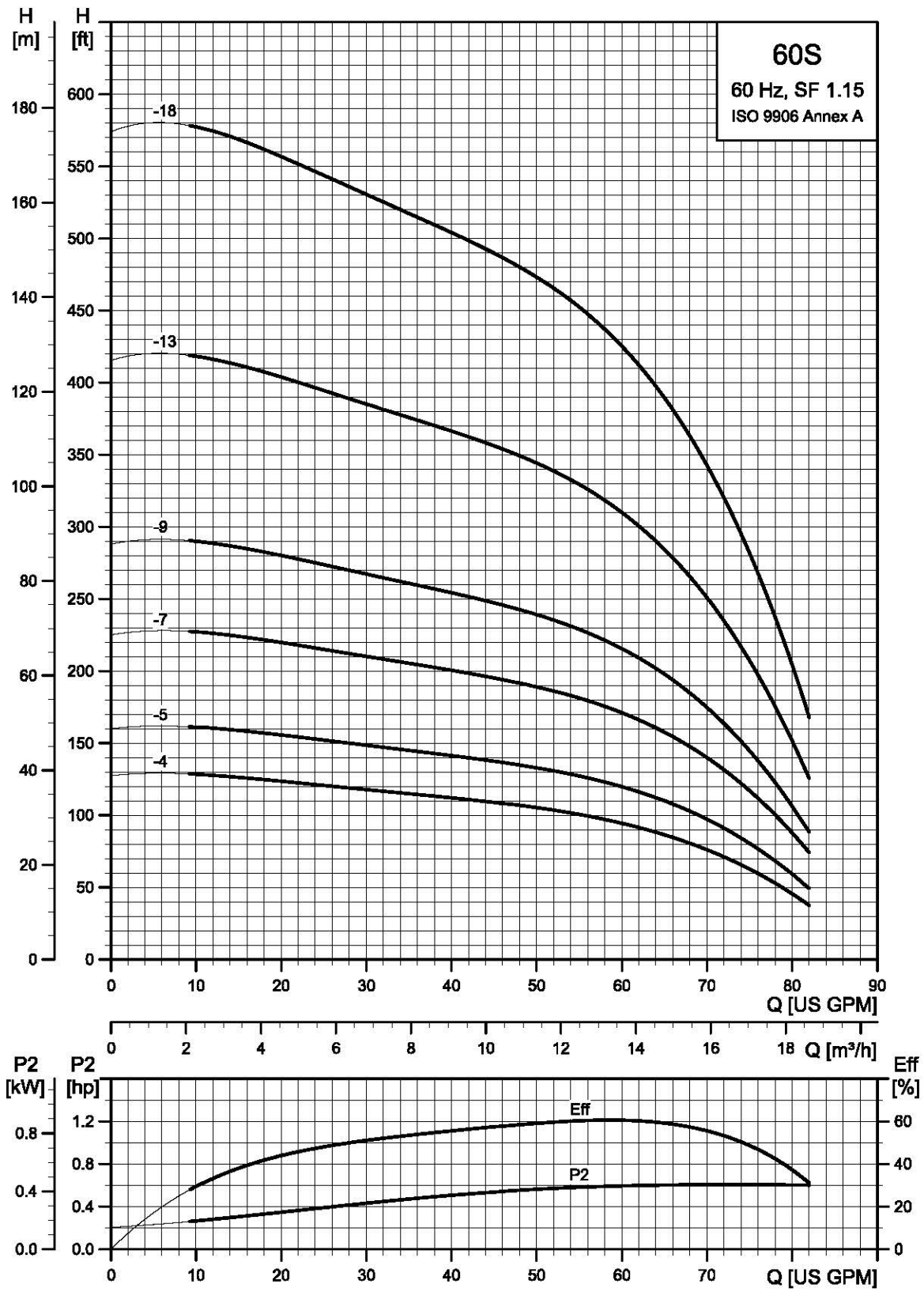
40S



TM05 2399 5011

E = Maximum diameter of pump including cable guard and motor.

60S (60 gpm)


60S
60 Hz, SF 1.15
ISO 9906 Annex A
H [m]
H [ft]
-18
-13
-9
-7
-5
-4
Q [US GPM]
Q [m³/h]
P2 [kW]
P2 [hp]
Eff [%]
Eff
P2
Q [US GPM]
TM05 1736 0112

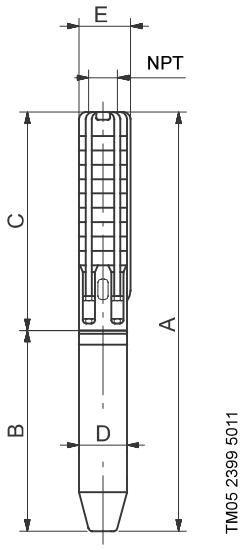
60S (60 gpm)

Pump model	Nom. head [ft]	Ph	Volts [V]	Motor [Hp]		Dimensions A [in (mm)]	B [in (mm)]	C [in (mm)]	D [in (mm)]	E [in (mm)]	Net weight (complete) [lb]
60S - Motor dia. 4 inch, 3 wire motor, 60 Hz, rated flow 60 gpm (2" NPT)											
60S20-4	93	1	230	2	●	37.01 (940)	19.49 (495)	17.52 (445)	3.74 (95)	3.97 (101)	36.0
		3	230	2	■	31.23 (793)	13.71 (348)	17.52 (445)	3.74 (95)	3.97 (101)	36.0
			460	2	■	31.23 (793)	13.71 (348)	17.52 (445)	3.74 (95)	3.97 (101)	36.0
60S30-5	117	1	230	3	●	42.68 (1084)	22.60 (574)	20.08 (510)	3.74 (95)	3.97 (101)	61.2
		3	230	3	●	38.08 (967)	18.00 (457)	20.08 (510)	3.74 (95)	3.97 (101)	49.5
			460	3	●	38.08 (967)	18.00 (457)	20.08 (510)	3.74 (95)	3.97 (101)	58.5
60S50-7	164	1	230	5	●	51.82 (1316)	26.62 (676)	25.20 (640)	3.74 (95)	3.97 (101)	81.0
		3	230	5	●	47.92 (1217)	22.72 (577)	25.20 (640)	3.74 (95)	3.97 (101)	49.5
			460	5	●	47.92 (1217)	22.72 (577)	25.20 (640)	3.74 (95)	3.97 (101)	72.0
60S50-9	210	1	230	5	●	56.93 (1446)	26.62 (676)	30.32 (770)	3.74 (95)	3.97 (101)	85.5
		3	230	5	●	53.04 (1347)	22.72 (577)	30.32 (770)	3.74 (95)	3.97 (101)	76.5
			460	5	●	53.04 (1347)	22.72 (577)	30.32 (770)	3.74 (95)	3.97 (101)	76.5
60S75-13	304	3	230	7.5	●	67.21 (1707)	26.66 (677)	40.56 (1030)	3.74 (95)	3.97 (101)	83.3
			460	7.5	●	67.21 (1707)	26.66 (677)	40.56 (1030)	3.74 (95)	3.97 (101)	136.8
60S100-18	420	3	460	10	●	83.94 (2132)	30.60 (777)	53.35 (1355)	3.74 (95)	3.97 (101)	175.5
60S - Motor dia. 6 inch, 3 wire motor, 60 Hz, rated flow 60 gpm (2" NPT)											
60S75-13	304	3	230	7.5	▲	65.24 (1657)	22.25 (565)	43.00 (1092)	5.63 (143)	5.43 (138)	136.8
			460	7.5	▲	65.24 (1657)	22.25 (565)	43.00 (1092)	5.63 (143)	5.43 (138)	136.8
60S100-18	420	3	230	10	▲	79.02 (2007)	23.23 (590)	55.79 (1417)	5.63 (143)	5.43 (138)	207.0
			460	10	▲	79.02 (2007)	23.23 (590)	55.79 (1417)	5.63 (143)	5.43 (138)	207.0

Notes:
Control box is required for 3-wire, single-phase applications. Data does not include control box.diameter.

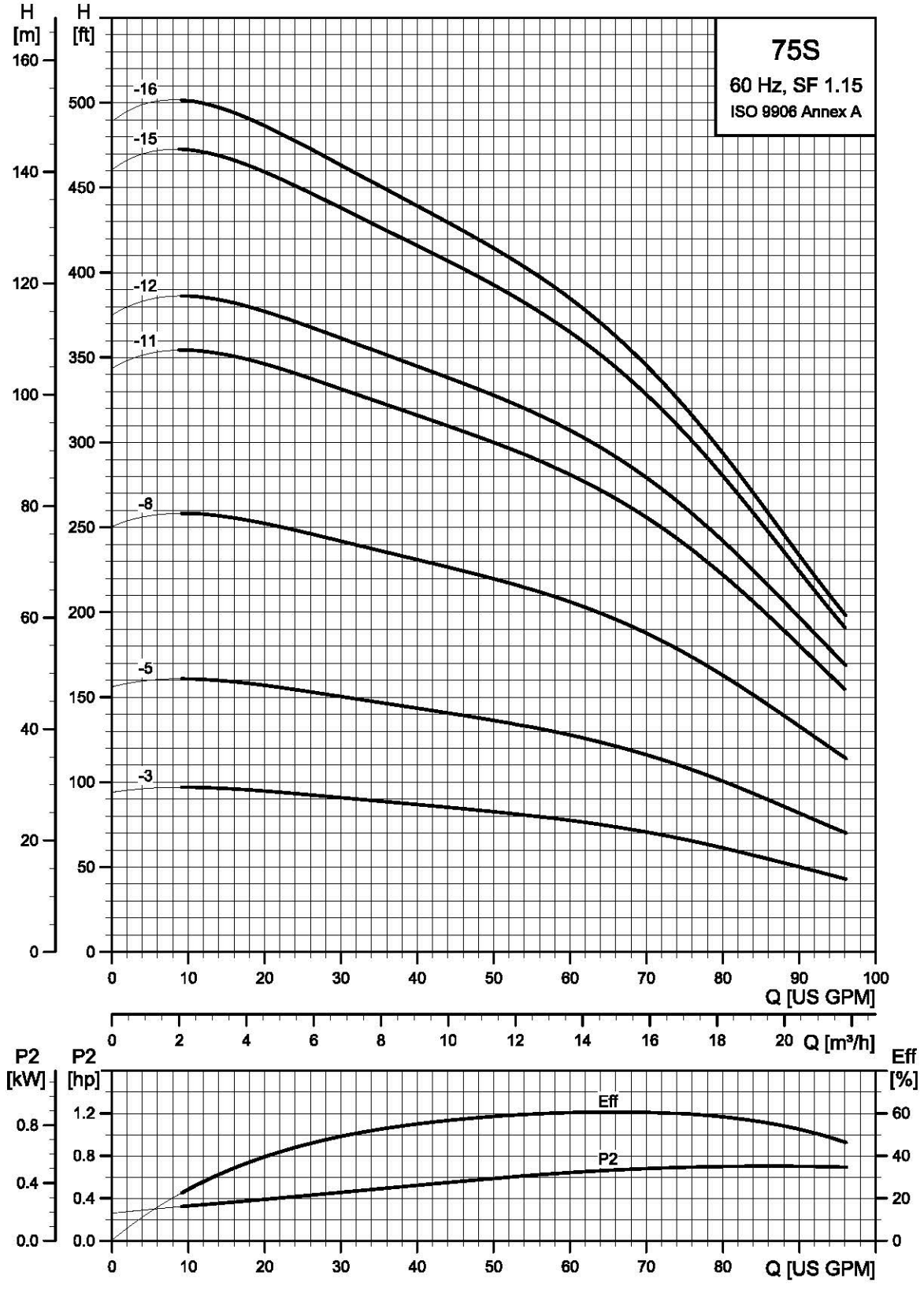
■ MS402 motor.
● MS4000 motor.
▲ MS6 motor.
∧ MMS6000 motor.
★ MMS8000 motor.
♦ Takes MS6 motor; not available as complete.
☼ Takes MMS6000 motor; not available as complete.
* Takes MMS8000 motor; not available as complete.
† Takes MMS10000 motor; not available as complete.

60S



E = Maximum diameter of pump including cable guard and motor.

75S (75 gpm)


75S
60 Hz, SF 1.15
ISO 9906 Annex A
H [m]
H [ft]
-16
-15
-12
-11
-8
-5
-3
Q [US GPM]
Q [m³/h]
P2 [kW]
P2 [hp]
Eff [%]
Eff
P2
Q [US GPM]
TM05 0234 0112

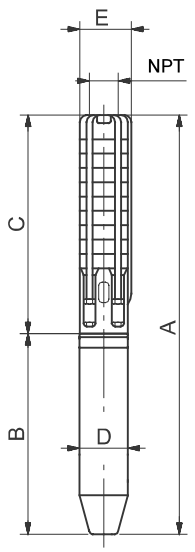
75S (75 gpm)

Pump model	Nom. head [ft]	Ph	Volts [V]	Motor [Hp]		Dimensions A [in (mm)]	B [in (mm)]	C [in (mm)]	D [in (mm)]	E [in (mm)]	Net weight (complete) [lb]
75S - Motor dia. 4 inch, 3 wire motor, 60 Hz, rated flow 75 gpm (2" NPT)											
75S20-3	68	1	230	2	●	34.45 (875)	19.49 (495)	14.97 (380)	3.74 (95)	3.97 (101)	36.9
		3	230	2	■	28.67 (728)	13.71 (348)	14.97 (380)	3.74 (95)	3.97 (101)	34.2
			460	2	■	28.67 (728)	13.71 (348)	14.97 (380)	3.74 (95)	3.97 (101)	34.2
75S30-5	114	1	230	3	●	42.68 (1084)	22.60 (574)	20.08 (510)	3.74 (95)	3.97 (101)	69.3
		3	230	3	●	38.08 (967)	18.00 (457)	20.08 (510)	3.74 (95)	3.97 (101)	57.6
			460	3	●	38.08 (967)	18.00 (457)	20.08 (510)	3.74 (95)	3.97 (101)	57.6
75S50-8	182	1	230	5	●	54.38 (1381)	26.62 (676)	27.76 (705)	3.74 (95)	3.97 (101)	87.3
		3	230	5	●	50.48 (1282)	22.72 (577)	27.76 (705)	3.74 (95)	3.97 (101)	74.7
			460	5	●	50.48 (1282)	22.72 (577)	27.76 (705)	3.74 (95)	3.97 (101)	74.7
75S75-12	273	3	230	7.5	●	64.65 (1642)	26.66 (677)	38.00 (965)	3.74 (95)	3.97 (101)	81.4
			460	7.5	●	64.65 (1642)	26.66 (677)	38.00 (965)	3.74 (95)	3.97 (101)	81.4
75S100-16	364	3	460	10	●	78.82 (2002)	30.60 (777)	48.23 (1225)	3.74 (95)	3.97 (101)	138.0
75S - Motor dia. 6 inch, 3 wire motor, 60 Hz, rated flow 75 gpm (2" NPT)											
75S75-11	250	3	230	7.5	▲	60.12 (1527)	22.25 (565)	37.88 (962)	5.63 (143)	5.43 (138)	130.5
			460	7.5	▲	60.12 (1527)	22.25 (565)	37.88 (962)	5.63 (143)	5.43 (138)	130.5
75S100-15	341	3	230	10	▲	70.16 (1782)	23.23 (590)	46.93 (1192)	5.63 (143)	5.43 (138)	175.5
			460	10	▲	70.16 (1782)	23.23 (590)	46.93 (1192)	5.63 (143)	5.43 (138)	175.5

Notes:
Control box is required for 3-wire, single-phase applications. Data does not include control box.

■ MS402 motor.
● MS4000 motor.
▲ MS6 motor.
∧ MMS6000 motor.
★ MMS8000 motor.
♦ Takes MS6 motor; not available as complete.
☼ Takes MMS6000 motor; not available as complete.
* Takes MMS8000 motor; not available as complete.
† Takes MMS10000 motor; not available as complete.

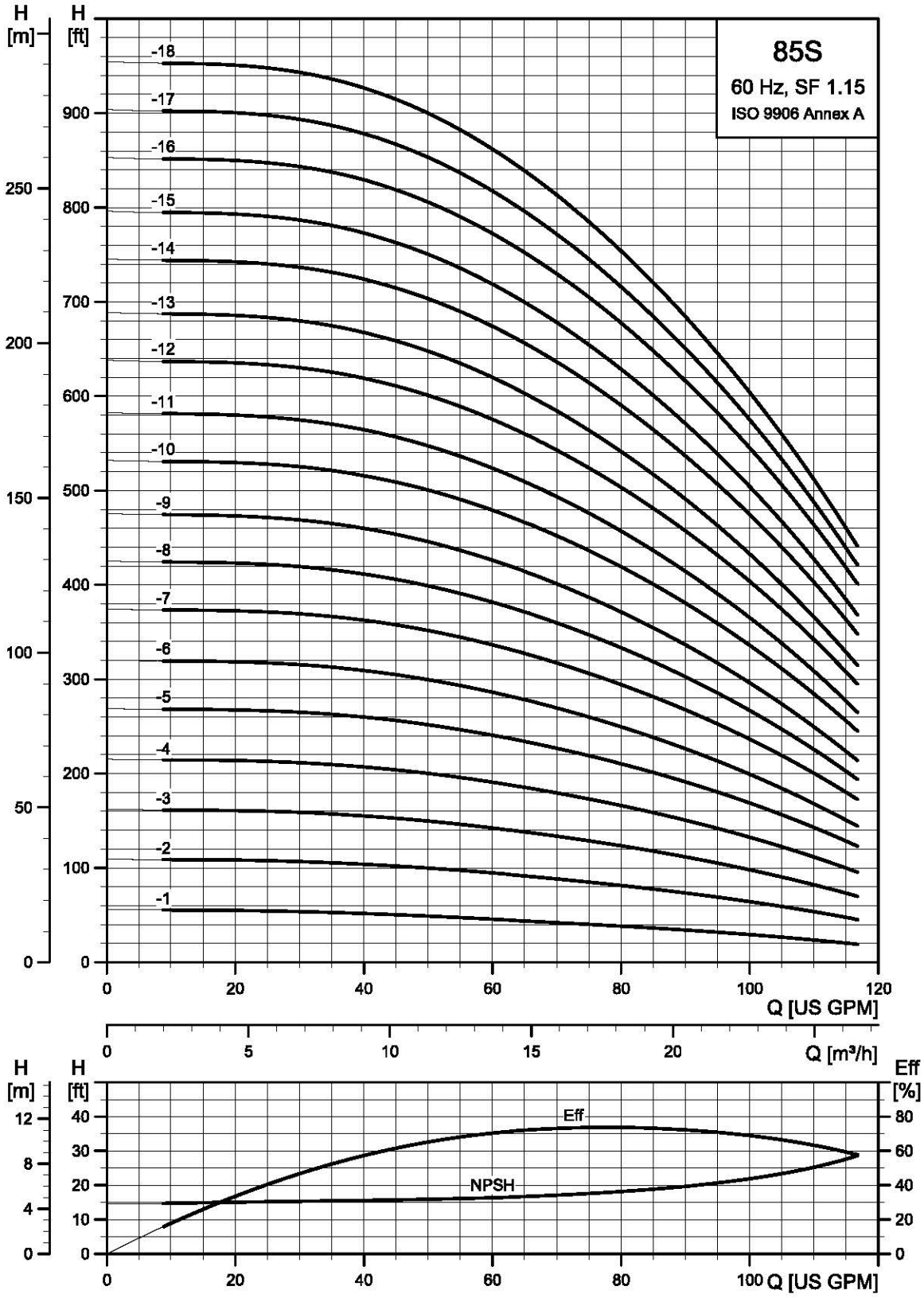
75S



TM05 2399 5011

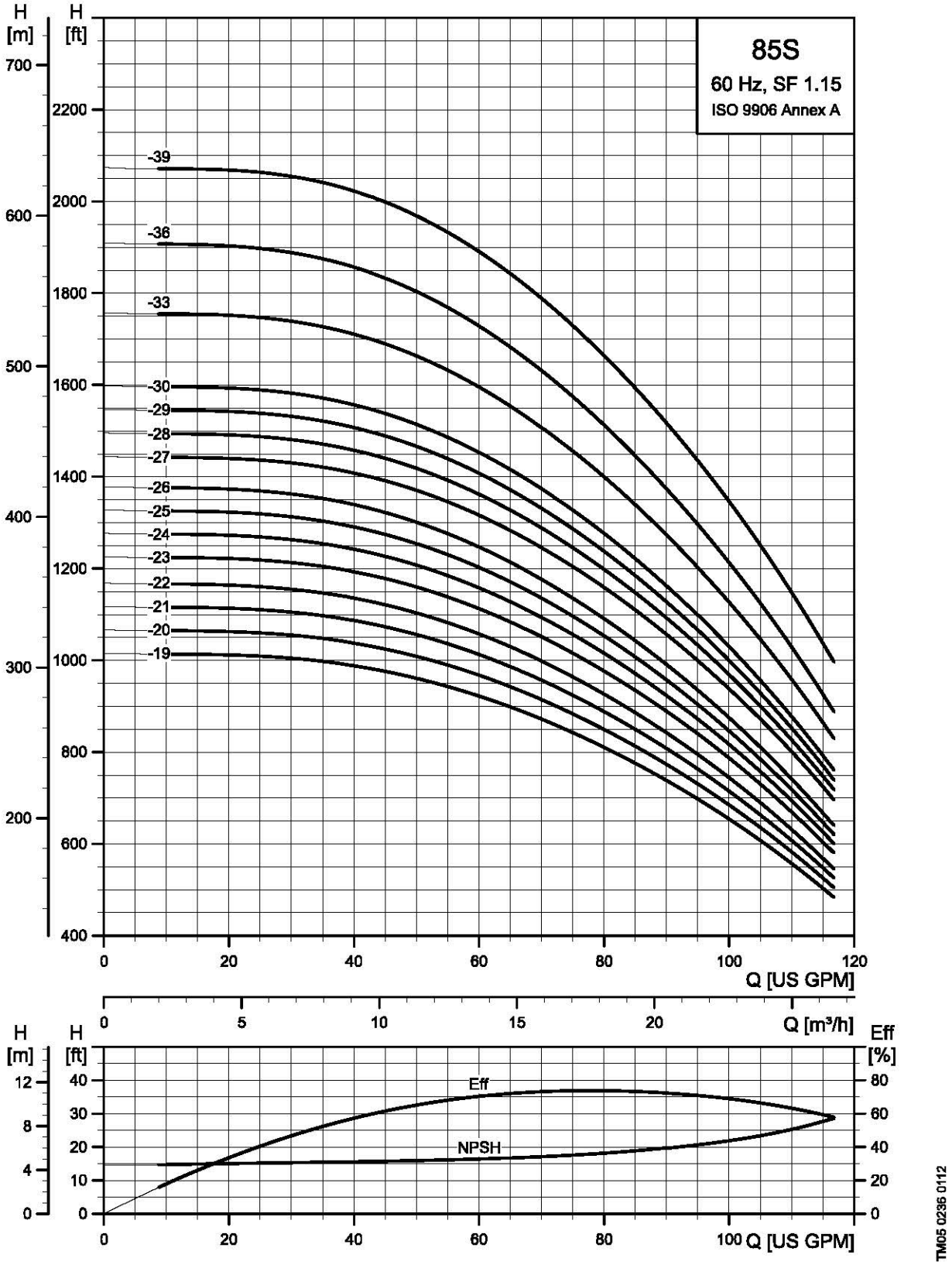
E = Maximum diameter of pump including cable guard and motor.

85S (85 gpm)

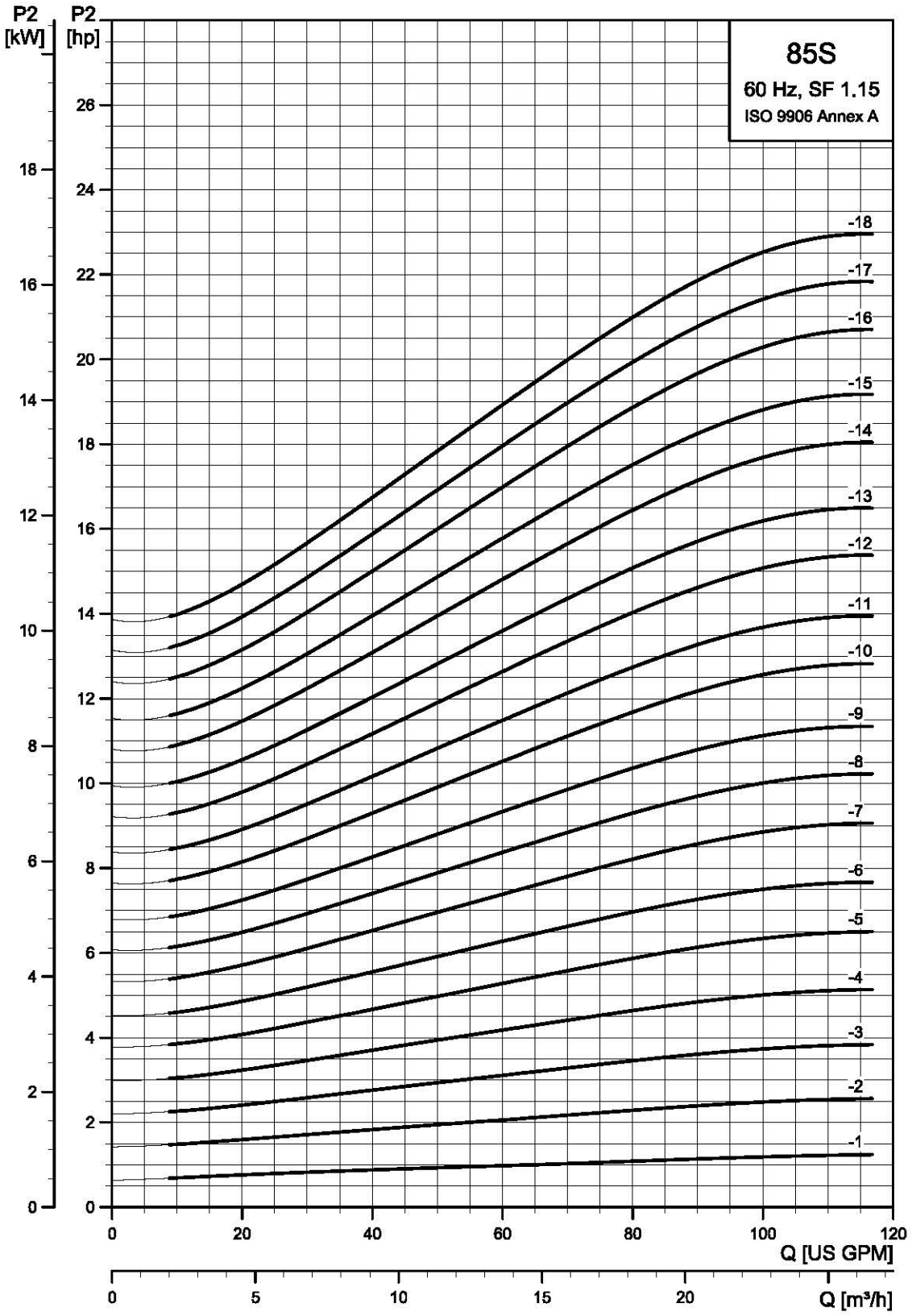


TM05 0235 0112

85S (85 gpm)

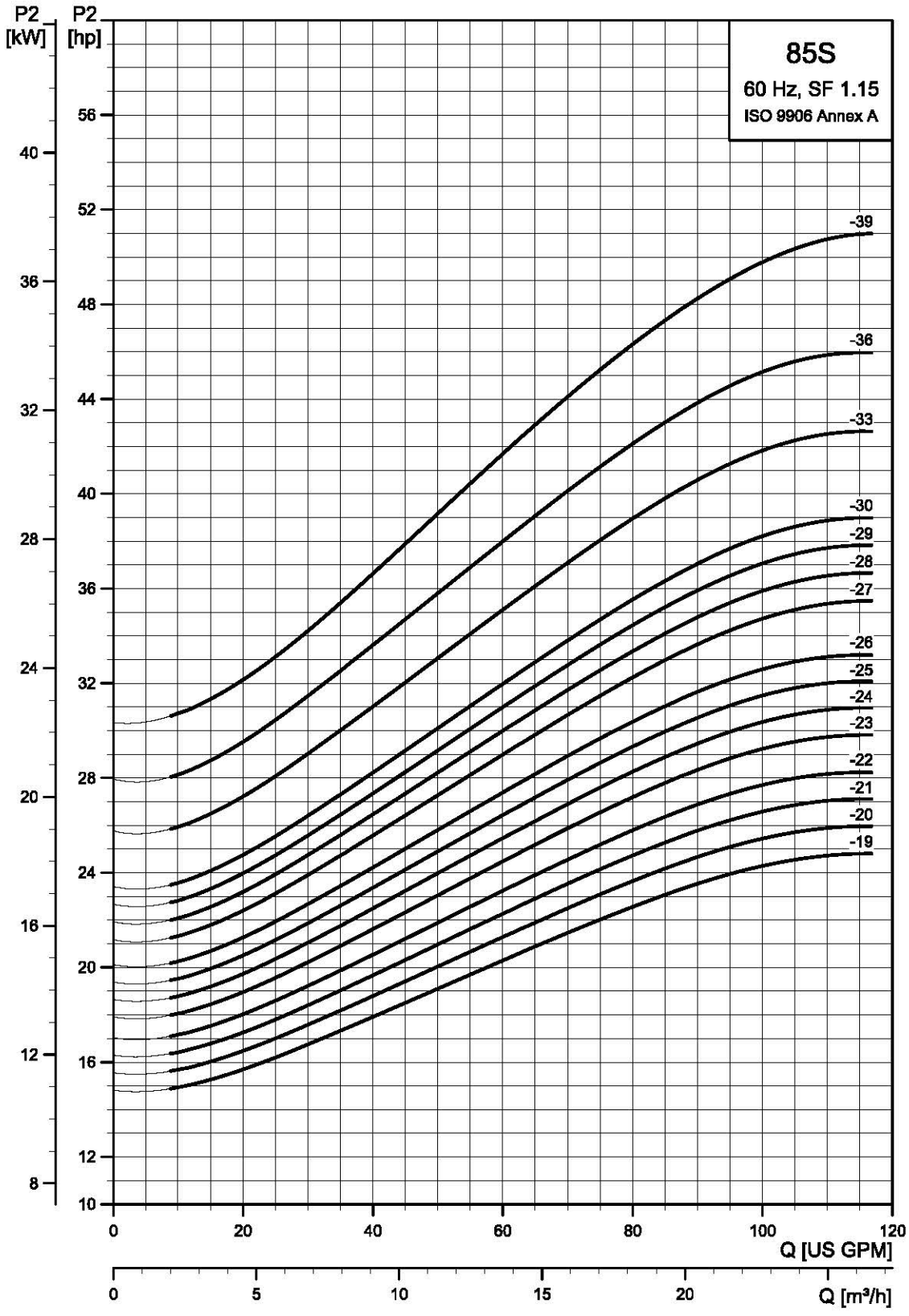

85S
60 Hz, SF 1.15
ISO 9906 Annex A
H [m]
H [ft]
-39
-36
-33
-30
-29
-28
-27
-26
-25
-24
-23
-22
-21
-20
-19
Q [US GPM]
Q [m³/h]
Eff [%]
Eff
NPSH
TM05 0236 0112

85S (85 gpm) pump power requirement (P2)



TM05 0237 0112

85S (85 gpm) pump power requirement (P2)

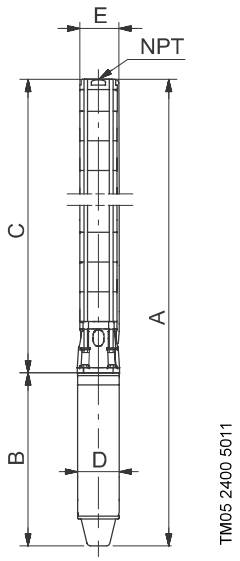


85S (85 gpm)

Pump model	Nom. head [ft]	Ph	Volts [V]	Motor [Hp]		Dimensions A [in (mm)]	B [in (mm)]	C [in (mm)]	D [in (mm)]	E [in (mm)]	Net weight (complete) [lb]
85S - Motor dia. 4 inch, 3 wire motor, 60 Hz, rated flow 85 gpm (3" NPT)											
85S15-1	35	1	230	1.5	■	27.60 (701)	15.24 (387)	12.36 (314)	3.74 (95)	5.16 (131)	29.7
		3	230	1.5	■	26.02 (661)	13.66 (347)	12.36 (314)	3.74 (95)	5.16 (131)	29.7
		3	460	1.5	■	26.02 (661)	13.66 (347)	12.36 (314)	3.74 (95)	5.16 (131)	29.7
85S30-2	74	1	230	3	●	32.69 (951)	22.72 (577)	14.72 (374)	3.74 (95)	5.16 (131)	55.8
		3	230	3	●	32.69 (830)	17.96 (456)	14.72 (374)	3.74 (95)	5.16 (131)	47.7
		3	460	3	●	32.69 (830)	17.96 (456)	14.72 (374)	3.74 (95)	5.16 (131)	47.7
85S50-3	114	1	230	5	●	43.78 (1112)	26.65 (677)	17.13 (435)	3.74 (95)	5.16 (131)	67.5
		3	230	5	●	39.80 (1011)	22.69 (576)	17.13 (435)	3.74 (95)	5.16 (131)	51.3
		3	460	5	●	39.80 (1011)	22.69 (576)	17.13 (435)	3.74 (95)	5.16 (131)	51.3
85S50-4	154	1	230	5	●	43.78 (1112)	26.65 (677)	17.13 (435)	3.74 (95)	5.16 (131)	69.3
		3	230	5	●	39.80 (1011)	22.69 (576)	17.13 (435)	3.74 (95)	5.16 (131)	61.2
		3	460	5	●	39.80 (1011)	22.69 (576)	17.13 (435)	3.74 (95)	5.16 (131)	61.2
85S75-5	194	3	230	7.5	●	48.50 (1232)	26.62 (676)	21.89 (556)	3.74 (95)	5.16 (131)	73.8
		3	460	7.5	●	48.50 (1232)	26.62 (676)	21.89 (556)	3.74 (95)	5.16 (131)	73.8
85S75-6	234	3	230	7.5	●	50.87 (1292)	26.62 (676)	24.25 (616)	3.74 (95)	5.16 (131)	85.5
		3	460	7.5	●	50.87 (1292)	26.62 (676)	24.25 (616)	3.74 (95)	5.16 (131)	76.5
85S100-7	274	3	460	10	●	57.21 (1453)	30.56 (776)	26.65 (677)	3.74 (95)	5.16 (131)	136.8
85S100-8	314	3	460	10	●	59.57 (1513)	30.56 (776)	29.02 (737)	3.74 (95)	5.16 (131)	138.6
85S100-9	353	3	460	10	●	61.98 (1574)	30.56 (776)	31.42 (798)	3.74 (95)	5.16 (131)	140.4

Pump model	Nom. head [ft]	Ph	Volts [V]	Motor [Hp]		Dimensions A [in (mm)]	B [in (mm)]	C [in (mm)]	D [in (mm)]	E [in (mm)]	Net weight (complete) [lb]
85S - Motor dia. 6 inch, 3 wire motor, 60 Hz, rated flow 85 gpm (3" NPT)											
85S75-5	194	3	230	7.5	▲	44.76 (1137)	22.52 (565)	22.52 (572)	5.63 (143)	5.59 (142)	98.1
		3	460	7.5	▲	44.76 (1137)	22.52 (565)	22.52 (572)	5.63 (143)	5.59 (142)	98.1
85S75-6	234	3	230	7.5	▲	47.12 (1197)	22.24 (565)	24.88 (632)	5.63 (143)	5.59 (142)	99.9
		3	460	7.5	▲	47.12 (1197)	22.24 (565)	24.88 (632)	5.63 (143)	5.59 (142)	99.9
85S100-7	274	3	230	10	▲	50.51 (1283)	23.23 (590)	27.28 (693)	5.63 (143)	5.59 (142)	103.5
		3	460	10	▲	50.51 (1283)	23.23 (590)	27.28 (693)	5.63 (143)	5.59 (142)	103.5
85S100-8	314	3	230	10	▲	52.87 (1343)	23.23 (590)	29.65 (753)	5.63 (143)	5.59 (142)	105.3
		3	460	10	▲	52.87 (1343)	23.23 (590)	29.65 (753)	5.63 (143)	5.59 (142)	105.3
85S100-9	353	3	230	10	▲	55.28 (1404)	23.23 (590)	32.05 (814)	5.63 (143)	5.60 (142)	108.0
		3	460	10	▲	55.28 (1404)	23.23 (590)	32.05 (814)	5.63 (143)	5.60 (142)	108.0
85S150-10	393	3	230	15	▲	62.29 (1582)	27.88 (708)	34.41 (874)	5.63 (143)	5.60 (142)	122.4
		3	460	15	▲	62.29 (1582)	27.88 (708)	34.41 (874)	5.63 (143)	5.60 (142)	122.4
85S150-11	433	3	230	15	▲	64.69 (1643)	27.88 (708)	36.82 (935)	5.63 (143)	5.60 (142)	126.0
		3	460	15	▲	64.69 (1643)	27.88 (708)	36.82 (935)	5.63 (143)	5.60 (142)	126.0
85S150-12	473	3	230	15	▲	67.05 (1703)	27.88 (708)	39.18 (995)	5.63 (143)	5.60 (142)	133.2
		3	460	15	▲	67.05 (1703)	27.88 (708)	39.18 (995)	5.63 (143)	5.60 (142)	133.2
85S150-13	513	3	230	15	▲	69.45 (1764)	27.88 (708)	41.58 (1056)	5.63 (143)	5.60 (142)	135.0
		3	460	15	▲	69.45 (1764)	27.88 (708)	41.58 (1056)	5.63 (143)	5.60 (142)	135.0

85S



E = Maximum diameter of pump including cable guard and motor.

Notes:
Control box is required for 3-wire, single-phase applications. Data does not include control box.

- ■ MS402 motor.
- ● MS4000 motor.
- ▲ MS6 motor.
- ∧ MMS6000 motor.
- ★ MMS8000 motor.
- ♦ Takes MS6 motor; not available as complete.
- ☼ Takes MMS6000 motor; not available as complete.
- * Takes MMS8000 motor; not available as complete.
- † Takes MMS10000 motor; not available as complete.

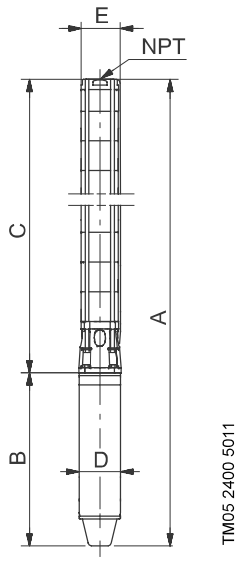
85S (85 gpm)

Pump model	Nom. head [ft]	Ph	Volts [V]	Motor [Hp]		Dimensions A [in (mm)]	B [in (mm)]	C [in (mm)]	D [in (mm)]	E [in (mm)]	Net weight (complete) [lb]
85S - Motor dia. 6 inch, 3 wire motor, 60 Hz, rated flow 85 gpm (3" NPT)											
85S200-14	533	3	230	20	▲	74.77 (1899)	30.83 (783)	43.94 (1116)	5.63 (143)	5.60 (142)	143.1
		3	460	20	▲	74.77 (1899)	30.83 (783)	43.94 (1116)	5.63 (143)	5.60 (142)	143.1
85S200-15	593	3	230	20	▲	77.17 (1960)	30.83 (783)	46.34 (1177)	5.63 (143)	5.60 (142)	147.6
		3	460	20	▲	77.17 (1960)	30.83 (783)	46.34 (1177)	5.63 (143)	5.60 (142)	147.6
85S200-16	633	3	230	20	▲	79.53 (2020)	30.83 (783)	48.71 (1237)	5.63 (143)	5.60 (142)	157.5
		3	460	20	▲	79.53 (2020)	30.83 (783)	48.71 (1237)	5.63 (143)	5.60 (142)	157.5
85S200-17	672	3	230	20	▲	81.93 (2081)	30.83 (783)	51.11 (1298)	5.63 (143)	5.60 (142)	160.2
		3	460	20	▲	81.93 (2081)	30.83 (783)	51.11 (1298)	5.63 (143)	5.60 (142)	160.2
85S200-18	712	3	230	20	▲	84.30 (2141)	30.83 (783)	53.47 (1358)	5.63 (143)	5.60 (142)	161.1
		3	460	20	▲	84.30 (2141)	30.83 (783)	53.47 (1358)	5.63 (143)	5.60 (142)	179.0
85S250-19	752	3	230	25	▲	88.86 (2257)	33.00 (838)	55.87 (1419)	5.63 (143)	5.60 (142)	191.7
		3	460	25	▲	88.86 (2257)	33.00 (838)	55.87 (1419)	5.63 (143)	5.60 (142)	191.7
85S250-20	792	3	230	25	▲	91.86 (2333)	33.00 (838)	58.86 (1495)	5.63 (143)	5.60 (142)	195.3
		3	460	25	▲	91.86 (2333)	33.00 (838)	58.86 (1495)	5.63 (143)	5.60 (142)	195.3
85S250-21	832	3	230	25	▲	94.26 (2394)	33.00 (838)	61.26 (1556)	5.63 (143)	5.60 (142)	198.0
		3	460	25	▲	94.26 (2394)	33.00 (838)	61.26 (1556)	5.63 (143)	5.60 (142)	198.0
85S250-22	872	3	230	25	▲	96.62 (2454)	33.00 (838)	63.63 (1616)	5.63 (143)	5.60 (142)	199.8
		3	460	25	▲	96.62 (2454)	33.00 (838)	63.63 (1616)	5.63 (143)	5.60 (142)	199.8
85S300-23	912	3	230	30	▲	101.54 (2579)	35.56 (903)	65.99 (1676)	5.63 (143)	5.60 (142)	199.8
		3	460	30	▲	101.54 (2579)	35.56 (903)	65.99 (1676)	5.63 (143)	5.60 (142)	199.8
85S300-24	952	3	230	30	▲	103.94 (2640)	35.56 (903)	68.39 (1737)	5.63 (143)	5.60 (142)	216.0
		3	460	30	▲	103.94 (2640)	35.56 (903)	68.39 (1737)	5.63 (143)	5.60 (142)	216.0
85S300-25	991	3	230	30	▲	106.34 (2701)	35.56 (903)	70.79 (1798)	5.63 (143)	5.60 (142)	219.6
		3	460	30	▲	106.34 (2701)	35.56 (903)	70.79 (1798)	5.63 (143)	5.60 (142)	219.6
85S300-26	1031	3	230	30	▲	108.71 (2761)	35.56 (903)	73.15 (1858)	5.63 (143)	5.60 (142)	221.4
		3	460	30	▲	108.71 (2761)	35.56 (903)	73.15 (1858)	5.63 (143)	5.60 (142)	221.4
85S300-27	1071	3	230	30	▲	111.11 (2822)	35.56 (903)	75.56 (1919)	5.63 (143)	5.60 (142)	234.9
		3	460	30	▲	111.11 (2822)	35.56 (903)	75.56 (1919)	5.63 (143)	5.60 (142)	234.9
85S400-28	1111	3	460	40	▲	118.19 (3002)	40.28 (1023)	77.92 (1979)	5.63 (143)	5.60 (142)	246.6
85S400-29	1151	3	460	40	▲	120.6 (3063)	40.28 (1023)	80.32 (2040)	5.63 (143)	5.60 (142)	248.4
85S400-30	1191	3	460	40	▲	122.96 (3123)	40.28 (1023)	82.68 (2100)	5.63 (143)	5.60 (142)	270.0
85S400-33DS	1310	3	460	40	▲	139.22 (3536)	40.28 (1023)	98.94 (2513)	5.63 (143)	6.90 (176)	515.5
85S400-36DS	1430	3	460	40	▲	146.34 (3717)	40.28 (1023)	106.07 (2694)	5.63 (143)	6.90 (176)	454.8
85S500-39DS	1510	3	460	50	▲	169.26 (4299)	56.03 (1423)	113.23 (2876)	5.63 (143)	6.90 (176)	469.0
85S - Motor dia. 8 inch, 3 wire motor, 60 Hz, rated flow 85 gpm (3" NPT)											
85S400-33DS	1310	3	460	40	★	140.87 (3578)	43.71 (1110)	97.17 (2468)	7.56 (192)	7.56 (192)	652.7
85S400-36DS	1310	3	460	40	★	147.96 (3758)	43.71 (1110)	104.26 (2648)	7.56 (192)	7.56 (192)	592.0
85S400-39DS	1510	3	460	50	★	155.04 (3938)	43.71 (1110)	111.34 (2828)	7.56 (192)	7.56 (192)	537.2

Notes:
Control box is required for 3-wire, single-phase applications. Data does not include control box.
DS designation = Built into sleeve, 3" NPT, 8" minimum well diameter.

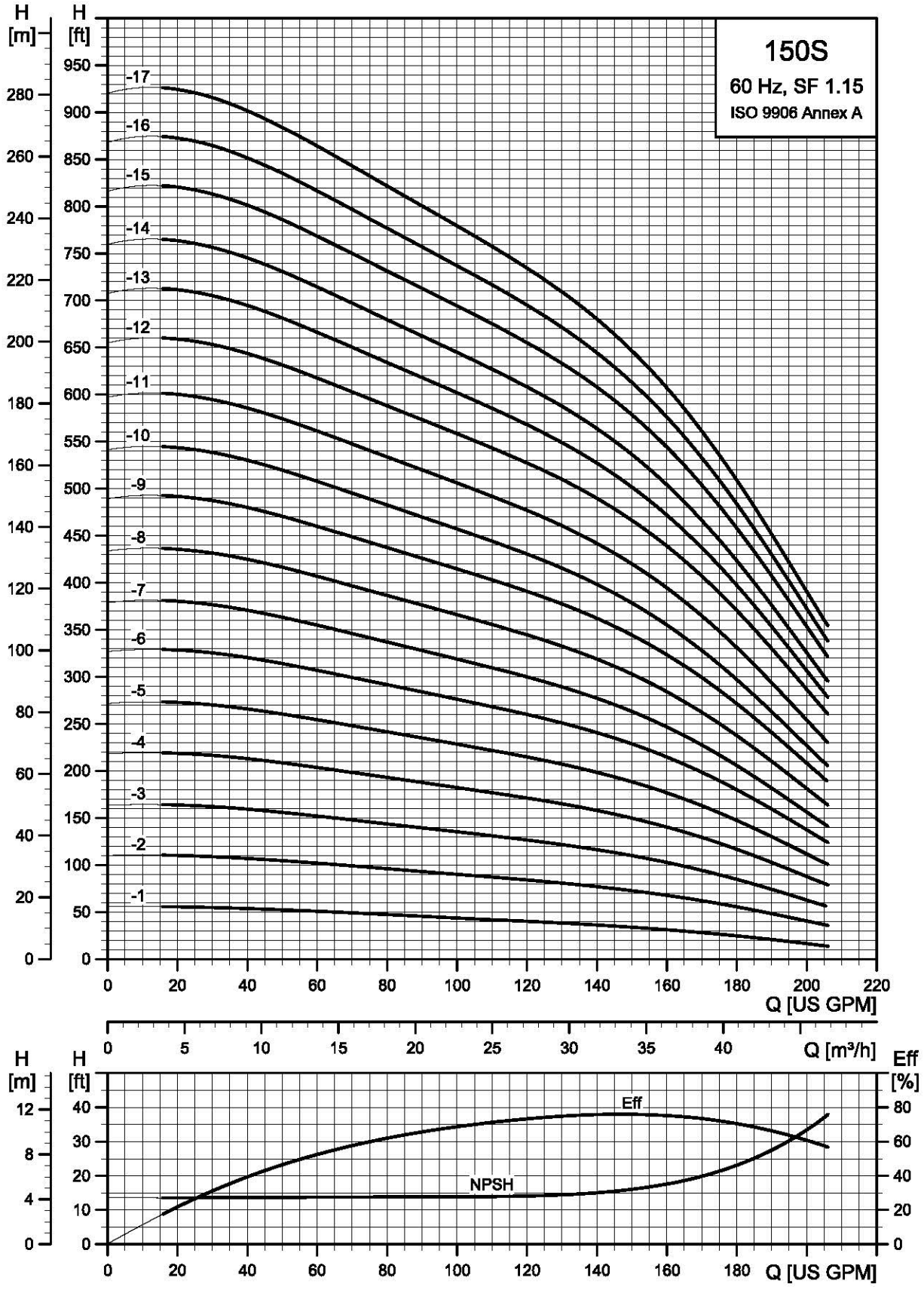
- ■ MS402 motor.
- ● MS4000 motor.
- ▲ MS6 motor.
- ∧ MMS6000 motor.
- ★ MMS8000 motor.
- ♦ Takes MS6 motor; not available as complete.
- ☼ Takes MMS6000 motor; not available as complete.
- * Takes MMS8000 motor; not available as complete.
- † Takes MMS10000 motor; not available as complete.

85S

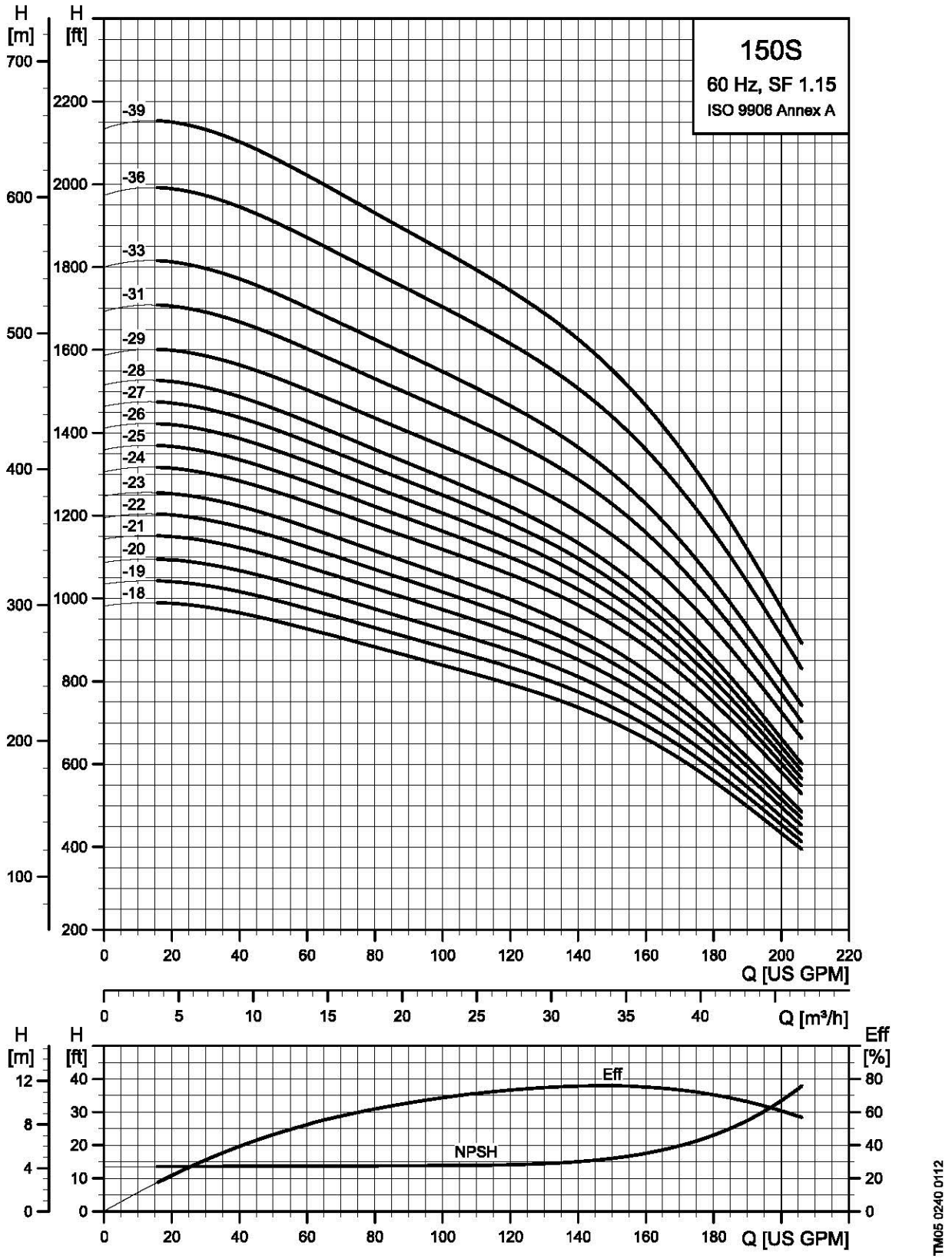


E = Maximum diameter of pump including cable guard and motor.

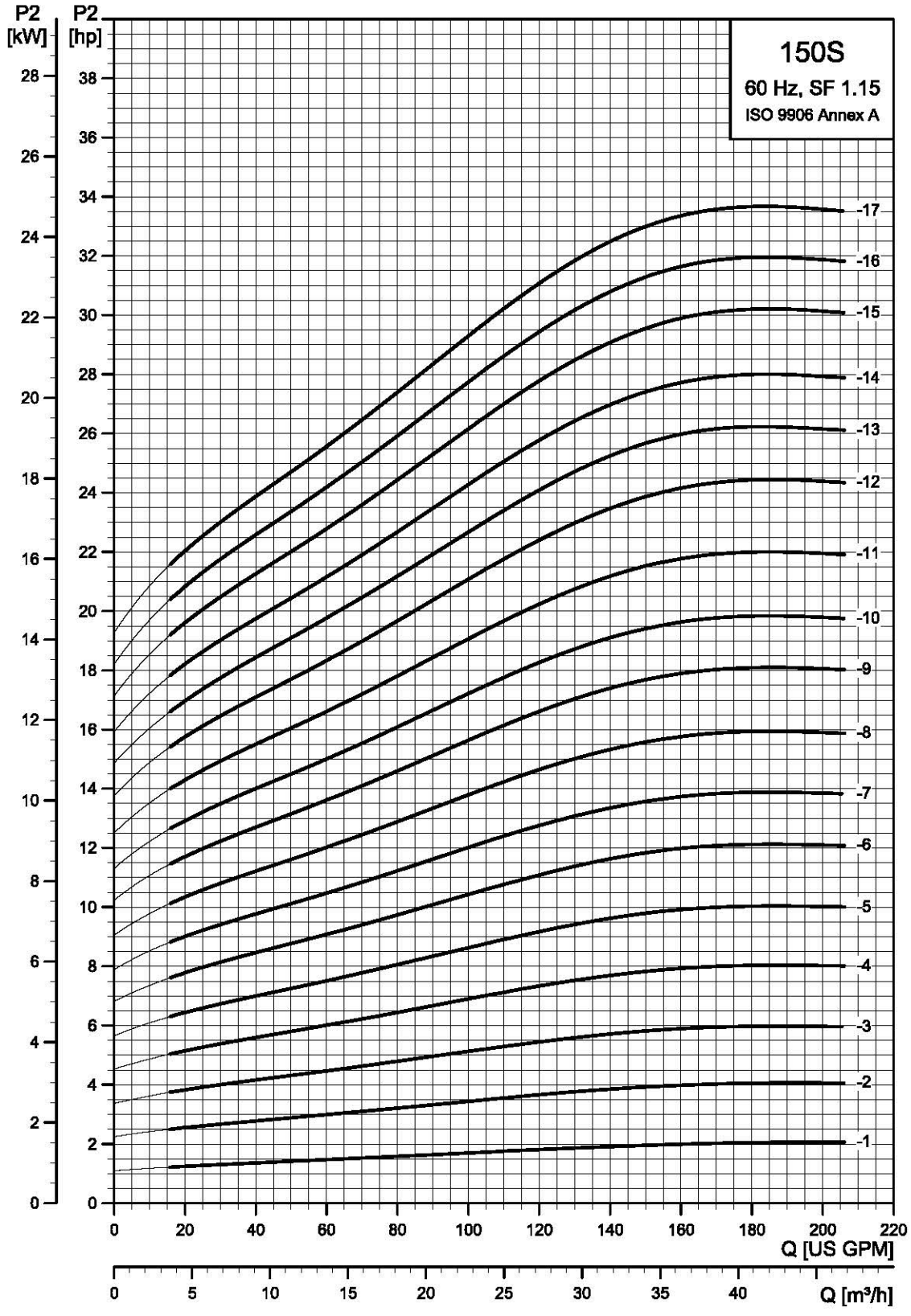
150S (150 gpm)


150S
60 Hz, SF 1.15
ISO 9906 Annex A
H [m]
H [ft]
-17
-16
-15
-14
-13
-12
-11
-10
-9
-8
-7
-6
-5
-4
-3
-2
-1
Q [US GPM]
Q [m³/h]
Eff [%]
Eff
NPSH
TM05 0239 0112

150S (150 gpm)

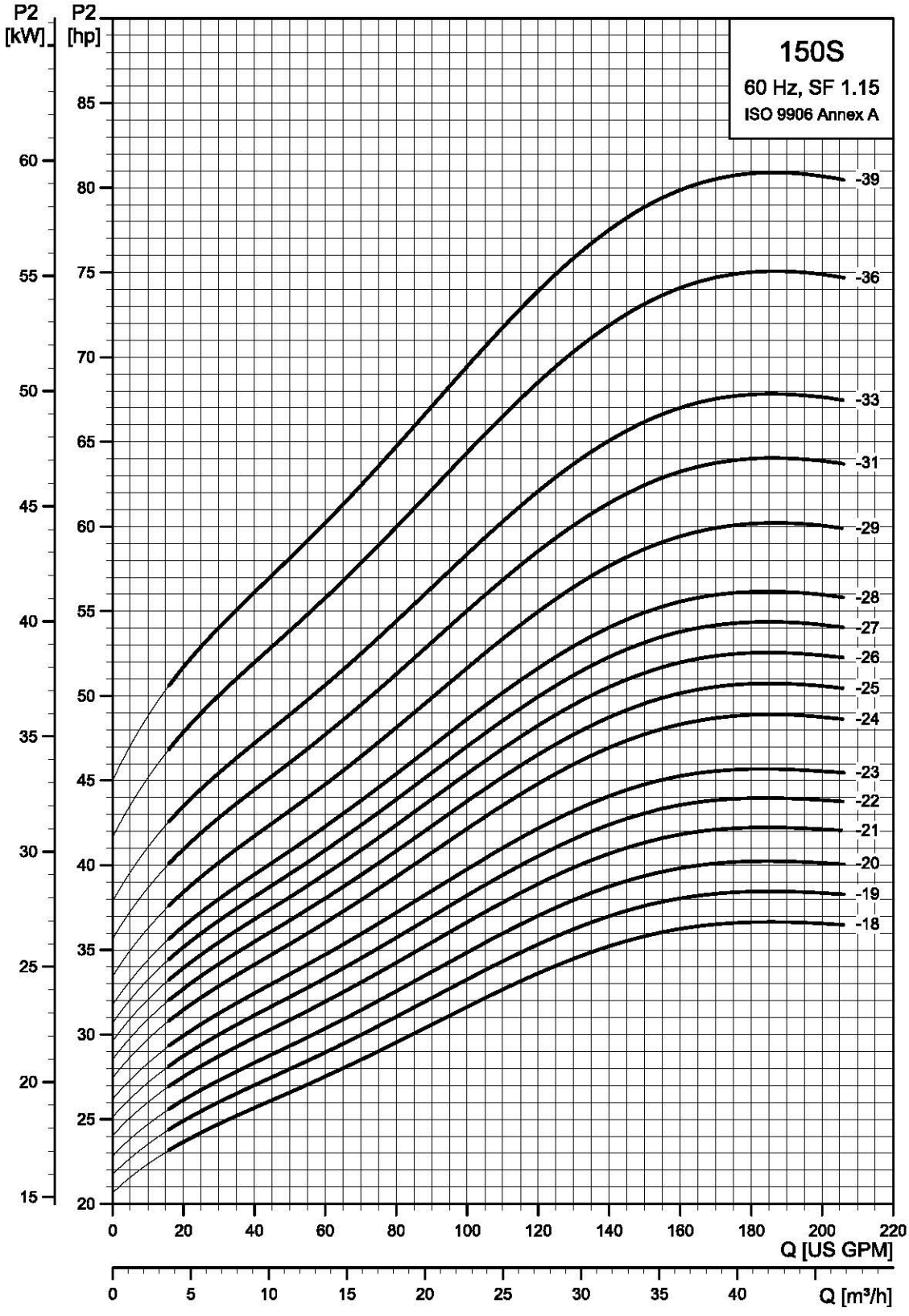

150S
60 Hz, SF 1.15
ISO 9906 Annex A
H [m]
H [ft]
-39
-36
-33
-31
-29
-28
-27
-26
-25
-24
-23
-22
-21
-20
-19
-18
Q [US GPM]
Q [m³/h]
H [m]
H [ft]
Eff [%]
Eff
NPSH
Q [US GPM]
TM05 0240 0112

150S (150 gpm) pump power requirement (P2)



TM05 0241 0112

150S (150 gpm) pump power requirement (P2)

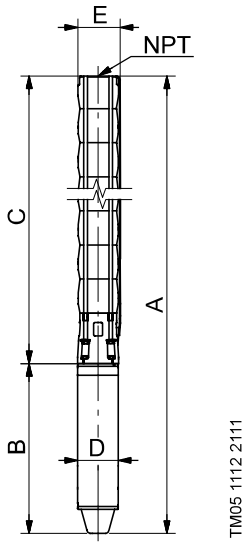


TM05 0242 0112

150S (150 gpm)

Pump model	Nom. head [ft]	Ph	Volts [V]	Motor [Hp]		Dimensions A [in (mm)]	B [in (mm)]	C [in (mm)]	D [in (mm)]	E [in (mm)]	Net weight (complete) [lb]
150S - Motor dia. 4 inch, 3 wire motor, 60 Hz, rated flow 150 gpm (3" NPT)											
150S20-1	33	1	230	2	●	33.30 (846)	19.57 (497)	13.75 (349)	3.75 (95)	5.16 (131)	49.5
		3	230	2	■	28.98 (736)	15.23 (387)	13.75 (349)	3.75 (95)	5.16 (131)	45.0
		3	460	2	■	28.98 (736)	15.23 (387)	13.75 (349)	3.75 (95)	5.16 (131)	45.0
150S50-2	71	1	230	5	●	44.17 (1122)	26.65 (677)	17.52 (445)	3.75 (95)	5.16 (131)	67.5
		3	230	5	●	40.20 (1021)	22.69 (576)	17.52 (445)	3.75 (95)	5.16 (131)	42.3
		3	460	5	●	40.20 (1021)	22.69 (576)	17.52 (445)	3.75 (95)	5.16 (131)	42.3
150S75-3	108	3	230	7.5	●	47.91 (1217)	26.63 (676)	21.3 (541)	3.75 (95)	5.16 (131)	51.3
		3	460	7.5	●	47.91 (1217)	26.63 (676)	21.3 (541)	3.75 (95)	5.16 (131)	82.8
150S75-4	146	3	230	7.5	●	51.71 (1313)	26.63 (676)	25.08 (637)	3.75 (95)	5.16 (131)	85.5
		3	460	7.5	●	51.71 (1313)	26.63 (676)	25.08 (637)	3.75 (95)	5.16 (131)	85.5
150S100-5	184	3	460	10	●	59.42 (1509)	30.56 (776)	28.86 (733)	3.75 (95)	5.16 (131)	135.9
150S - Motor dia. 6 inch, 3 wire motor, 60 Hz, rated flow 150 gpm (3" NPT)											
150S75-4	146	3	230	7.5	▲	47.96 (1218)	22.25 (565)	25.71 (653)	5.63 (143)	5.60 (142)	99.9
		3	460	7.5	▲	47.96 (1218)	22.25 (565)	25.71 (653)	5.63 (143)	5.60 (142)	99.9
150S100-5	184	3	230	10	▲	52.72 (1339)	23.23 (590)	29.49 (749)	5.63 (143)	5.60 (142)	73.8
		3	460	10	▲	52.72 (1339)	23.23 (590)	29.49 (749)	5.63 (143)	5.60 (142)	73.8
150S150-6	222	3	230	15	▲	61.15 (1553)	27.88 (708)	33.27 (845)	5.63 (143)	5.60 (142)	119.7
		3	460	15	▲	61.15 (1553)	27.88 (708)	33.27 (845)	5.63 (143)	5.60 (142)	119.7
150S150-7	260	3	230	15	▲	64.93 (1649)	27.88 (708)	37.05 (941)	5.63 (143)	5.60 (142)	127.8
		3	460	15	▲	64.93 (1649)	27.88 (708)	37.05 (941)	5.63 (143)	5.60 (142)	127.8
150S150-8	297	3	230	15	▲	68.71 (1745)	27.88 (708)	40.83 (1037)	5.63 (143)	5.60 (142)	137.7
		3	460	15	▲	68.71 (1745)	27.88 (708)	40.83 (1037)	5.63 (143)	5.60 (142)	137.7
150S200-9	335	3	230	20	▲	75.44 (1916)	30.83 (783)	44.61 (1133)	5.63 (143)	5.60 (142)	141.3
		3	460	20	▲	75.44 (1916)	30.83 (783)	44.61 (1133)	5.63 (143)	5.60 (142)	141.3
150S200-10	373	3	230	20	▲	79.22 (2012)	30.83 (783)	48.39 (1229)	5.63 (143)	5.60 (142)	151.2
		3	460	20	▲	79.22 (2012)	30.83 (783)	48.39 (1229)	5.63 (143)	5.60 (142)	151.2
150S200-11	411	3	230	20	▲	83.00 (2108)	30.83 (783)	52.17 (1325)	5.63 (143)	5.60 (142)	166.5
		3	460	20	▲	83.00 (2108)	30.83 (783)	52.17 (1325)	5.63 (143)	5.60 (142)	166.5
150S250-12	448	3	230	25	▲	88.86 (2257)	32.92 (836)	55.95 (1421)	5.63 (143)	5.60 (142)	188.1
		3	460	25	▲	88.86 (2257)	32.92 (836)	55.95 (1421)	5.63 (143)	5.60 (142)	188.1
150S250-13	486	3	230	25	▲	92.64 (2353)	32.92 (836)	59.73 (1517)	5.63 (143)	5.60 (142)	201.6
		3	460	25	▲	92.64 (2353)	32.92 (836)	59.73 (1517)	5.63 (143)	5.60 (142)	201.6
150S250-14	524	3	230	25	▲	96.42 (2449)	32.92 (836)	63.51 (1613)	5.63 (143)	5.60 (142)	206.1
		3	460	25	▲	96.42 (2449)	32.92 (836)	63.51 (1613)	5.63 (143)	5.60 (142)	206.1

150S



TM05 1112 2111

E = Maximum diameter of pump including cable guard and motor.

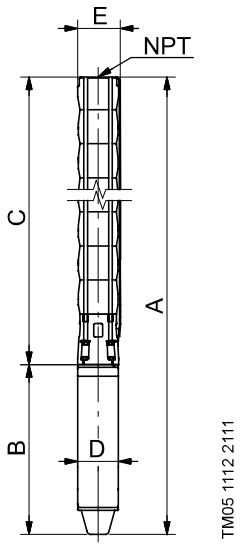
Notes:
Control box is required for 3-wire, single-phase applications. Data does not include control box.

- ■ MS402 motor.
- ● MS4000 motor.
- ▲ MS6 motor.
- ∧ MMS6000 motor.
- ★ MMS8000 motor.
- ♦ Takes MS6 motor; not available as complete.
- ☼ Takes MMS6000 motor; not available as complete.
- * Takes MMS8000 motor; not available as complete.
- † Takes MMS10000 motor; not available as complete.

150S (150 gpm)

Pump model	Nom. head [ft]	Ph	Volts [V]	Motor [Hp]		Dimensions A [in (mm)]	B [in (mm)]	C [in (mm)]	D [in (mm)]	E [in (mm)]	Net weight (complete) [lb]
150S - Motor dia. 6 inch, 3 wire motor, 60 Hz, rated flow 150 gpm (3" NPT)											
150S300-15	562	3	230	30	▲	102.84 (2612)	35.56 (903)	67.29 (1709)	5.63 (143)	5.60 (142)	209.7
		3	460	30	▲	102.84 (2612)	35.56 (903)	67.29 (1709)	5.63 (143)	5.60 (142)	209.7
150S300-16	600	3	230	30	▲	106.62 (2708)	35.56 (903)	71.07 (1805)	5.63 (143)	5.60 (142)	211.5
		3	460	30	▲	106.62 (2708)	35.56 (903)	71.07 (1805)	5.63 (143)	5.60 (142)	211.5
150S300-17	637	3	230	30	▲	110.4 (2804)	35.56 (903)	74.85 (1901)	5.63 (143)	5.60 (142)	216.0
		3	460	30	▲	110.4 (2804)	35.56 (903)	74.85 (1901)	5.63 (143)	5.60 (142)	246.6
150S400-18	675	3	460	40	▲	118.9 (3020)	40.28 (1023)	78.63 (1997)	5.63 (143)	5.60 (142)	246.6
150S400-19	713	3	460	40	▲	122.68 (3116)	40.28 (1023)	82.41 (2093)	5.63 (143)	5.60 (142)	248.4
150S400-20	751	3	460	40	▲	126.46 (3212)	40.28 (1023)	86.19 (2189)	5.63 (143)	5.60 (142)	291.0
150S400-21	789	3	460	40	▲	130.24 (3308)	40.28 (1023)	89.97 (2285)	5.63 (143)	5.67 (144)	271.8
150S400-22	826	3	460	40	▲	134.02 (3404)	40.28 (1023)	93.75 (2381)	5.63 (143)	5.67 (144)	305.9
150S400-23	864	3	460	40	▲	137.8 (3500)	40.28 (1023)	97.52 (2477)	5.63 (143)	5.67 (144)	277.2
150S500-24	902	3	460	50	☼	157.41 (3998)	56.11 (1425)	101.3 (2573)	5.67 (144)	5.60 (142)	411.8
150S500-25	940	3	460	50	☼	161.19 (4094)	56.11 (1425)	105.08 (2669)	5.67 (144)	5.60 (142)	419.0
150S500-26	977	3	460	50	☼	164.97 (4190)	56.11 (1425)	108.86 (2765)	5.67 (144)	5.60 (142)	426.2
150S500-27	1015	3	460	50	☼	168.75 (4286)	56.11 (1425)	112.64 (2861)	5.67 (144)	5.60 (142)	433.4
150S500-28	1053	3	460	50	☼	172.52 (4382)	56.11 (1425)	116.42 (2957)	5.67 (144)	5.60 (142)	440.6
150S600-29DS	1091	3	460	60	-	—	—	129.05 (3278)	—	7.10 (181)	—
150S600-31DS	1166	3	460	60	-	—	—	136.61 (3470)	—	7.10 (181)	—
150S600-33DS	1242	3	460	60	-	—	—	144.17 (3662)	—	7.10 (181)	—
150S - Motor dia. 8 inch, 3 wire motor, 60 Hz, rated flow 150 gpm (3" NPT)											
150S500-24	902	3	460	50	*	148.12 (3762)	45.67 (1160)	102.45 (2602)	7.56 (192)	7.56 (192)	484.5
150S500-25	940	3	460	50	*	151.89 (3858)	45.67 (1160)	106.23 (2698)	7.56 (192)	7.56 (192)	491.7
150S500-26	977	3	460	50	*	155.67 (3954)	45.67 (1160)	110.00 (2794)	7.56 (192)	7.56 (192)	498.9
150S500-27	1015	3	460	50	*	159.45 (4050)	45.67 (1160)	113.78 (2890)	7.56 (192)	7.56 (192)	506.1
150S500-28	1053	3	460	50	*	163.23 (4146)	45.67 (1160)	117.56 (2986)	7.56 (192)	7.56 (192)	513.3
150S600-29DS	1091	3	460	60	*	177.92 (4519)	50.00 (1270)	127.92 (3249)	7.56 (192)	7.56 (192)	612.7
150S600-31DS	1166	3	460	60	*	185.48 (4711)	50.00 (1270)	135.48 (3441)	7.56 (192)	7.56 (192)	623.7
150S600-33DS	1242	3	460	60	*	193.04 (4903)	50.00 (1270)	143.04 (3633)	7.56 (192)	7.56 (192)	639.1
150S750-36DS	1355	3	460	75	*	207.52 (5271)	53.15 (1350)	154.38 (3921)	7.56 (192)	7.56 (192)	689.2
150S750-39DS	1469	3	460	75	*	218.86 (5559)	53.15 (1350)	165.71 (4209)	7.56 (192)	7.56 (192)	704.6

150S



E = Maximum diameter of pump including cable guard and motor.

Notes:
Control box is required for 3-wire, single-phase applications. Data does not include control box.
DS designation = Built into sleeve, 3" NPT, 8" minimum well diameter.

- ■ MS402 motor.
- ● MS4000 motor.
- ▲ MS6 motor.
- ∧ MMS6000 motor.
- ★ MMS8000 motor.
- ♦ Takes MS6 motor; not available as complete.
- ☼ Takes MMS6000 motor; not available as complete.
- * Takes MMS8000 motor; not available as complete.
- † Takes MMS10000 motor; not available as complete.

APPENDIX B
INFLUENT AND EFFLUENT PIPING RECORD DRAWINGS

Call before you Overhead
1-702-593-6111

Call before you Dig
1-800-227-2600

COLLECTION and TREATMENT FACILITY
INLET/OUTLET PIPELINES

APPROVALS

urt Seyler, P.E UTILITIES SERVICES MANAGER CITY OF HENDERSON	DATE
ichael Bouse DIRECTOR BUILDING AND SAFETY CITY OF HENDERSON	DATE
ohn E. Bortels P.E CITY TRAFFIC ENGINEER CITY OF HENDERSON	DATE
ames Madden FIRE MARSHAL CITY OF HENDERSON	DATE
urt Chandler, P.E FLOOD CONTROL COORDINATOR CITY OF HENDERSON	DATE
EVADA POWER COMPANY	DATE
OUTHWEST GAS CORPORATION	DATE
PRINT	DATE
OX COMMUNICATIONS OF LAS VEGAS, INC	DATE
OUTHERN NEVADA WATER SYSTEM	DATE
LARK COUNTY	DATE

KERR-McGEE CHEMICAL LLC

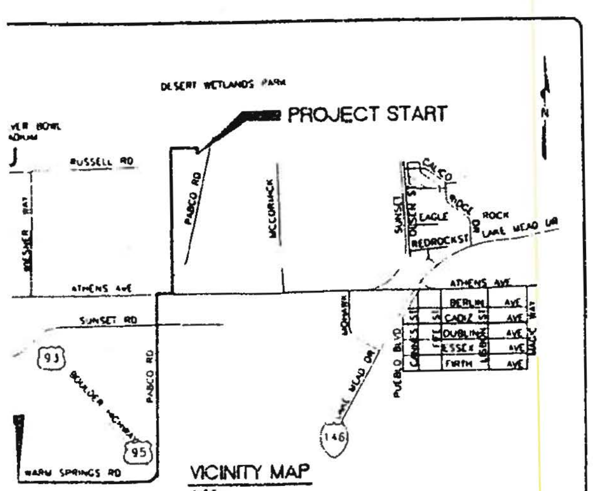
RECORD DRAWINGS
10-19-2001

MAY 2001

THIS SET OF IMPROVEMENT PLANS IS CERTIFIED TO CONFORM TO THE REQUIREMENTS OF THE TRAFFIC STUDY ACCEPTANCE LETTER		
N/A		
NAME	P.E. NO	DATE

CITY OF HENDERSON - APPROVAL

Ken Y. Koshiro, P.E
NEW DEVELOPMENT ENGINEER
CITY OF HENDERSON
DATE



VICINITY MAP
N.T.S.

ENGINEER

PBS&J INC
901 N. GREEN VALLEY PKWY, SUITE 100
HENDERSON, NEVADA 89014
CONTACT: JAMES TUCKER, P.E
(702) 263-7275

OWNER/DEVELOPER

CONTACT: EVERETTE SPORE
KERR-McGEE CHEMICAL LLC
8000 WEST LAKE MEAD DRIVE
HENDERSON, NEVADA 89015
(702) 651-2200

#3
7
13
14
15
18
19
20
21

"APPROVAL OF THESE PLANS BY THE CITY OF HENDERSON IS LIMITED TO THOSE IMPROVEMENTS CONSTRUCTED IN THE DEDICATED RIGHT-OF-WAY AND/OR DEDICATED EASEMENTS. THIS APPROVAL DOES NOT AUTHORIZE THE CONSTRUCTION OF ANY IMPROVEMENTS THAT DEVIATE FROM ADOPTED STANDARDS AND/OR SPECIFICATIONS EXCEPT THOSE SPECIFICALLY IDENTIFIED AS "DEVIATIONS FROM STANDARDS". THE ENGINEER SHALL RESOLVE ANY DEVIATION OTHER THAN THOSE LISTED IN "DEVIATIONS FROM STANDARDS" IN FAVOR OF THE UNIFORM STANDARDS DRAWINGS AND SPECIFICATIONS CLARK COUNTY AREA NEVADA"

SHEET INDEX

MONUMENTATION

OWNER IS RESPONSIBLE TO PROVIDE SURVEY MONUMENTATION AS SHOWN AND TO REPLACE ALL SURVEY MONUMENTATION DAMAGED, DISTURBED, DESTROYED, OR OBSCURED DURING CONSTRUCTION

BENCHMARK

CITY OF HENDERSON BENCH MARK NO 210 DATED 09/15/93
DESC. BRASS CAP IN CONCRETE, LOCATED 50'± EAST OF THE AC IN THE CENTER OF THE DOUBLE POWER POLE, 8'± NORTH EAST OF HIGHWAY 41 ON THE EAST SIDE OF HIGHWAY 93, 1000'± SOUTH OF PABCO ROAD.
ELEVATION IN METERS - 538.356 = 1766.26 FEET
C.O.H. NAVD '88
CONVERSION FACTOR METERS × 3937/1200 = U.S. FEET

BASIS OF BEARING

SOUTH 88°52'23" WEST BEING THE BEARING OF THE NORTH LINE OF THE NORTHWEST QUARTER (NW 1/4) OF SECTION 31, TOWNSHIP 21 SOUTH, RANGE 63 EAST, M.D.M., CLARK COUNTY, NEVADA, AS SHOWN ON THAT CERTAIN MAP ON FILE IN THE CLARK COUNTY RECORDER'S OFFICE IN FILE 101 OF SURVEYS, AT PAGE 24

PROFESSIONAL ENGINEER - STATE OF NEVADA
JAMES J. TUCKER
CIVIL

PBS&J

KERR-Mc GEE CHEMICAL LLC
P.O. BOX 55 HENDERSON, NEV 89009-7000

INLET/OUTLET PIPELINES
COLLECTION and TREATMENT FACILITY
COVER SHEET

RECORD DRAWINGS
APPROVED FOR CONSTRUCTION

PAPER SIZE	DRAWING NO	SHEET
A	G-001	1 OF

ABBREVIATIONS

PHALTIC CONCRETE
AD
MINUM OR ALUM
ERICAN NATIONAL STANDARDS INSTITUTE
SESSORS PARCEL NUMBER
TE
E VALVE ASSEMBLY
STANDARDS ASSOCIATION (NOW ANSI)
ERICAN SOCIETY FOR TESTING AND MATERIAL
ERICAN TELEGRAPH &TELEPHONE
VACUUM / AIR RELEASE VALVE ASSEMBLY
CURVE OR BACK OF CURB
CURB RETURN
DING
OR BENCH MARK
TOM
IN VERTICAL CURVE
TERFLY VALVE
ACITY
LE TELEVISION
CH BASIN
TER TO CENTER
RIFUGALLY CAST FIBERGLASS REINFORCED
COUNTY NEVADA
COUNTY PUBLIC WORKS
COUNTY REGIONAL FLOOD CONTROL DISTRICT
COUNTY SANITATION DISTRICT
TERLINE
NCE
STRUCTION JOINT
OF LAS VEGAS
AR
TROLLED LOW STRENGTH MATERIAL
ENT MORTAR LINED / COATED
ENT MORTAR LINED/
PE WRAPPED CEMENT MORTAR COATED
RUGATED METAL PIPE
CRETE MASONRY UNIT
EV PIPELINE COMPANY
OF NORTH LAS VEGAS
UMN
CRETE OR CONCENTRIC
TINUED, CONTINUOUS, CONTINUATION
TRACTOR
STRUCTION
POINT OR CATHODIC PROTECTION
TELEPHONE NEVADA
ODIC PROTECTION TEST STATION
ENS UTILITIES
DER
LE IRON PIPE
ETER
HARGE
VALVE
WING
ELECTRIC
CURVE
TRIC
CURB RETURN
FACE
ENT
TION
SED
OF PAVEMENT
MENT
VERTICAL CURVE
WAY
ING
SION JOINT
FLOOR
ED GRADE
HYDRANT

FIG	FIGURE
FIN	FINISHED
FL	FLOWLINE OR FLOOR
FLEX	FLEXIBLE
FLG	FLANGE
FLR	FLOOR
FO	FIBER OPTIC
G	GAS
GALV	GALVANIZED
GND	GROUND
GRD	GRADE OR GROUND
GR BRK	GRADE BREAK OR GRADE CHANGE
GRTG	GRATING
GV	GATE VALVE
HDPE	HIGH DENSITY POLYETHYLENE
HP	HIGH PRESSURE
HPI	HORIZONTAL POINT OF INTERSECTION
HMWPE	HIGH MOLECULAR WEIGHT POLYETHYLENE
HORIZ	HORIZONTAL
HWL	HIGH WATER LEVEL
HV	HORIZONTAL & VERTICAL CONTROL POINT
HYD	HYDRAULIC OR HYDRANT
ID	INSIDE DIAMETER
IN	INCH
INV	INVERT ELEVATION
IRR	IRRIGATION
KW	KW PIPELINE
LB	POUND
LG	LENGTH
LP	LIGHT POLE
LF	LINEAR FEET
LT	LEFT
LVVWD	LAS VEGAS VALLEY WATER DISTRICT
MAX	MAXIMUM
MFR	MANUFACTURER
MH	MANHOLE
MIN	MINIMUM OR MINUTE
MISC	MISCELLANEOUS
MJ	MECHANICAL JOINT
ML	MONUMENT LINE
MLCP	MORTAR LINED/COATED PIPE
MON	MONUMENT
MTH	MONTH
N	NORTH
NDOT	NEVADA DEPARTMENT OF TRANSPORTATION
NIC	NOT IN CONTRACT
NLVL	NORTH LAS VEGAS LATERAL
NO/#	NUMBER
NTS	NOT TO SCALE
NPC	NEVADA POWER COMPANY
OC	ON CENTER
OD	OUTSIDE DIAMETER
OH	OVERHEAD
ORIG	ORIGINAL
P&P	PLAN & PROFILE
P	PIPE OR PETROLEUM
PC	POINT OF CURVATURE, PRIME CABLE
PCC	POINT OF COMPOUND CURVATURE
PCP	PHOTO CONTROL POINT
PE	PERMANENT EASEMENT
PI	POINT OF INTERSECTION
PL	PLATE, PROPERTY LINE OR PLACE
POB	POINT OF BEGINNING
POT	POINT ON TANGENT
PP	PANEL POINT, POWER POLE OR POLYPROPYLENE
PR	PAIR
PRC	POINT OF REVERSE CURVE
PRESS	PRESSURE
PSI	POUNDS PER SQUARE INCH
PT	POINT OF TANGENT
PVC	POLYVINYL CHLORIDE
PUE	PATENT UTILITY EASEMENT
PVMT	PAVEMENT
QTY	QUANTITY

R	RADIUS, RISER, RETURN OR RATE OF SLOPE
RC	REINFORCED CONCRETE
RCP	REINFORCED CONCRETE PIPE
RED	REDUCER OR REDUCING
REF	REFERENCE OR REFER
REIN	REINFORCE OR REINFORCED
RTC	REGIONAL TRANSPORTATION COMMISSION
REQD	REQUIRED
REQ'D	REQUIRED
REV	REVISION
RHH	HEAT RESISTANT RUBBER
RLS	REGISTERED LAND SURVEYOR
RR	RAILROAD
RSG	RESILIENT SEATED GATE
RT	RIGHT
ROW, R/W	RIGHT OF WAY
S	SOUTH OR SLOPE
SC	SCALE
SCD	SCREWED
SCH	SCHEDULE
SCLV	SUPER CHANNELS OF LAS VEGAS
SD	STORM DRAIN
SEC	SECTION
SHT	SHEET OR SHELF
SIM	SIMILAR
SL	SLUDGE OR SLOPE
SMH	SEWER MANHOLE
SNWA	SOUTHERN NEVADA WATER AUTHORITY
SNWS	SOUTHERN NEVADA WATER SYSTEM
SPEC	SPECIFICATION
SPT	SPRINT
SQ	SQUARE
SS	SANITARY SEWER
ST	STREET
STA	STATION
STD	STANDARD
STL	STEEL
STN STL	STAINLESS STEEL
STRUCT	STRUCTURAL
SWG	SOUTHWEST GAS
T & G	TONGUE AND GROOVE
T OR t	STEEL PIPE CYLINDER THICKNESS
TAN	TANGENT
TBM	TEMPORARY BENCH MARK
TC	TELEMETRY CABLE
TCE	TEMPORARY CONSTRUCTION EASEMENT
TEL	TELEPHONE
THRD	THREAD
TF	TOP OF FOOTING
TM	TELEPHONE MANHOLE
TMH	TOP OF MANHOLE
TOL	TOLERANCE
TOW	TOP OF WALL
TP	TELEPHONE POLE OR TELEGRAPH POLE
TYP	TYPICAL
UG	UNDERGROUND
UGC	UNDERGROUND CONDUIT
UGP	UNDERGROUND POWER
UNC	UNIFIED THREAD STANDARD, COARSE SERIES
UNK	UNKNOWN
VAR	VARIES OR VARIABLE
VCP	VITRIFIED CLAY PIPE
VERT	VERTICAL
VOL	VOLUME
VPI	VERTICAL POINT OF INTERSECTION
W	WEST, WASTE OR WATER
W/	WITH
WILTEL	WILTEL
WP	WEATHERPROOF
WS	WATER SURFACE
WSP	WELDED STEEL PIPE
WSTP	WATER STOP
WT	WEIGHT
WVL	WEST VALLEY LATERAL
YD	YARD

DETAIL CALLOUT LEGEND

X — DETAIL (NUMBER) OR SECTION (LETTER) DESIGNATION
X — DRAWING NUMBER WHERE CORRESPONDING DETAIL OR SECTION IS SHOWN OR CALLED OUT (REPLACED WITH A LINE IF SHOWN ON SAME SHEET)

LEGEND

Symbol	Description
	SECTION CORNER
	BENCH MARK
	HORIZONTAL AND VERTICAL CONTROL POINT
	MONITORING WELL
	UTILITY POLE
	BUTTERFLY VALVE
AV/AR OR AR	AIR VACUUM AND/OR AIR RELEASE ASSEMBLY
	GATE VALVE
	PLUG VALVE
	DRAIN VALVE OUTLET
	CENTERLINE
	SECTION LINE
	ROW LINE
	PERMANENT EASEMENT
	TEMPORARY CONSTRUCTION EASEMENT
	PROPERTY LINE
	NEW STRUCTURE OR FACILITY
	EXISTING / UNDER CONSTRUCTION STRUCTURE OR FACILITY
	EXISTING FENCE
	RAIL ROAD
	EXISTING CULVERT
FO	EXISTING FIBER OPTICS LINE
UGP	EXISTING UNDERGROUND POWER LINE
OHP	EXISTING OVERHEAD POWER LINE
G	EXISTING GAS LINE
TEL	EXISTING TELEPHONE LINE / TELEPHONE LINE
SS	EXISTING SANITARY SEWER LINE / SEWER LINE
SD	EXISTING STORM DRAIN / STORM DRAIN LINE
W	EXISTING WATER LINE / WATER LINE
CATV	EXISTING CABLE TELEVISION LINE
IRR	IRRIGATION WATER LINE OR RECLAIMED WATER LINE
	CONTOUR LINE, EXISTING GRADE
	SPOT ELEVATION

GENERAL NOTES

1. UTILITIES SHOWN ON THE DRAWINGS ARE BASED ON THE BEST AVAILABLE INFORMATION AT THE TIME OF DESIGN. CONTRACTOR SHALL VERIFY ALL UTILITY LOCATIONS BY CALLING 1-800-227-2800 AT LEAST TWO WORKING DAYS PRIOR TO COMMENCEMENT OF WORK
2. ALL PROPERTY AND RIGHT-OF-WAY INFORMATION PROVIDED BY PENTACORE, INC
3. AERIAL MAPPING WAS COMPLETED BY TRI-STATE IN 1998
4. PROTECTION OF EXISTING SURVEY MONUMENTS OR PROPERTY STAKES, WHETHER SHOWN ON THE DRAWINGS OR NOT, SHALL BE THE CONTRACTOR'S RESPONSIBILITY

PIPELINE NOTES

1. ALL 12" PIPE SHALL BE HIGH DENSITY POLYETHYLENE (HDPE), DR11. ALL 8" AND 10" PIPE SHALL BE HDPE, DR9
2. EXCEPT WHERE OTHERWISE SHOWN, BOTH INLET AND OUTLET PIPELINES SHALL BE INSTALLED IN A COMMON TRENCH AT THE SAME INVERT ELEVATION.
3. WHERE VERT Δ POINTS ARE SHOWN IN THE PROFILE, THE REQUIRED DEFLECTION SHALL BE ACHIEVED BY BENDING THE PIPE UNLESS A FITTING IS SPECIFICALLY CALLED OUT
4. MINIMUM RADIUS OF BEND SHALL BE 15' FOR 8" PIPE 25' FOR 10" PIPE AND 35' FOR 12" PIPE
5. ANTI FLOTATION ANCHORS SHALL BE INSTALLED ON THE PIPELINES AT XX INTERVALS BETWEEN STATION XX+XX.XX AND STATION XX+XX.XX AND AT ANY OTHER LOCATION WHERE GROUND WATER IS ENCOUNTERED DURING TRENCHING

Call before you Dig 1-800-227-2600

Call before you OVERHEAD 1-702-593-6111

CITY OF HENDERSON - APPROVAL
Ken Y. Koshiro, P.E. NEW DEVELOPMENT ENGINEER CITY OF HENDERSON — DATE

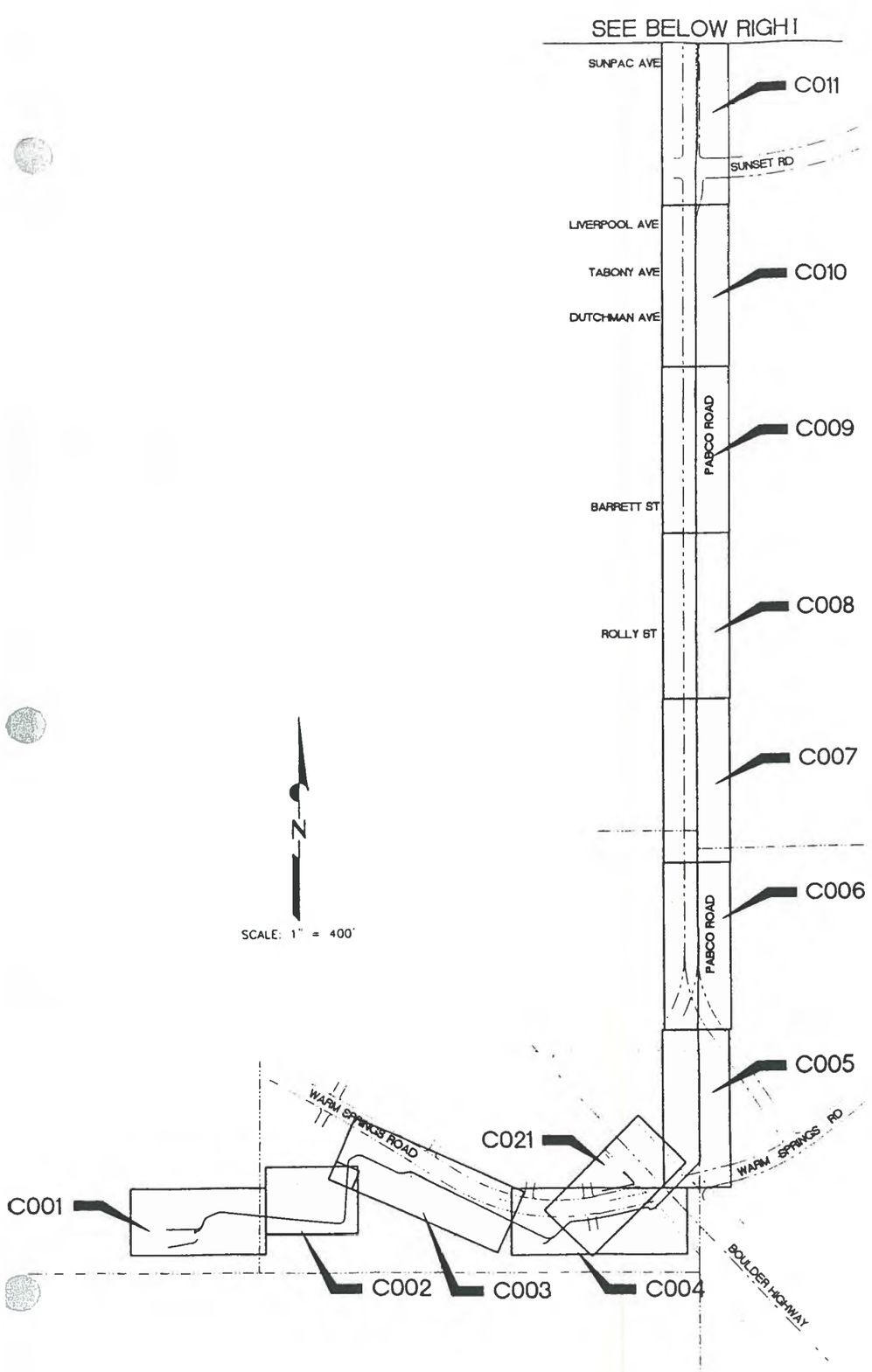
PROFESSIONAL ENGINEER - STATE OF NEVADA — JAMES J. TUCKER — CIVIL

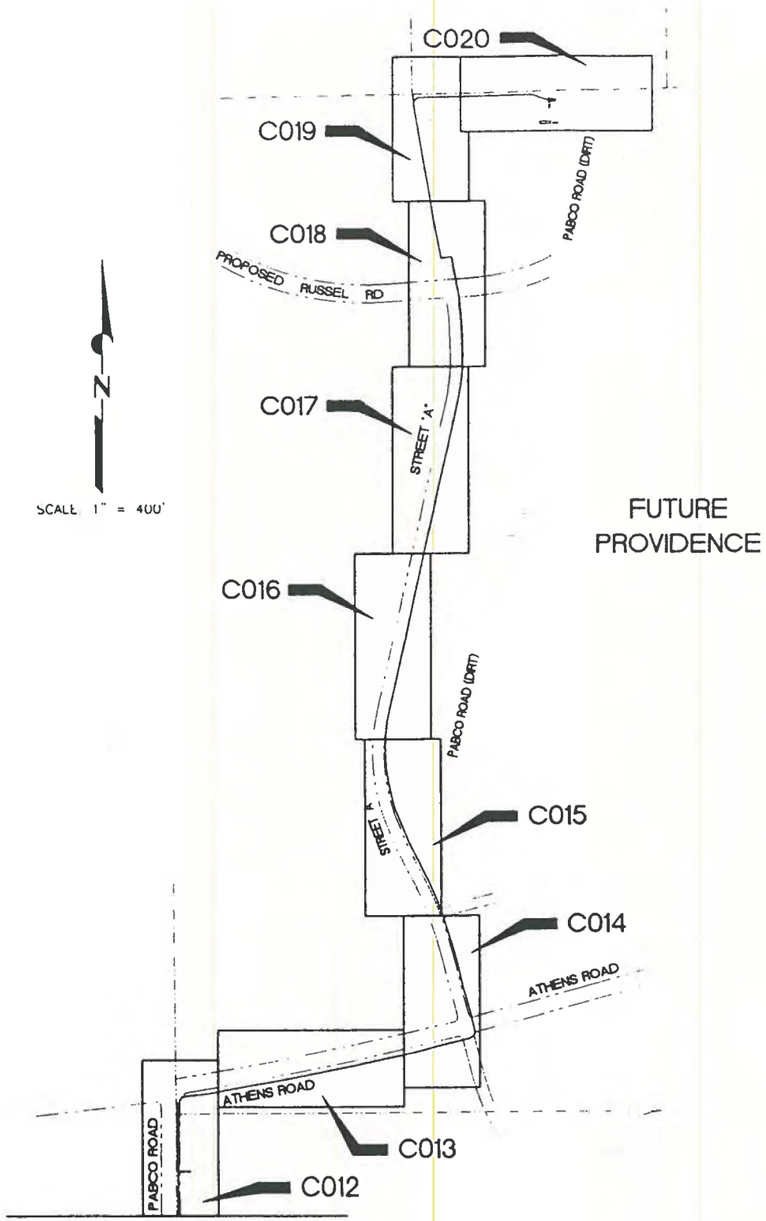
PAPER SIZE: A — DRAWING NO: G002 — SHEET OF

KERR-McGEE CHEMICAL LLC
P.O. BOX 55 HENDERSON, NEV. 89009-7000
COLLECTION and TREATMENT FACILITY
INLET/OUTLET PIPELINES
LEGEND, ABBREV., AND GEN. NOTES

DESIGN: DRAWN BY J. APPLING 1/18/00; PROJ ENGR J. TUCKER; ENGR MNGR EM SPORE
APPROVED FOR CONSTRUCTION: SAFETY; ENVIRONMENTAL; OPERATIONS MNGR; PRODUCTION SUPT; QLTY CONTROL; PROCESS ENGR; PROJECT ENGR; ENGR MNGR; PLANT MNGR
REVISIONS: Δ RECORD DRAWINGS — CLL 10/19
JOB No

PBSJ





MATCHLINE STA 116+00
SEE ABOVE LEFT

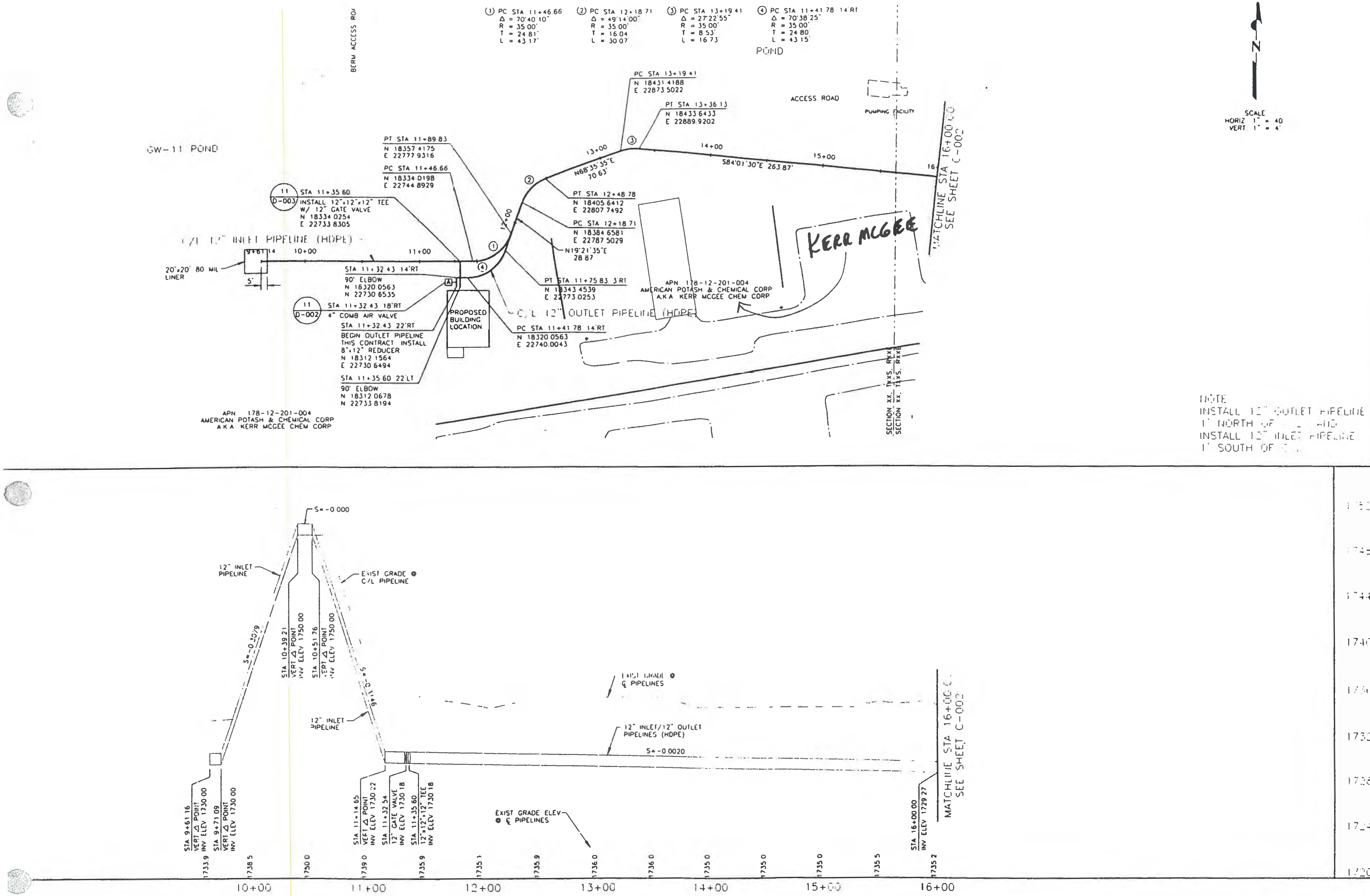
KERR-Mc GEE CHEMICAL LLC
P.O. BOX 55 HENDERSON, NEV. 89009-7000
JOB No.
AFE No.
COLLECTION and TREATMENT FACILITIES
INLET/OUTLET PIPELINES
OVERALL DRAWING INDEX
SCALE: AS INDICATED
DATE:
PBS&J
RECORD DRAWINGS
CLL 10/19
APPROVED FOR CONSTRUCTION
DESIGN DRAWN BY PROJ ENGR ENGR MANGR
SAFETY ENVIRONMENTAL OPERATIONS MNGR PRODUCTION SUPT QLTY CONTROL
PROCESS ENGR PROJECT ENGR ENGR MNGR PLANT MNGR
DATE 7/15/00

Call before you
Call before you

CITY OF HENDERSON - APPROVAL
Ken Y. Koshiro, P.E.
DATE

PROFESSIONAL ENGINEER-STATE OF NEVADA
JAMES J TUCKER
CIVIL

PAPER SIZE A
DRAWING NO G004
SHEET OF
REVISION



GRAPHIC SCALE

(IN FEET) 1 inch = 40 ft.

Call before you Dig

RICHARD J. CAPP RESPONSIBILITY FOR THESE PLANS INCLUDES ALL BUBBLED CHANGES AND CHANGES NOTED IN

PROFESSIONAL ENGINEER - STATE OF NEVADA RICHARD J. CAPP CIVIL No. 12877

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PROFESSIONAL ENGINEER - STATE OF NEVADA JAMES J. TUCKER CIVIL

PAPER SIZE A

DRAWING NO. C-001

SHEET 5 OF 28

REVISION

KERR-McGEE CHEMICAL LLC

P.O. BOX 55 HENDERSON, NEV. 89009-7000

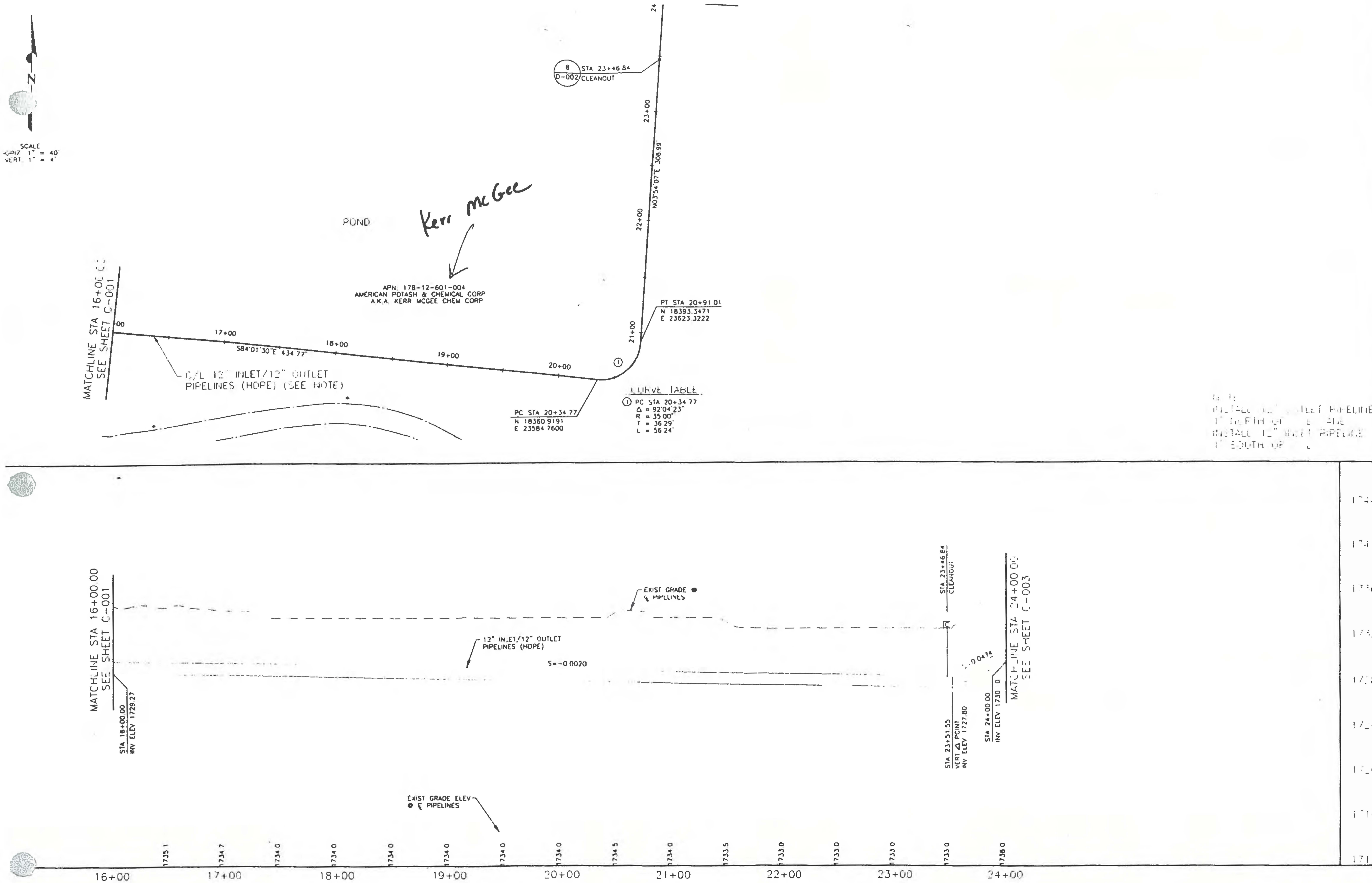
INLET/OUTLET PIPELINES PLAN + PROFILE STA 9+61.16 TO STA 16+00

PBS&J

JOB No.

APPROVED FOR CONSTRUCTION

DESIGN



Call before you HEAD

Call before you Dig

GRAPHIC SCALE

(IN FEET)

RICHARD J CAPP RESPONSIBILITY FOR THESE PLANS INCLUDES ALL BUBBLED

PROFESSIONAL ENGINEER - STATE OF NEVADA — RICHARD J CAPP — CIVIL

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PROFESSIONAL ENGINEER - STATE OF NEVADA — JAMES J TUCKER — CIVIL

PAPER SIZE	DRAWING NO.	SHEET
A	C-002	6 OF 28

KERR-MC GEE CHEMICAL LLC

P.O. BOX 55 HENDERSON, NEV. 89009-7000

INLET/OUTLET PIPELINES
PLAN + PROFILE
STA 16+00 TO STA 24+00

SCALE AS NOTED

DATE 5/05

JOB No

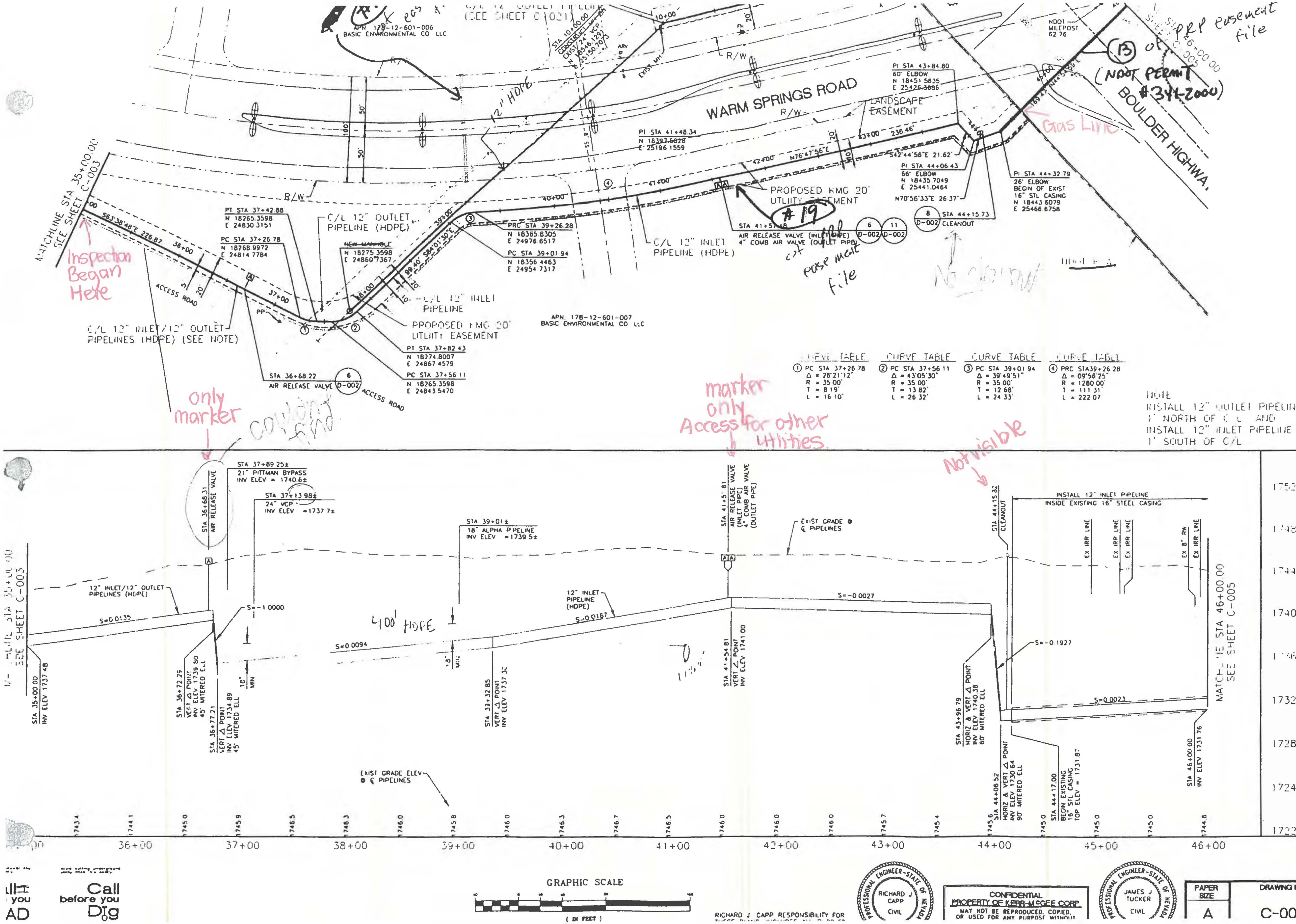
AFE No.

APPROVED FOR CONSTRUCTION

DESIGN / DRAWN BY / PROJ ENGR / ENGR MNGR — J. J. TUCKER — E.M. SPORE

SAFETY / ENVIRONMENTAL / OPERATIONS MNGR / PRODUCTION SUPT. / QLTY. CONTROL / PROCESS ENGR / PROJECT ENGR / ENGR MNGR / PLANT MNGR

PBS&J



WARM SPRINGS ROAD
BOULDER HIGHWAY
MATCHLINE STA 35+00.00 SEE SHEET C-003
APN 178-12-601-006 BASIC ENVIRONMENTAL CO LLC
APN 178-12-601-007 BASIC ENVIRONMENTAL CO LLC
NDOT MILEPOST 62 76
LANDSCAPE EASEMENT
PROPOSED KMG 20' UTILITY EASEMENT
C/L 12" OUTLET PIPELINE (HDPE)
C/L 12" INLET PIPELINE (HDPE)
C/L 12" INLET PIPELINE
C/L 12" INLET/12" OUTLET PIPELINES (HDPE) (SEE NOTE)
ACCESS ROAD
PI STA 37+42.88 N 18265.3598 E 24830.3151
PC STA 37+26.78 N 18268.9972 E 24814.7784
PRC STA 39+26.28 N 18365.8305 E 24976.6517
PC STA 39+01.94 N 18356.4463 E 24954.7317
PI STA 37+82.43 N 18274.8007 E 24867.4579
PC STA 37+56.11 N 18265.3598 E 24843.5470
PI STA 41+48.34 N 18397.6828 E 25196.1559
PI STA 43+84.80 60° ELBOW N 18451.5835 E 25426.3086
PI STA 44+06.43 66° ELBOW N 18435.7049 E 25441.0464
PI STA 44+32.79 26° ELBOW BEGIN OF EXIST 16" STL CASING N 18443.6079 E 25466.6758
STA 44+15.73 CLEANOUT
STA 36+68.22 AIR RELEASE VALVE
STA 41+54.81 AIR RELEASE VALVE (INLET PIPE) 4" COMB AIR VALVE (OUTLET PIPE)
CURVE TABLE ① PC STA 37+26.78 Δ = 26°21'12" R = 35.00' T = 8.19' L = 16.10'
CURVE TABLE ② PC STA 37+56.11 Δ = 43°05'30" R = 35.00' T = 13.82' L = 26.32'
CURVE TABLE ③ PC STA 39+01.94 Δ = 39°49'51" R = 35.00' T = 12.68' L = 24.33'
CURVE TABLE ④ PRC STA 39+26.28 Δ = 09°56'25" R = 1280.00' T = 111.31' L = 222.07'
NOTE: INSTALL 12" OUTLET PIPELINE 1' NORTH OF C/L AND INSTALL 12" INLET PIPELINE 1' SOUTH OF C/L
STA 37+89.25± 21" PITTMAN BYPASS INV ELEV = 1740.6±
STA 37+13.98± 24" VCP INV ELEV = 1737.7±
STA 39+01± 18" ALPHA PIPELINE INV ELEV = 1739.5±
INSTALL 12" INLET PIPELINE INSIDE EXISTING 16" STEEL CASING
EXIST GRADE @ Ç PIPELINES
12" INLET/12" OUTLET PIPELINES (HDPE)
12" INLET PIPELINE (HDPE)
S=0.0135
S=-1.0000
S=0.0094
S=0.0167
S=-0.0027
S=-0.1927
S=0.0023
MATCHLINE STA 46+00.00 SEE SHEET C-005
GRAPHIC SCALE (IN FEET)
Inspection Began Here
only marker
marker only Access for other utilities
Not visible
Gas Line
(NDOT PERMIT #341-2000)
#19
12" HDPE
400' HDPE
35+00 36+00 37+00 38+00 39+00 40+00 41+00 42+00 43+00 44+00 45+00 46+00
Call before you Dig

KERR-McGEE CHEMICAL LLC
P.O. BOX 55 HENDERSON, NEV. 89009-7000

INLET/OUTLET PIPELINE PLAN + PROFILE STA 35+00 TO STA 46+00

PBS&J

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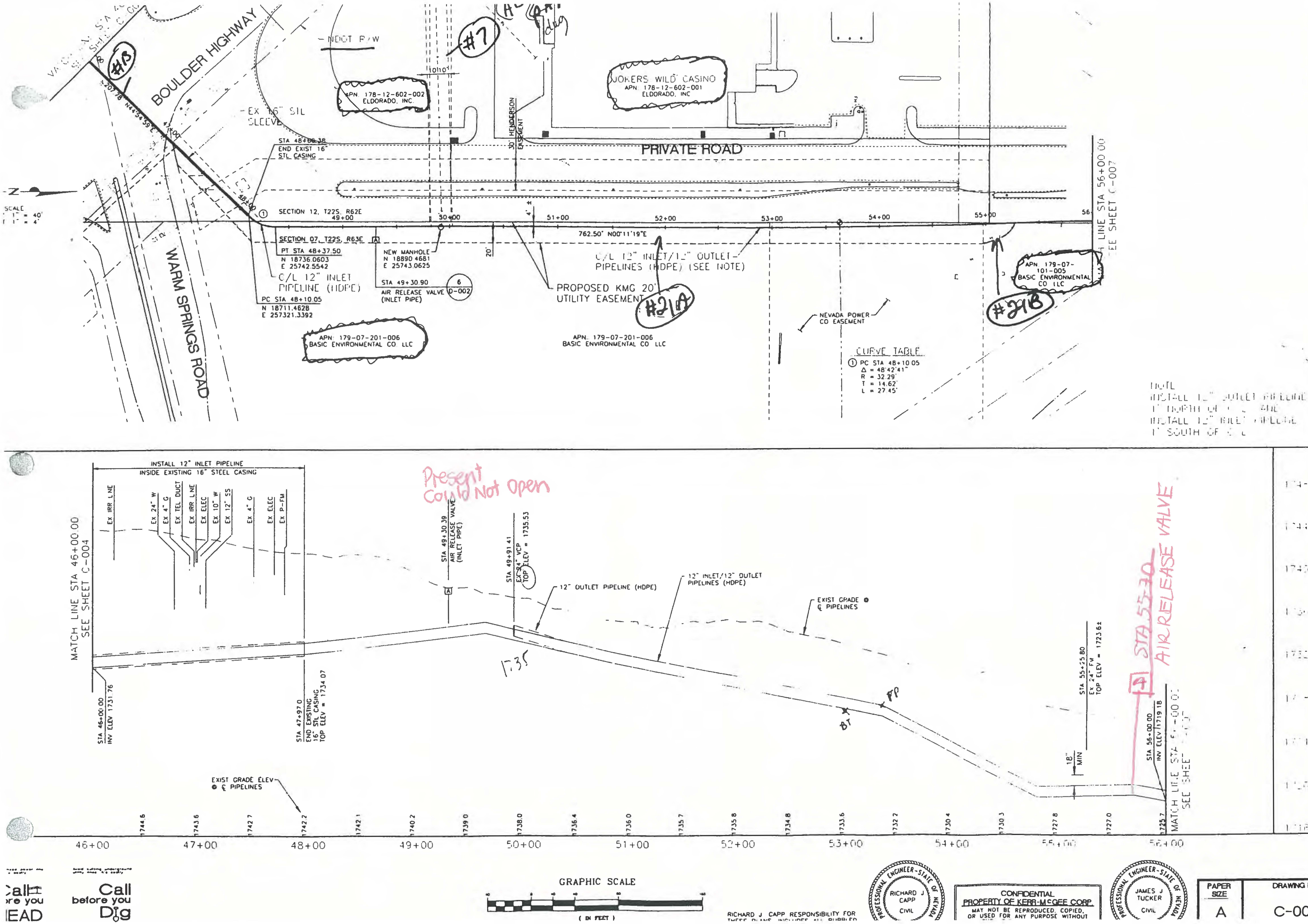
RICHARD J. CAPP RESPONSIBILITY FOR

PROFESSIONAL ENGINEER - STATE OF NEVADA RICHARD J. CAPP CIVIL

PROFESSIONAL ENGINEER - STATE OF NEVADA JAMES J. TUCKER CIVIL

PAPER SIZE A

DRAWING NO. C-004



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CIVIL

JAMES J. TUCKER
CIVIL

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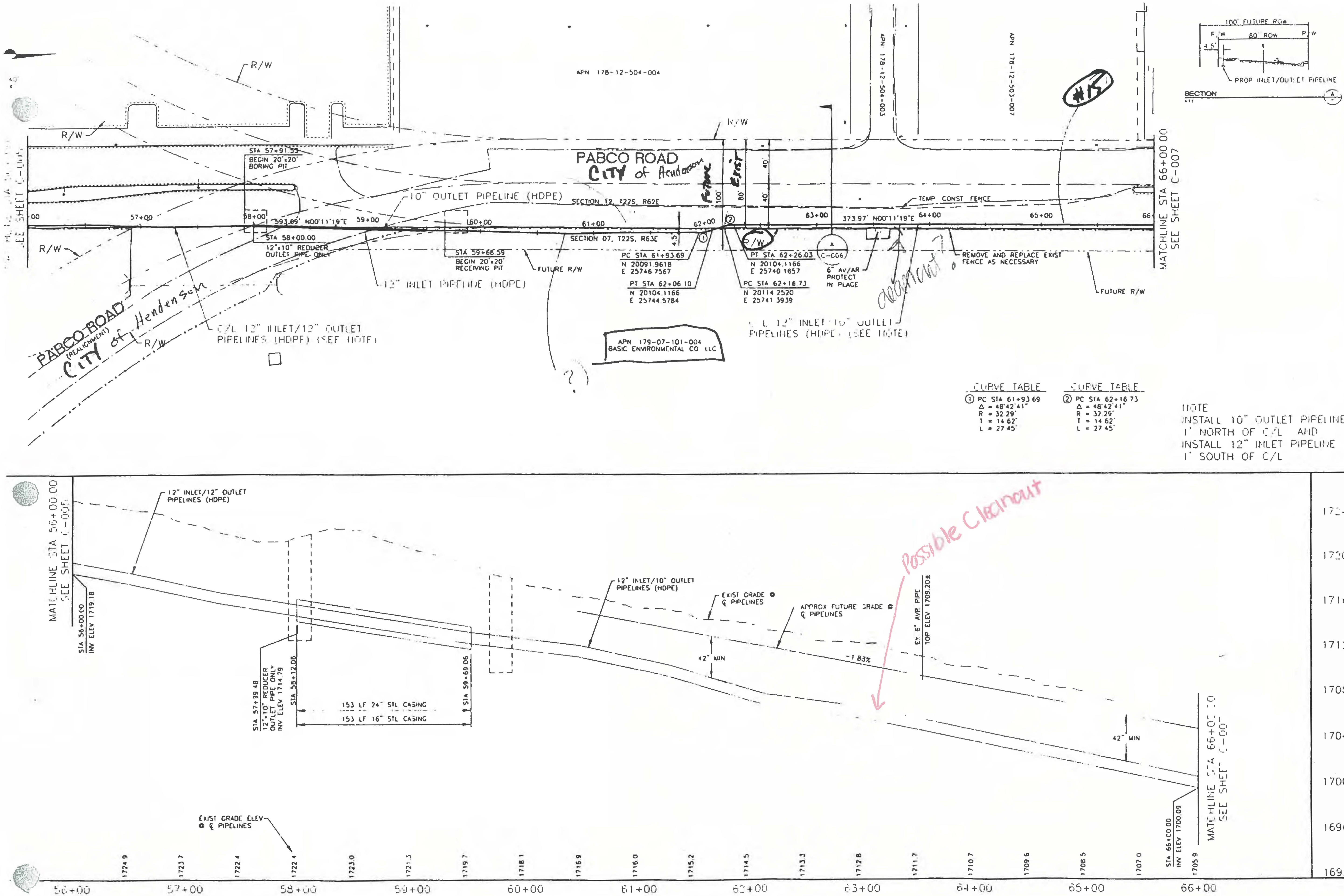
P.O. BOX 55 HENDERSON NEV 89009-7000

INLET/OUTLET PIPELINE
PLAN + PROFILE
STA 46+00 TO STA 56+00

PAPER SIZE: A
DRAWING NO: C-005
SHEET 9 OF 18



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PROFESSIONAL ENGINEER - STATE OF NEVADA - JAMES J. TUCKER - CIVIL

KERR-McGEE CHEMICAL LLC

P.O. BOX 55 HENDERSON, NEV. 89009-7000

INLET/OUTLET PIPELINE
PLAN + PROFILE
STA 56+00 TO STA 66+00

PBS&J

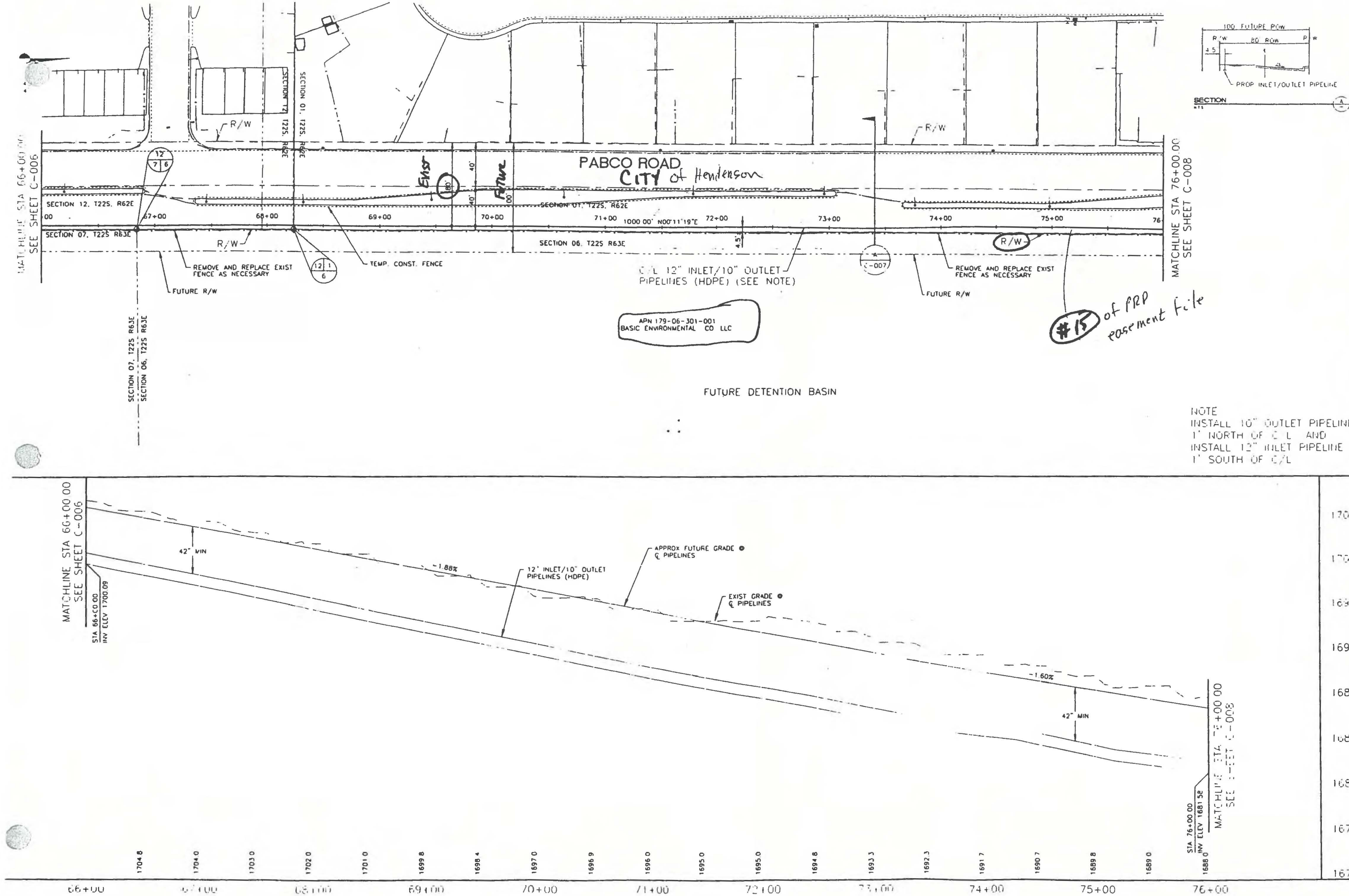
DESIGN: DRAWN BY J. ARPOLO; PROJ. ENGR JJ TUCKER; ENGR MNGR EM SCOPE

APPROVED FOR CONSTRUCTION: SAFETY, ENVIRONMENTAL, OPERATIONS MNGR, PRODUCTION SUPT, QLTY CONTROL; PROCESS ENGR, PROJECT ENGR, ENGR MNGR, PLANT MNGR

PAPER SIZE: A

DRAWING NO. C-006

SHEET 18



GRAPHIC SCALE

RICHARD J. CAPP

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JAMES J. TUCKER

KERR-McGEE CHEMICAL LLC

P.O. BOX 55 HENDERSON, NEV. 89009-7000

TOLERANCE UNLESS OTHERWISE SPECIFIED

FRACTIONS ±
AFE No. 0.00 ±
0.000 ±

JOB No.

REVISIONS

REV	DESCRIPTION	BY	DATE

INLET/OUTLET PIPELINE PLAN + PROFILE STA 66+00 TO STA 76+00

SCALE: AS NOTED

DATE:

DESIGN		DATE
DRAWN BY	J. ARROYO	11/11/11
PROJ. ENGR	JJ TUCKER	
ENGR MNGR	EM SPOEL	

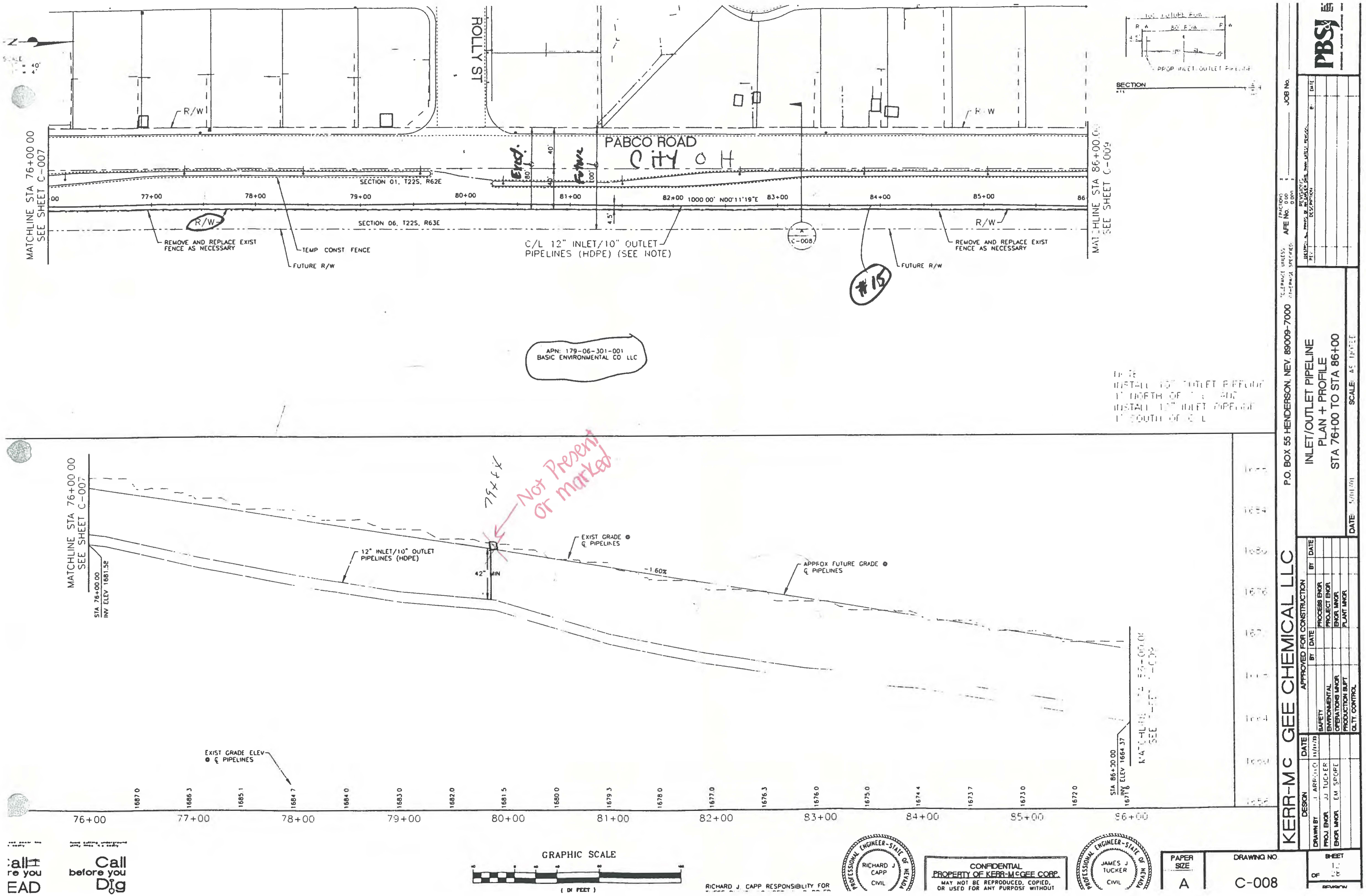
APPROVED FOR CONSTRUCTION	BY	DATE		BY	DATE
SAFETY			PROCESS ENGR		
ENVIRONMENTAL			PROJECT ENGR		
OPERATIONS MNGR			ENGR. MNGR		
PRODUCTION SUPT			PLANT MNGR		
QLTY. CONTROL					

PBS&J

PAPER SIZE

DRAWING NO

SHEET OF



ROLLY ST
PABCO ROAD
City of H
R/W
SECTION 01, T22S, R62E
SECTION 06, T22S, R63E
MATCHLINE STA 76+00.00 SEE SHEET C-007
MATCHLINE STA 86+00.00 SEE SHEET C-009
77+00
78+00
79+00
80+00
81+00
82+00
1000.00' N00°11'19"E
83+00
84+00
85+00
REMOVE AND REPLACE EXIST FENCE AS NECESSARY
TEMP CONST FENCE
FUTURE R/W
C/L 12" INLET/10" OUTLET PIPELINES (HDPE) (SEE NOTE)
#15
APN: 179-06-301-001
BASIC ENVIRONMENTAL CO LLC
SECTION
12" INLET/10" OUTLET PIPELINES (HDPE)
42" MIN
EXIST GRADE @ ℄ PIPELINES
-1.60%
APPROX FUTURE GRADE @ ℄ PIPELINES
Not Present or marked
STA 76+00.00 INV ELEV 1681.58
STA 86+00.00 INV ELEV 1664.37
EXIST GRADE ELEV @ ℄ PIPELINES
1687.0
1686.3
1685.1
1684.7
1684.0
1683.0
1682.0
1681.5
1680.0
1679.3
1678.0
1677.0
1676.3
1676.0
1675.0
1674.4
1673.7
1673.0
1672.0
1671.6
76+00
77+00
78+00
79+00
80+00
81+00
82+00
83+00
84+00
85+00
86+00
GRAPHIC SCALE
(IN FEET)
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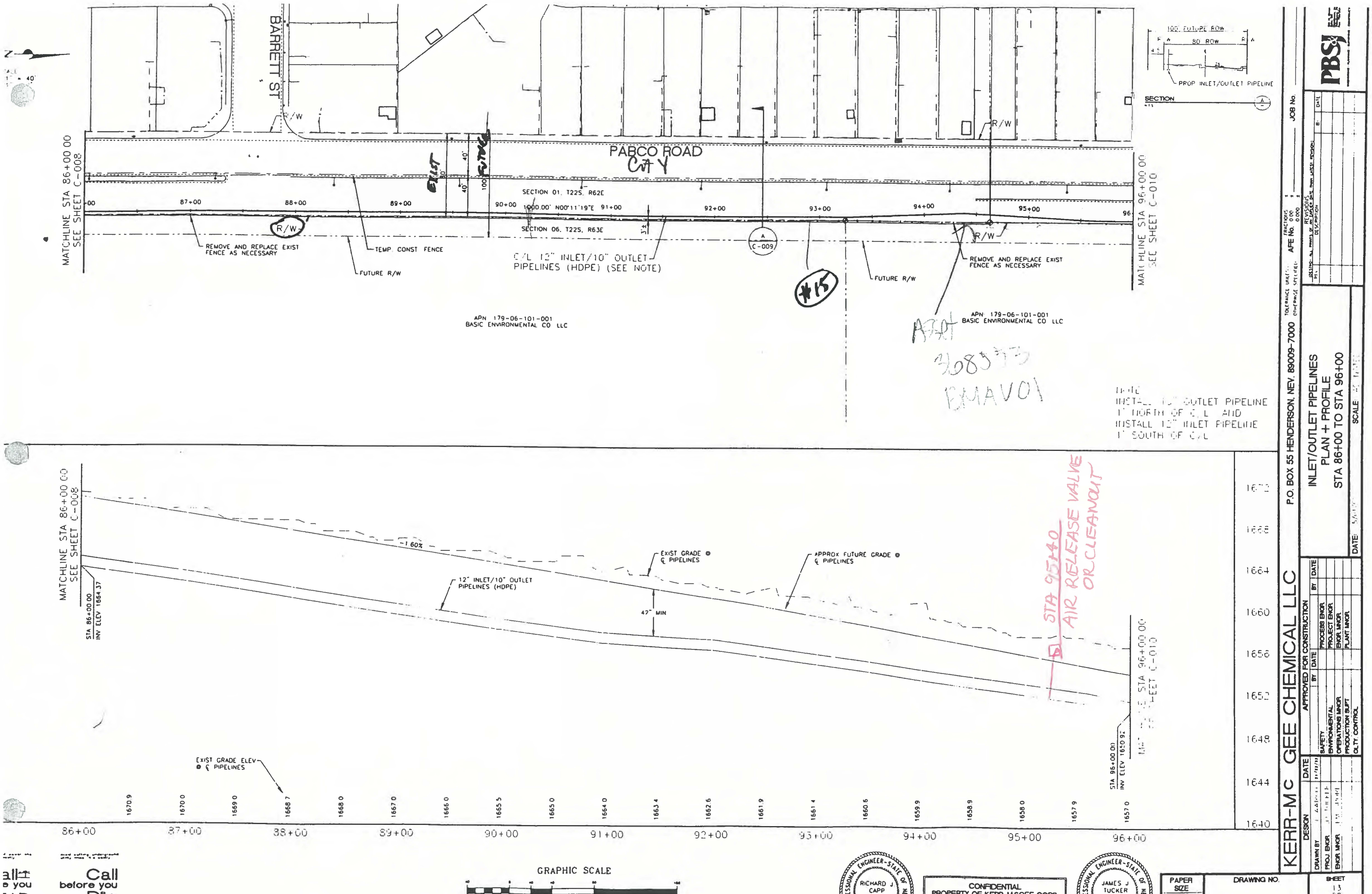
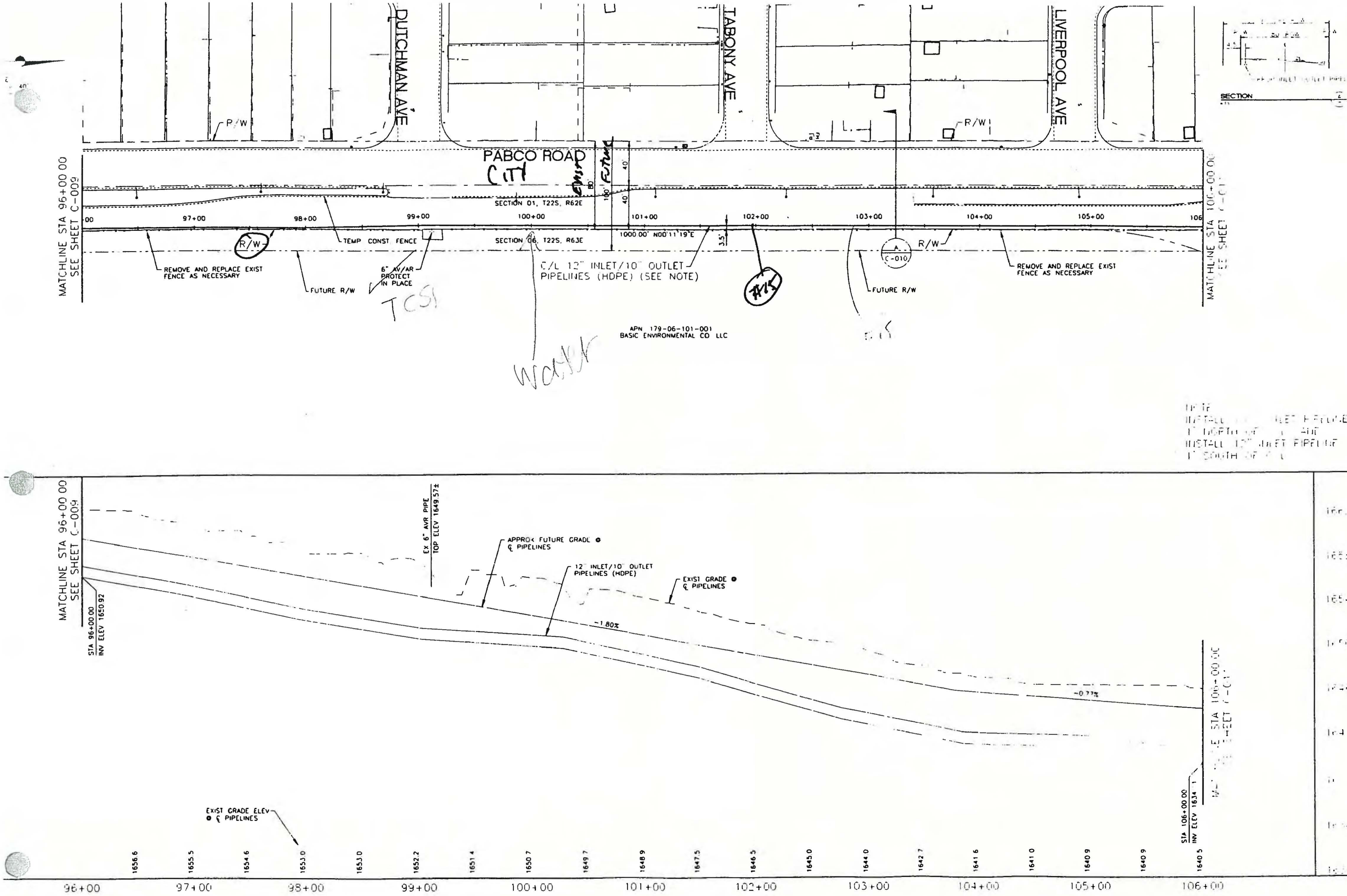
JAMES J. TUCKER CIVIL
PBS&J
KERR-MC GEE CHEMICAL LLC
P.O. BOX 55 HENDERSON, NEV. 89009-7000
INLET/OUTLET PIPELINE
PLAN + PROFILE
STA 76+00 TO STA 86+00
APPROVED FOR CONSTRUCTION
DESIGN
DRAWN BY
PROJ ENGR
ENGR MNGR
J. TUCKER
EM SPOFE
SAFETY
ENVIRONMENTAL
OPERATIONS MNGR
PRODUCTION SUPT
QLTY CONTROL
PROCESS ENGR
PROJECT ENGR
ENGR MNGR
PLANT MNGR
JOB No.
AFE No.
SCALE: AS NOTED
DATE:
PAPER SIZE
A
DRAWING NO
C-008
SHEET


BARRETT ST
R/W
PABCO ROAD
C/T Y
EXIST
FUTURE
SECTION 01, T22S, R62E
SECTION 06, T22S, R63E
1000.00' N00°11'19"E
86+00
87+00
88+00
89+00
90+00
91+00
92+00
93+00
94+00
95+00
96+00
MATCHLINE STA 86+00.00 SEE SHEET C-008
MATCHLINE STA 96+00.00 SEE SHEET C-010
REMOVE AND REPLACE EXIST FENCE AS NECESSARY
TEMP. CONST FENCE
FUTURE R/W
C/L 12" INLET/10" OUTLET PIPELINES (HDPE) (SEE NOTE)
A C-009
#15
APN 179-06-101-001 BASIC ENVIRONMENTAL CO LLC
100' FUTURE ROW
80' ROW
PROP INLET/OUTLET PIPELINE
SECTION A
NOTE
INSTALL 10" OUTLET PIPELINE 1' NORTH OF C/L AND INSTALL 12" INLET PIPELINE 1' SOUTH OF C/L
-1.60%
EXIST GRADE @ ℄ PIPELINES
APPROX FUTURE GRADE @ ℄ PIPELINES
12" INLET/10" OUTLET PIPELINES (HDPE)
47" MIN
STA 86+00.00 INV ELEV 1664.37
STA 96+00.01 INV ELEV 1650.92
STA 95+40 AIR RELEASE VALVE OR CLEANOUT
EXIST GRADE ELEV @ ℄ PIPELINES
1670.9
1670.0
1669.0
1668.7
1668.0
1667.0
1666.0
1665.5
1665.0
1664.0
1663.4
1662.6
1661.9
1661.4
1660.6
1659.9
1658.9
1658.0
1657.9
1657.0
1640
1644
1648
1652
1656
1660
1664
1668
1672
GRAPHIC SCALE
Call before you Dig
RICHARD J. CAPP
JAMES J. TUCKER
CONFIDENTIAL PROPERTY OF KERR-McGEE CORP.
KERR-McGEE CHEMICAL LLC
P.O. BOX 55 HENDERSON, NEV. 89009-7000
INLET/OUTLET PIPELINES PLAN + PROFILE STA 86+00 TO STA 96+00
APPROVED FOR CONSTRUCTION
DESIGN
DRAWN BY
PROJ ENGR
ENGR MNGR
SAFETY
ENVIRONMENTAL
OPERATIONS MNGR
PRODUCTION SUPT
QLTY CONTROL
PROCESS ENGR
PROJECT ENGR
ENGR MNGR
PLANT MNGR
JOB No.
AFE No.
REVISIONS
PBS&J
PAPER SIZE
DRAWING NO.
SHEET 13 OF 28



DUTCHMAN AVE
TABONY AVE
LIVERPOOL AVE
P/W
R/W
PABCO ROAD
CITY
SECTION 01, T22S, R62E
SECTION 06, T22S, R63E
97+00
98+00
99+00
100+00
101+00
102+00
103+00
104+00
105+00
1000.00' N00°11'19"E
MATCHLINE STA 96+00.00 SEE SHEET C-009
MATCHLINE STA 106+00.00
REMOVE AND REPLACE EXIST FENCE AS NECESSARY
FUTURE R/W
TEMP CONST FENCE
6" AV/AR PROTECT IN PLACE
C/L 12" INLET/10" OUTLET PIPELINES (HDPE) (SEE NOTE)
C-010
APN 179-06-101-001
BASIC ENVIRONMENTAL CO LLC
SECTION
EX 6" AVR PIPE TOP ELEV 1649.57±
APPROX FUTURE GRADE @ ℄ PIPELINES
12" INLET/10" OUTLET PIPELINES (HDPE)
EXIST GRADE @ ℄ PIPELINES
-1.80%
-0.77%
STA 96+00.00 INV ELEV 1650.92
STA 106+00.00 INV ELEV 1634.1
EXIST GRADE ELEV @ ℄ PIPELINES
1656.6
1655.5
1654.6
1653.0
1653.0
1652.2
1651.4
1650.7
1649.7
1648.9
1647.5
1646.5
1645.0
1644.0
1642.7
1641.6
1641.0
1640.9
1640.9
1640.5
96+00
97+00
98+00
99+00
100+00
101+00
102+00
103+00
104+00
105+00
106+00
GRAPHIC SCALE

Call before you Dig

KERR-MC GEE CHEMICAL LLC

P.O. BOX 55 HENDERSON, NEV. 89009-7000

INLET/OUTLET PIPELINES
PLAN + PROFILE
STA 96+00 TO STA 106+00

APPROVED FOR CONSTRUCTION

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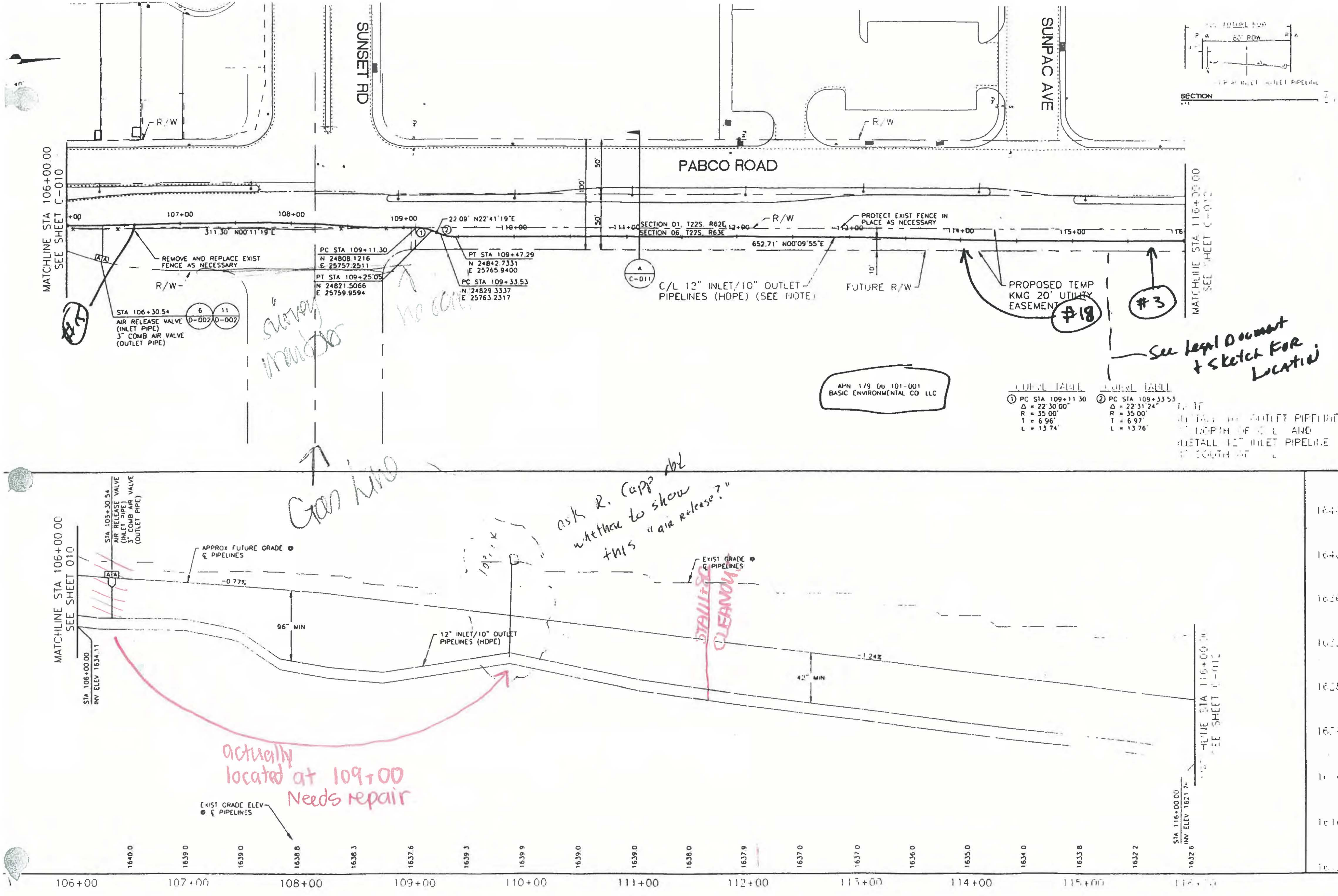
JAMES J. TUCKER CIVIL

PAPER SIZE	DRAWING NO	SHEET
A	C-010	14 OF 28


SUNSET RD
SUNPAC AVE
PABCO ROAD
R/W
MATCHLINE STA 106+00.00 SEE SHEET C-010
MATCHLINE STA 116+00.00 SEE SHEET C-012
107+00
108+00
109+00
110+00
111+00
112+00
113+00
114+00
115+00
311.30' N00°11'19"E
22°09' N22°41'19"E
SECTION 01, T22S, R62E
SECTION 06, T22S, R63E
652.71' N00°09'55"E
REMOVE AND REPLACE EXIST FENCE AS NECESSARY
PC STA 109+11.30
N 24808.1216
E 25757.2511
PT STA 109+25.05
N 24821.5066
E 25759.9594
PT STA 109+47.29
N 24842.7331
E 25765.9400
PC STA 109+33.53
N 24829.3337
E 25763.2317
STA 106+30.54
AIR RELEASE VALVE (INLET PIPE)
3" COMB AIR VALVE (OUTLET PIPE)
C/L 12" INLET/10" OUTLET PIPELINES (HDPE) (SEE NOTE)
FUTURE R/W
PROTECT EXIST FENCE IN PLACE AS NECESSARY
PROPOSED TEMP KMG 20' UTILITY EASEMENT
#18
#3
#7
See Legal Document + Sketch For Location
survey marker
Gas line
APN 179 06 101-001
BASIC ENVIRONMENTAL CO LLC
CURVE TABLE
① PC STA 109+11.30
Δ = 22°30'00"
R = 35.00'
T = 6.96'
L = 13.74'
② PC STA 109+33.53
Δ = 22°31'24"
R = 35.00'
T = 6.97'
L = 13.76'
SECTION
ask R. Capp whether to show this "air release?"
APPROX FUTURE GRADE ℄ PIPELINES
-0.77%
96" MIN
12" INLET/10" OUTLET PIPELINES (HDPE)
EXIST GRADE ℄ PIPELINES
CLEANOUT
-1.24%
42" MIN
STA 106+00.00
INV ELEV 1634.11
STA 116+00.00
INV ELEV 1621.7
actually located at 109+00
Needs repair
EXIST GRADE ELEV ℄ PIPELINES
1640.0
1639.0
1639.0
1638.8
1638.3
1637.6
1639.3
1639.9
1639.0
1639.0
1638.0
1637.9
1637.0
1637.0
1636.0
1635.0
1634.0
1633.8
1632.2
1632.6
106+00
107+00
108+00
109+00
110+00
111+00
112+00
113+00
114+00
115+00
GRAPHIC SCALE

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RICHARD J. CAPP RESPONSIBILITY FOR

RICHARD J CAPP CIVIL — PROFESSIONAL ENGINEER, STATE OF NEVADA

JAMES J TUCKER CIVIL — PROFESSIONAL ENGINEER, STATE OF NEVADA

KERR-McGEE CHEMICAL LLC

P.O. BOX 55 HENDERSON, NEV. 89009-7000

INLET/OUTLET PIPELINES
PLAN + PROFILE
STA 106+00 TO STA 116+00

PBS&J

APPROVED FOR CONSTRUCTION

DESIGN	DATE
DRAWN BY J. ARPS	
PROJ. ENGR. J.J. TUCKER	
ENGR MNGR EM SPOFF	

PAPER SIZE: A

DRAWING NO: C-011

SHEET 15 OF 16

8" WELL COLLECTOR PIPELINE (HDPE) (SEE NOTE 3)

PI STA 121+72.82 4.7 LT
90° ELBOW
N 26073.0612
E 25766.9610

PI STA 118+19.26 3 LT
90° ELBOW
N 25718.6231
E 25766.9610

PABCO ROAD

PUMP STATION No. 2 CONNECTION (7 D-002)

MATCHLINE STA 116+00.00 SEE SHEET C-011

PROTECT EXIST FENCE IN PLACE AS NECESSARY

573.76' N00°08'55"E

20' PERMANENT EASEMENT

FUTURE R/W

PROPOSED TEMP KMG 20' UTILITY EASEMENT

C/L 10" INLET/10" OUTLET PIPELINES (HDPE) (SEE NOTE 2)

C/L 12" INLET/12" OUTLET PIPELINES (HDPE) (SEE NOTE)

PROPOSED PUMP STATION NO. 2

N 25743.5057
E 25811.7692

N 25680.3434
E 25870.8278

N 25743.3431
E 25871.0384

N 25680.5540
E 25811.8176

PUMP STATION No. 2 CONNECTION (7 D-002)

APN 179-06-101-001 BASIC ENVIRONMENTAL CO LLC

PC STA 121+73.76
N 26065.3820
E 25770.9664

PRC STA 122+24.24
N 26099.8835
E 25800.7050

CURVE TABLE
① PC STA 121+73.76
Δ = 82°37'49"
R = 35.00'
T = 30.76'
L = 50.48'

SECTION 06, T22S, R63E
SECTION 31, T21S, R63E

PROPOSED 1 MG 20' UTILITY EASEMENT

MATCHLINE STA 124+00.00 SEE SHEET C-013

CAP END OF 8" PIPE AT R/W LINE

ADDED TELEMETRY CABLES FROM PUMP STATION #2 TO PUMP STATION #1 AND #3

ATHENS ROAD

R/W

BASIC ENVIRONMENTAL CO LLC

PITTMAN LATERAL

PROPOSED DRAINAGE CHANNEL (BY OTHERS)

100' R/W
80' R/W
10'
PROP INLET/OUTLET PIPELINE
SECTION

NOTE
1. INSTALL 10" OUTLET PIPELINE 1' WEST OF C/L AND INSTALL 12" INLET PIPELINE 1' EAST OF C/L
2. INSTALL 10" OUTLET PIPELINE 1' NORTH OF C/L AND INSTALL 10" INLET PIPELINE 1' SOUTH OF C/L
3. INSTALL 8" WELL COLLECTOR PIPELINE 2' WEST OF 10" OUTLET PIPELINE IN SAME TRENCH

Galleria Rd

#3

NEVADA POWER CO PROPOSED SUBSTATION

OWNER

STA 114+30 CLEANOUT

Revised Route to Center of Galleria Rd.

ask R capp ahl

STA 116+00.00
INV ELEV 1621.76

12" INLET/10" OUTLET PIPELINES (HDPE)

-1.24%

APPROX FUTURE GRADE OF PABCO ℄ PIPELINES

STA 118+24.52
12" INLET PIPELINE LATERAL

STA 118+28.52
10" INLET PIPELINE LATERAL

STA 120+07.47
21" PITTMAN BYPASS
TOP ELEV = 1622.63

STA 121+00.00
GRADE BREAK
FG EL = 1621.60

-1.0%

EXIST GRADE ℄ PIPELINES

STA 122+43.15
21" PITTMAN BYPASS
TOP ELEV = 1617.84

-0.95%

ESTIMATED FUTURE GRADE OF ATHENS ℄ (FUTURE DESIGN BY OTHERS)

STA 123+70.00
GRADE BREAK
FG EL = 1619.04

-0.50%

42" MIN

2-16" STEEL CASINGS
1-12" STEEL CASING

40'

10" INLET/10" OUTLET PIPELINES AND 8" WELL COLLECTOR PIPELINES

STA 116+26.52
10" OUTLET PIPELINE LATERAL
INV ELEV 1619.02

STA 118+28.40
8" WELL COLLECTOR PIPELINE
INV ELEV 1616.76

STA 124+00.00
INV ELEV 1613.97

MATCHLINE / STA 124+00.00 SEE SHEET C-013

EXIST GRADE ELEV ℄ PIPELINES

1632.2 1630.5 1630.0 1629.4 1628.6 1627.4 1627.6 1627.3 1626.9 1623.6 1622.5 1622.1 1622.5 1622.8 1626.0 1627.3

1628 1624 1620 1616 1612 1608 1604

116+00 117+00 118+00 119+00 120+00 121+00 122+00 123+00 124+00

GRAPHIC SCALE

Call before you

RICHARD J CAPP — PROFESSIONAL ENGINEER-STATE OF NEVADA

JAMES J TUCKER — PROFESSIONAL ENGINEER-STATE OF NEVADA

CONFIDENTIAL PROPERTY OF KERR-MCGEE CORP

PAPER SIZE

DRAWING NO.

SHEET

KERR-MC GEE CHEMICAL LLC
P.O. BOX 55 HENDERSON, NEV. 89009-7000

INLET/OUTLET PIPELINES
PLAN + PROFILE
STA 116+00 TO STA 124+00

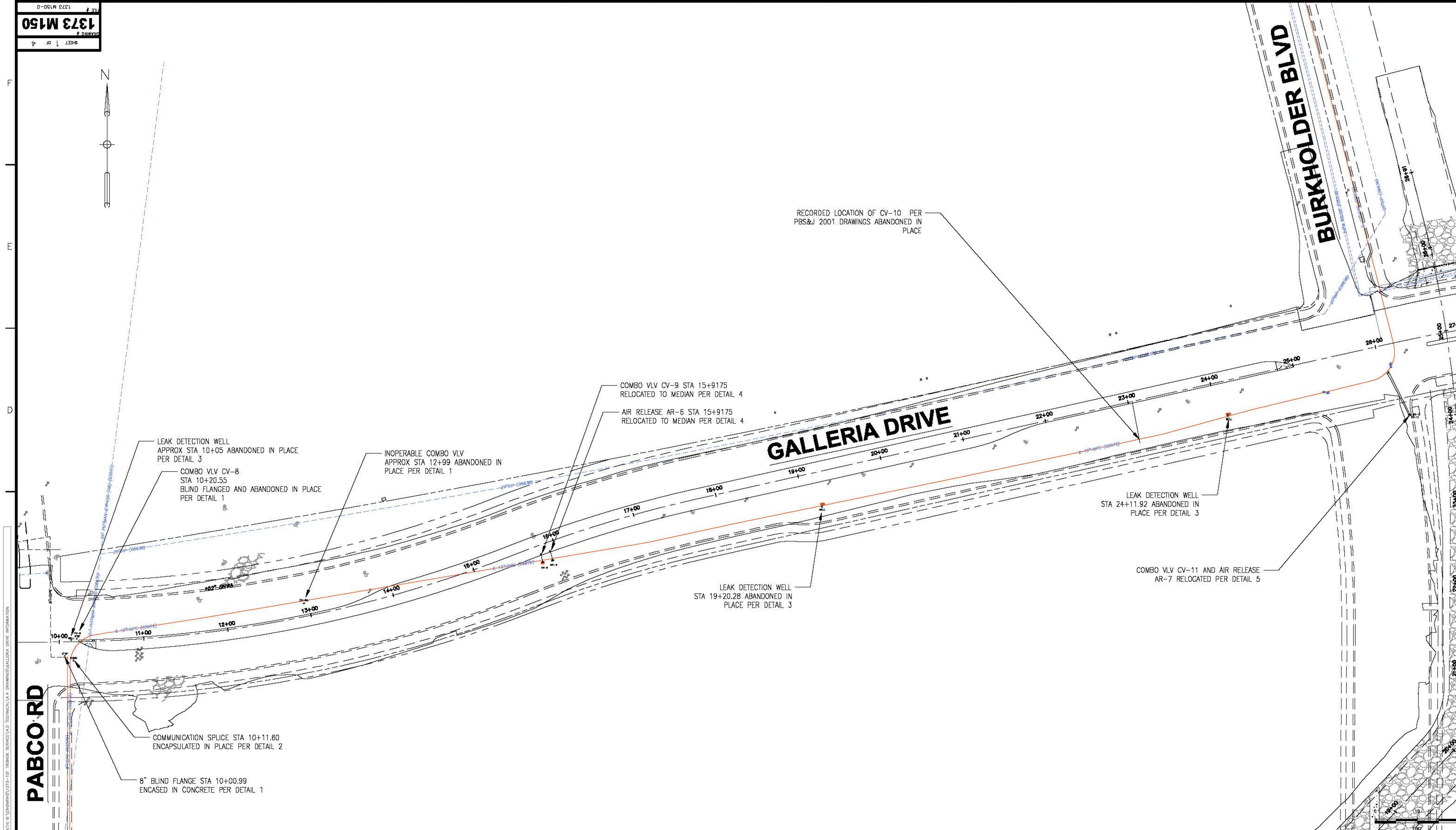
JOB No.
AFE No. C-00
SCALE: AS NOTED
DATE 5/03/01

APPROVED FOR CONSTRUCTION

DESIGN	DATE	BY	DATE
DRAWN BY		SAFETY	PROCESS ENGR.
PROJ. ENGR.		ENVIRONMENTAL	PROJECT ENGR.
ENGR. MAJOR		OPERATIONS MNGR.	ENGR. MNGR.
		PRODUCTION SUPT.	PLANT MNGR.
		QUALITY CONTROL	

REV	DESCRIPTION	BY	DATE
1	RECORD DRAWINGS	CLL	10/19

PBS&J



N
BURKHOLDER BLVD
GALLERIA DRIVE
PABCO RD
RECORDED LOCATION OF CV-10 PER PBS&J 2001 DRAWINGS ABANDONED IN PLACE
COMBO VLV CV-9 STA 15+9175 RELOCATED TO MEDIAN PER DETAIL 4
AIR RELEASE AR-6 STA 15+9175 RELOCATED TO MEDIAN PER DETAIL 4
LEAK DETECTION WELL APPROX STA 10+05 ABANDONED IN PLACE PER DETAIL 3
COMBO VLV CV-8 STA 10+20.55 BLIND FLANGED AND ABANDONED IN PLACE PER DETAIL 1
INOPERABLE COMBO VLV APPROX STA 12+99 ABANDONED IN PLACE PER DETAIL 1
LEAK DETECTION WELL STA 24+11.92 ABANDONED IN PLACE PER DETAIL 3
COMBO VLV CV-11 AND AIR RELEASE AR-7 RELOCATED PER DETAIL 5
LEAK DETECTION WELL STA 19+20.28 ABANDONED IN PLACE PER DETAIL 3
COMMUNICATION SPLICE STA 10+11.60 ENCAPSULATED IN PLACE PER DETAIL 2
8" BLIND FLANGE STA 10+00.99 ENCASED IN CONCRETE PER DETAIL 1

GENERAL NOTES:

1. SEE SHEETS 2 THRU 4 FOR CONSTRUCTION DETAILS

REV	DATE	DESCRIPTION OF REVISION	REVISED BY	CHECKED BY
C	3/18/14	RECORD DRAWING	RL	MDV
B	2/10/14	ISSUED FOR BID	RL	MDV
A	2/4/14	ISSUED FOR DISCUSSION	RL	

THIS IS A COMPUTER GENERATED DRAWING AND ONLY EDITS CONSISTENT WITH ENVIROGEN'S ORIGINAL CAD FORMAT SHALL BE CONSIDERED VALID COPIES.

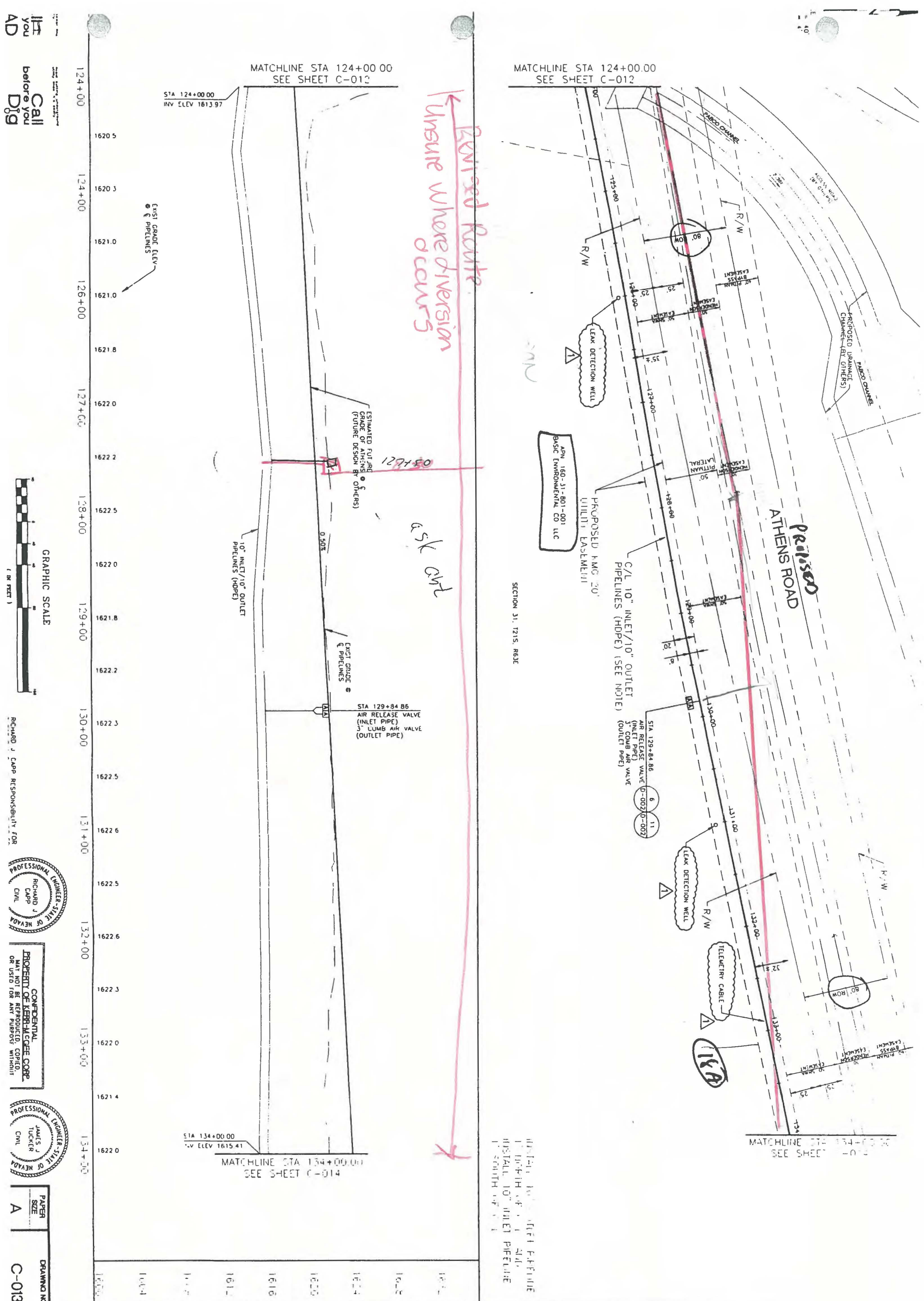
DRAWING SCALE 1" = 50 '
DESIGNED BY/DATE
DRAWN BY/DATE RL/1-27-14
CHECKED BY/DATE

ENVIROGEN TECHNOLOGIES
250 PHILLIPS BLVD. SUITE 255
EWING, NJ 08618
A Lifecycle Performance Company
A member of The Amplio Group

NERT
HENDERSON, NV

GALLERIA DRIVE IMPROVEMENTS
VENTING OF PLANT INLET
AND OUTLET LINES

SHEET SIZE D
REVISION 0
SHEET 1 OF 4
DRAWING # 1373 M150
FILE # 1373 M150-0



MATCHLINE STA 124+00.00
SEE SHEET C-012
STA 124+00.00
INV ELEV 1613.97
EXIST GRADE ELEV @ ℄ PIPELINES
ESTIMATED FUTURE GRADE OF ATHENS @ ℄ (FUTURE DESIGN BY OTHERS)
10" INLET/10" OUTLET PIPELINES (HDPE)
0.50%
EXIST GRADE @ ℄ PIPELINES
STA 129+84.86
AIR RELEASE VALVE (INLET PIPE)
3" COMB AIR VALVE (OUTLET PIPE)
STA 134+00.00
INV ELEV 1615.41
MATCHLINE STA 134+00.00
SEE SHEET C-014
Revised Route
Unsure where diversion occurs
127+50
ask Chris
124+00
125+00
126+00
127+00
128+00
129+00
130+00
131+00
132+00
133+00
134+00
1620.5
1620.3
1621.0
1621.0
1621.8
1622.0
1622.2
1622.5
1622.0
1621.8
1622.2
1622.3
1622.5
1622.6
1622.5
1622.6
1622.3
1622.0
1621.4
1622.0
GRAPHIC SCALE
(IN FEET)
SECTION 31, T21S, R63E
MATCHLINE STA 124+00.00
SEE SHEET C-012
PABCO CHANNEL
R/W
80' ROW
LEAK DETECTION WELL
APN 160-31-801-001
BASIC ENVIRONMENTAL CO LLC
PROPOSED KMG 20' UTILITY EASEMENT
C/L 10" INLET/10" OUTLET PIPELINES (HDPE) (SEE NOTE)
PITTMAN LATERAL
HENDERSON EASEMENT
PROPOSED
ATHENS ROAD
PROPOSED DRAINAGE CHANNEL (BY OTHERS)
PABCO CHANNEL
STA 129+84.86
AIR RELEASE VALVE (INLET PIPE)
3" COMB AIR VALVE (OUTLET PIPE)
6
11
D-002
D-002
LEAK DETECTION WELL
TELEMETRY CABLE
80' ROW
MATCHLINE STA 134+00.00
SEE SHEET C-014
Call before you Dig
PROFESSIONAL ENGINEER - STATE OF NEVADA
RICHARD J CAPP
CIVIL
PROFESSIONAL ENGINEER - STATE OF NEVADA
JAMES J TUCKER
CIVIL
RICHARD J. CAPP RESPONSIBILITY FOR
CONFIDENTIAL
PROPERTY OF KERR-McGEE CORP
MAY NOT BE REPRODUCED, COPIED, OR USED FOR ANY PURPOSE WITHOUT

PAPER SIZE: A

DRAWING NO. C-013

SHEET 17 OF

KERR-McGEE CHEMICAL LLC P.O. BOX 55 HENDERSON, NEV. 89009-7000

DESIGN	DATE	APPROVED FOR CONSTRUCTION	BY	DATE		BY	DATE
DRAWN BY		SAFETY			PROCESS ENGR.		
PROJ. ENGR.		ENVIRONMENTAL			PROJECT ENGR.		
ENGR. MNGR.		OPERATIONS MNGR.			ENGR. MNGR.		
		PRODUCTION SUPT.			PLANT MNGR.		
		QLTY CONTROL					

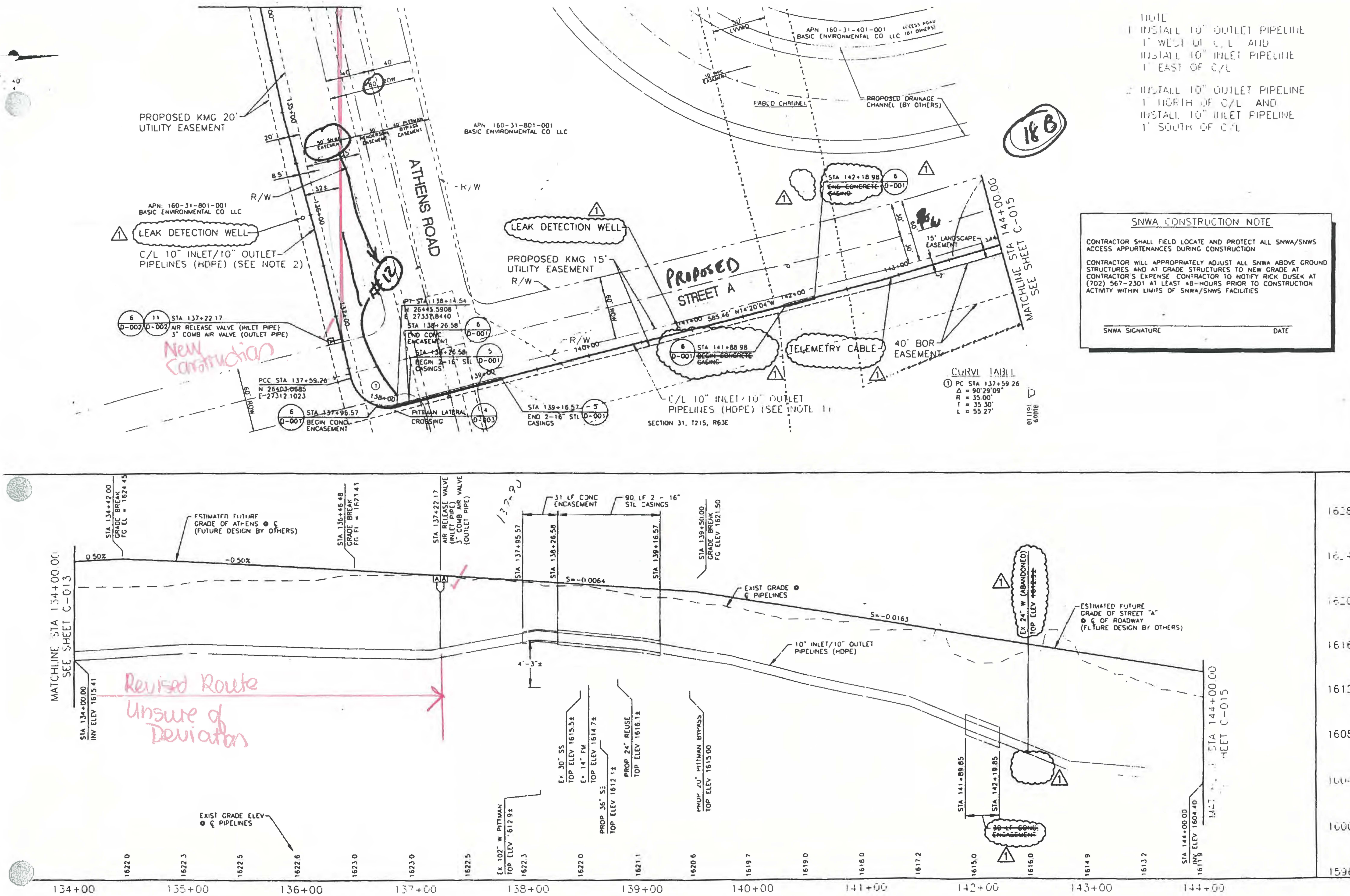
INLET/OUTLET PIPELINES
PLAN + PROFILE
STA 124+00 TO STA 134+00

DATE: SCALE:

AFE No.   JOB No.

REV	DESCRIPTION	BY	DATE
1	RECORD DRAWINGS	CLL	10/1

PBSJ



NOTE
1. INSTALL 10" OUTLET PIPELINE 1' WEST OF C/L AND INSTALL 10" INLET PIPELINE 1' EAST OF C/L
2. INSTALL 10" OUTLET PIPELINE 1' NORTH OF C/L AND INSTALL 10" INLET PIPELINE 1' SOUTH OF C/L
SNWA CONSTRUCTION NOTE
CONTRACTOR SHALL FIELD LOCATE AND PROTECT ALL SNWA/SNWS ACCESS APPURTENANCES DURING CONSTRUCTION.
CONTRACTOR WILL APPROPRIATELY ADJUST ALL SNWA ABOVE GROUND STRUCTURES AND AT GRADE STRUCTURES TO NEW GRADE AT CONTRACTOR'S EXPENSE. CONTRACTOR TO NOTIFY RICK DUSEK AT (702) 567-2301 AT LEAST 48-HOURS PRIOR TO CONSTRUCTION ACTIVITY WITHIN LIMITS OF SNWA/SNWS FACILITIES.
SNWA SIGNATURE
DATE
18B
PROPOSED KMG 20' UTILITY EASEMENT
APN 160-31-801-001 BASIC ENVIRONMENTAL CO LLC
APN 160-31-401-001 BASIC ENVIRONMENTAL CO LLC
PABCO CHANNEL
PROPOSED DRAINAGE CHANNEL (BY OTHERS)
ATHENS ROAD
R/W
LEAK DETECTION WELL
C/L 10" INLET/10" OUTLET PIPELINES (HDPE) (SEE NOTE 2)
PROPOSED KMG 15' UTILITY EASEMENT
PROPOSED STREET A
STA 137+22.17 AIR RELEASE VALVE (INLET PIPE) 3" COMB AIR VALVE (OUTLET PIPE)
New Construction
PCC STA 137+59.26 N 26403.0685 E 27312.1023
STA 137+95.57 BEGIN CONC. ENCASEMENT
PI STA 138+14.54 N 26445.5908 E 27338.8440
STA 138+26.58 END CONC. ENCASEMENT
STA 138+26.58 BEGIN 2-16" STL CASINGS
PITTMAN LATERAL CROSSING
STA 139+16.57 END 2-16" STL CASINGS
STA 141+88.98 BEGIN CONCRETE CASING
STA 142+18.98 END CONCRETE CASING
TELEMETRY CABLE
40' BOR EASEMENT
15' LANDSCAPE EASEMENT
C/L 10" INLET/10" OUTLET PIPELINES (HDPE) (SEE NOTE 1)
SECTION 31, T21S, R63E
MATCHLINE STA 144+00.00 SEE SHEET C-015
CURVE TABLE
1 PC STA 137+59.26 Δ = 90°29'09" R = 35.00' T = 35.30' L = 55.27'
MATCHLINE STA 134+00.00 SEE SHEET C-013
ESTIMATED FUTURE GRADE OF ATHENS @ C (FUTURE DESIGN BY OTHERS)
31 LF CONC ENCASEMENT
90 LF 2 - 16" STL CASINGS
EXIST GRADE @ C PIPELINES
10" INLET/10" OUTLET PIPELINES (HDPE)
ESTIMATED FUTURE GRADE OF STREET "A" @ C OF ROADWAY (FUTURE DESIGN BY OTHERS)
EX 24" W (ABANDONED)
Revised Route
Unsure of Deviation
EXIST GRADE ELEV @ C PIPELINES
30 LF CONC. ENCASEMENT
STA 134+00.00 INV ELEV 1615.41
STA 144+00.00 INV ELEV 1604.40
134+00 135+00 136+00 137+00 138+00 139+00 140+00 141+00 142+00 143+00 144+00
1628 1624 1620 1616 1612 1608 1604 1600 1596
GRAPHIC SCALE

Call before you Dig

RICHARD J. CAPP RESPONSIBILITY FOR THESE PLANS INCLUDES ALL BUBBLED CHANGES AND CHANGES NOTED IN REVISION BLOCK

CONFIDENTIAL PROPERTY OF KERR-McGEE CORP.

RICHARD J. CAPP

PAPER SIZE

DRAWING NO.

SHEET

KERR-MC GEE CHEMICAL LLC

P.O. BOX 55 HENDERSON, NEV. 89009-7000

INLET/OUTLET PIPELINES PLAN + PROFILE STA 134+00 TO STA 144+00

SCALE

DATE

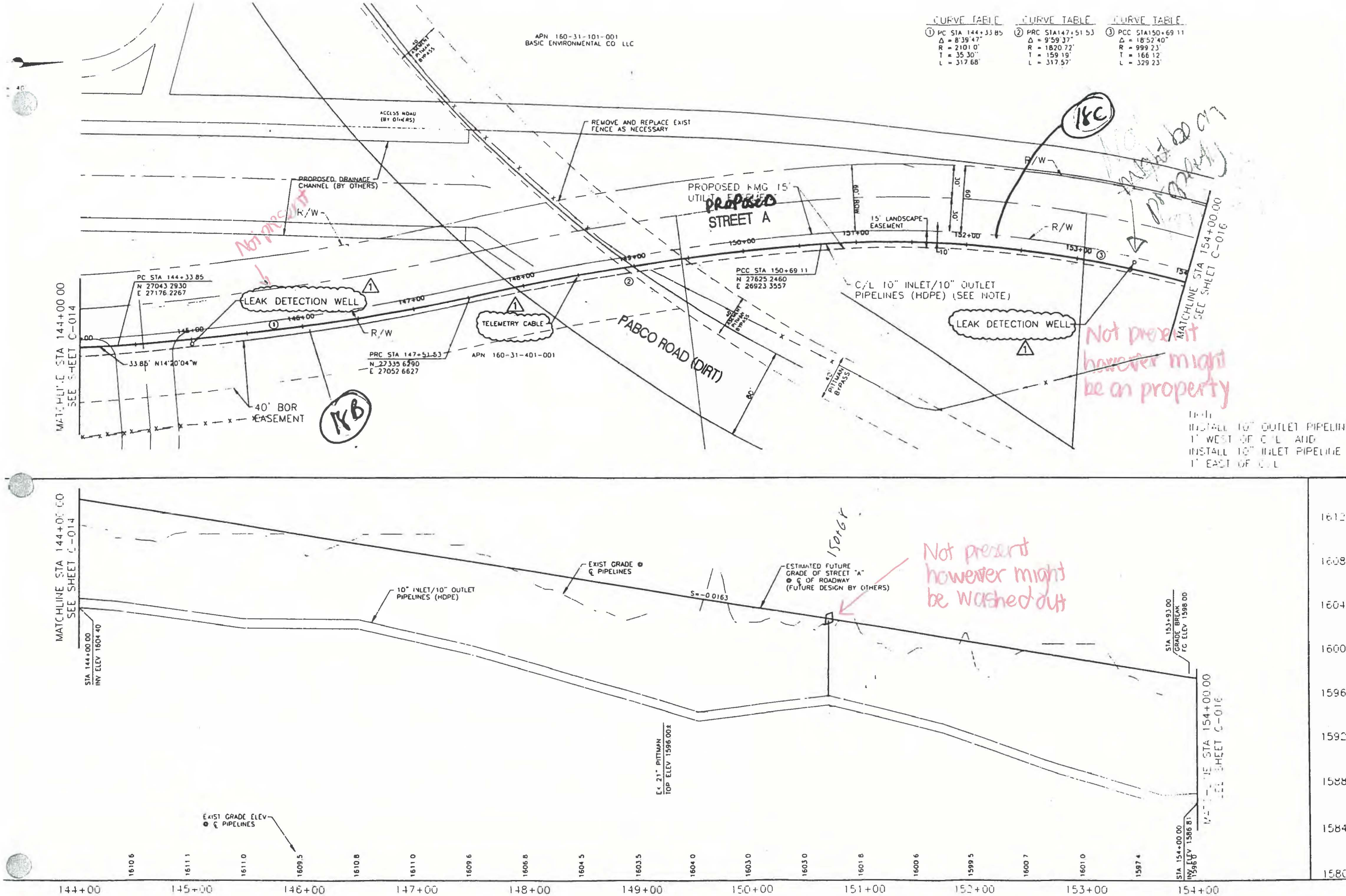
JOB No.

AFE No.

RECORD DRAWINGS

APPROVED FOR CONSTRUCTION

PBS&J


CURVE TABLE
① PC STA 144+33.85 Δ = 8°39'47" R = 2101.0' T = 35.30' L = 317.68'
CURVE TABLE
② PRC STA147+51.53 Δ = 9°59'37" R = 1820.72' T = 159.19' L = 317.57'
CURVE TABLE
③ PCC STA150+69.11 Δ = 18°52'40" R = 999.23' T = 166.12' L = 329.23'
APN 160-31-101-001
BASIC ENVIRONMENTAL CO LLC
ACCESS ROAD (BY OTHERS)
REMOVE AND REPLACE EXIST FENCE AS NECESSARY
PROPOSED DRAINAGE CHANNEL (BY OTHERS)
PROPOSED STREET A
15' LANDSCAPE EASEMENT
PC STA 144+33.85 N 27043.2930 E 27176.2267
LEAK DETECTION WELL
TELEMETRY CABLE
PABCO ROAD (DIRT)
PCC STA 150+69.11 N 27625.2460 E 26923.3557
C/L 10" INLET/10" OUTLET PIPELINES (HDPE) (SEE NOTE)
LEAK DETECTION WELL
PRC STA 147+51.53 N 27335.6290 E 27052.6627
APN 160-31-401-001
33.85' N14°20'04"W
40' BOR EASEMENT
MATCHLINE STA 144+00.00 SEE SHEET C-014
MATCHLINE STA 154+00.00 SEE SHEET C-016
R/W
18B
18C
Not present
Not present however might be on property
Not present however might be washed out
NOTE:
INSTALL 10" OUTLET PIPELINE 1' WEST OF C/L AND INSTALL 10" INLET PIPELINE 1' EAST OF C/L
EXIST GRADE @ C PIPELINES
10" INLET/10" OUTLET PIPELINES (HDPE)
S=-0.0163
ESTIMATED FUTURE GRADE OF STREET "A" @ C OF ROADWAY (FUTURE DESIGN BY OTHERS)
STA 144+00.00 INV ELEV 1604.40
EX 21" PITTMAN TOP ELEV 1596.00±
STA 153+93.00 GRADE BREAK FG ELEV 1598.00
STA 154+00.00 INV ELEV 1586.81
EXIST GRADE ELEV @ C PIPELINES
1610.6 1611.1 1611.0 1609.5 1610.8 1611.0 1609.6 1606.8 1604.5 1603.5 1604.0 1603.0 1603.0 1601.8 1600.6 1599.5 1600.7 1601.0 1597.4
144+00 145+00 146+00 147+00 148+00 149+00 150+00 151+00 152+00 153+00 154+00
1612 1608 1604 1600 1596 1592 1588 1584 1580
GRAPHIC SCALE

Call before you Dig

RICHARD J. CAPP RESPONSIBILITY FOR THESE PLANS INCLUDES ALL BUBBLED CHANGES AND CHANGES NOTED IN REVISION BLOCK

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RICHARD J. CAPP CIVIL — PROFESSIONAL ENGINEER — STATE OF NEVADA

KERR-MC GEE CHEMICAL LLC
P.O. BOX 55 HENDERSON, NEV 89009-7000

INLET/OUTLET PIPELINES
PLAN + PROFILE
STA 144+00 TO STA 154+00

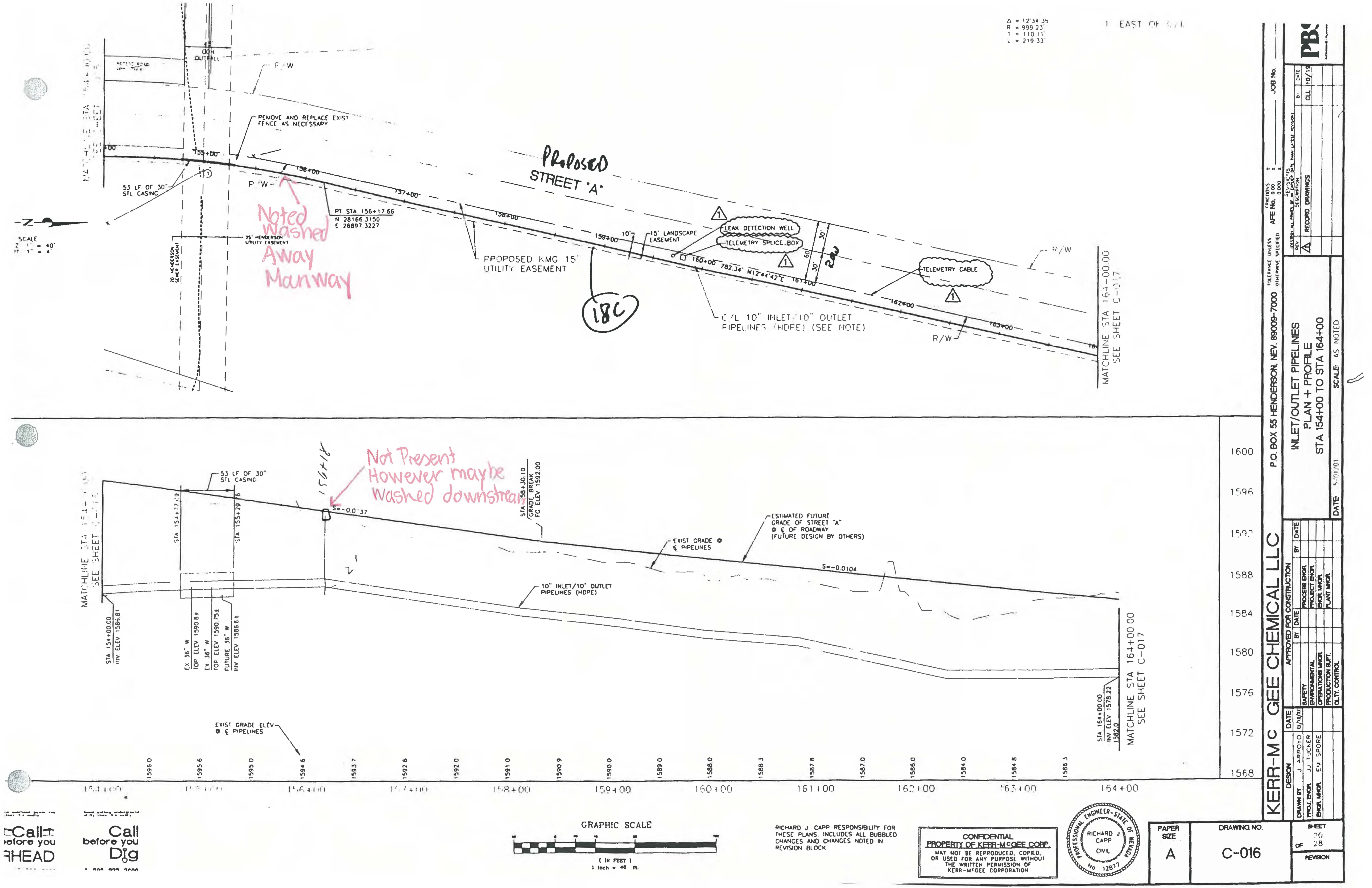
PBS&J

REVISIONS: RECORD DRAWINGS — CLL 10/1?

DESIGN: J. ARPOLLO · DRAWN BY · PROJ. ENGR. JJ TUCKER · ENGR. MNGR. EM SPORE

APPROVED FOR CONSTRUCTION: SAFETY · ENVIRONMENTAL · OPERATIONS MNGR. · PRODUCTION SUPT. · QLTY. CONTROL · PROCESS ENGR. · PROJECT ENGR. · ENGR. MNGR. · PLANT MNGR.

PAPER SIZE: A
DRAWING NO. C-015
SHEET 19 OF 28



Δ = 12°34'35
R = 999.23'
T = 110.11'
L = 219.33'
EAST OF C/L
R/W
REMOVE AND REPLACE EXIST FENCE AS NECESSARY
155+00
156+00
157+00
158+00
159+00
160+00
161+00
162+00
163+00
PROPOSED STREET "A"
53 LF OF 30" STL CASING
PT STA 156+17.66
N 28166 3150
E 26897 3227
Noted Washed Away Manway
25' HENDERSON UTILITY EASEMENT
PROPOSED KMG 15' UTILITY EASEMENT
18C
10'
15' LANDSCAPE EASEMENT
LEAK DETECTION WELL
TELEMETRY SPLICE BOX
782.34' N12°44'42"E
TELEMETRY CABLE
C/L 10" INLET/10" OUTLET PIPELINES (HDPE) (SEE NOTE)
MATCHLINE STA 164+00.00 SEE SHEET C-017
SCALE
Not Present However maybe washed downstream
156+18
53 LF OF 30" STL CASING
STA 158+30.10 GRADE BREAK FG ELEV 1592.00
S=-0.0137
EXIST GRADE @ C PIPELINES
ESTIMATED FUTURE GRADE OF STREET "A" @ C OF ROADWAY (FUTURE DESIGN BY OTHERS)
S=-0.0104
10" INLET/10" OUTLET PIPELINES (HDPE)
STA 154+00.00 INV ELEV 1589.81
EX 36" W TOP ELEV 1590.8±
EX 36" W TOP ELEV 1590.75±
FUTURE 36" W INV ELEV 1586.8±
STA 164+00.00 INV ELEV 1578.22 1582.0
MATCHLINE STA 164+00.00 SEE SHEET C-017
EXIST GRADE ELEV @ C PIPELINES
1600
1596
1588
1584
1580
1576
1572
1568
159+00
160+00
161+00
162+00
163+00
164+00
Call before you Dig
GRAPHIC SCALE
(IN FEET)
1 inch = 40 ft.
RICHARD J. CAPP RESPONSIBILITY FOR THESE PLANS INCLUDES ALL BUBBLED CHANGES AND CHANGES NOTED IN REVISION BLOCK
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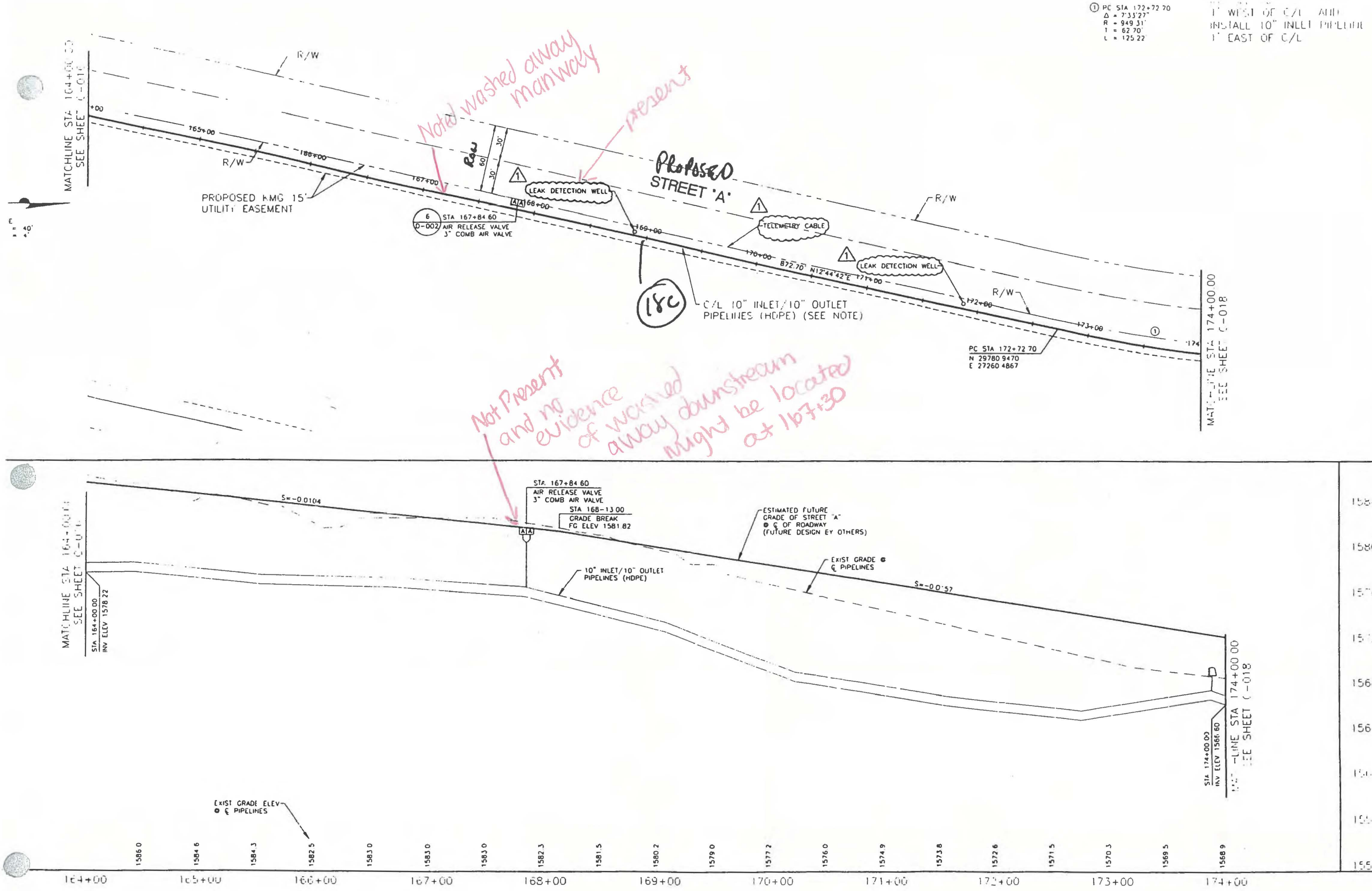
PROFESSIONAL ENGINEER - STATE OF NEVADA
RICHARD J. CAPP
CIVIL
No. 12877
PAPER SIZE A
DRAWING NO. C-016
SHEET 20 OF 28
REVISION
KERR-McGEE CHEMICAL LLC
P.O. BOX 55 HENDERSON, NEV. 89009-7000
INLET/OUTLET PIPELINES
PLAN + PROFILE
STA 154+00 TO STA 164+00
SCALE: AS NOTED
JOB No.
AFE No.
RECORD DRAWINGS
APPROVED FOR CONSTRUCTION
PROCESS ENGR.
PROJECT ENGR.
ENGR. MNGR.
PLANT MNGR.
SAFETY
ENVIRONMENTAL
OPERATIONS MNGR.
PRODUCTION SUPT.
QLTY. CONTROL
DRAWN BY
PROJ. ENGR.
ENGR. MNGR.
DESIGN
J. APPOLO
JJ TUCKER
EM SPORE



① PC STA 172+72.70
Δ = 7°33'27"
R = 949.31'
T = 62.70'
L = 125.22'
1' WEST OF C/L AND INSTALL 10" INLET PIPELINE 1' EAST OF C/L
MATCHLINE STA 164+00.00 SEE SHEET C-016
R/W
PROPOSED KMG 15' UTILITY EASEMENT
6 D-002 STA 167+84.60 AIR RELEASE VALVE 3" COMB AIR VALVE
LEAK DETECTION WELL
PROPOSED STREET "A"
TELEMETRY CABLE
C/L 10" INLET/10" OUTLET PIPELINES (HDPE) (SEE NOTE)
872.70' N12°44'42"E
PC STA 172+72.70
N 29780.9470
E 27260.4867
MATCHLINE STA 174+00.00 SEE SHEET C-018
Noted washed away manway
present
Not Present and no evidence of washed away downstream might be located at 167+30
18C
STA 167+84.60
AIR RELEASE VALVE
3" COMB AIR VALVE
STA 168+13.00
GRADE BREAK
FG ELEV 1581.82
S=-0.0104
S=-0.0157
ESTIMATED FUTURE GRADE OF STREET "A" @ C OF ROADWAY (FUTURE DESIGN BY OTHERS)
EXIST GRADE @ C PIPELINES
10" INLET/10" OUTLET PIPELINES (HDPE)
STA 164+00.00 INV ELEV 1578.22
STA 174+00.00 INV ELEV 1566.60
EXIST GRADE ELEV @ C PIPELINES
1586.0 1584.6 1584.3 1582.5 1583.0 1583.0 1583.0 1582.3 1581.5 1580.2 1579.0 1577.2 1576.0 1574.9 1573.8 1572.6 1571.5 1570.3 1569.5 1568.9
164+00 165+00 166+00 167+00 168+00 169+00 170+00 171+00 172+00 173+00 174+00
1584 1580 1568 1564

Call before you Dig

GRAPHIC SCALE

(IN FEET)

1 inch = 40 ft.

RICHARD J. CAPP RESPONSIBILITY FOR THESE PLANS INCLUDES ALL BUBBLED CHANGES AND CHANGES NOTED IN REVISION BLOCK.

PROFESSIONAL ENGINEER - STATE OF NEVADA
RICHARD J. CAPP
CIVIL
No 12877

KERR-McGEE CHEMICAL LLC

P.O. BOX 55 HENDERSON, NEV 89009-7000

INLET/OUTLET PIPELINES PLAN + PROFILE STA 164+00 TO STA 174+00

PBS&J

REVISIONS: △ RECORD DRAWINGS — CLL 10/19

PAPER SIZE	DRAWING NO.	SHEET
A	C-017	

SCALE 1" = 40'

Future PROPOSED RUSSELL RD

MATCHLINE STA 174+00.00 SEE SHEET C-017

R/W

Proposed STREET "A"

R/W

TELEMETRY CABLE

LEAK DETECTION WELL

PT STA 175+01.94
N 30008.1230
E 27286.6617

PC STA 176+27.19
N 30133.3360
E 27283.6207

PT STA 178+91.60
N 30395.9710
E 27255.9127

5 D-001 STA 179+36.51
BEGIN 30" STL CASING

125.25' N01°30'30"W

156.57' N09°43'01"W

295.85' N09°43'01"W

6 D-002 STA 181+60.81
3" COMB AIR RELEASE VALVE

move to 185+60

PROPOSED 40' UTILITY EASEMENT

STA 181+04.15
~~90° BEND~~ R=25'
N 30543.0220
E 27172.8317

55.97' N19°18'32"W

STA 180+48.18
~~90° BEND~~ R=25'
N 30550.1000
E 27228.3547

STA 180+44.71
END 30" STL CASING 5 D-001

C/L 10" INLET/10" OUTLET PIPELINES (HDPE) (SEE NOTE)

MATCHLINE STA 184+00.00 SEE SHEET C-018

INSTALL 10" OUTLET PIPELINE TO WEST OF C/L AND INSTALL 10" INLET PIPELINE 5' EAST OF C/L

CURVE TABLE

① PT STA 175+01.94
Δ = 6°16'41"
R = 949.31'
T = 52.06'
L = 104.02'

② PC STA 176+27.19
Δ = 9°49'12"
R = 1542.74'
T = 132.53'
L = 264.42'

STA 174+20 AIR RELEASE VALVE

STA 174+50.00
GRADE BREAK
FG ELEV 1571.80

S=-0.0157

ESTIMATED FUTURE GRADE OF STREET "A" @ ℄ OF ROADWAY (FUTURE DESIGN BY OTHERS)

S=-0.0075

108 LF 24" STL CASING

STA 179+36.51

STA 180+44.71

10" INLET/10" OUTLET PIPELINES (HDPE)

EXIST GRADE @ ℄ PIPELINES

STA 174+00.00
INV ELEV 1566.60

STA 181+60.81
AIR RELEASE VALVE
2" COMB AIR VALVE

STA 182+90.00
GRADE BREAK
FG ELEV 1565.50

STA 184+00.00
INV ELEV 1554.16

MATCHLINE STA 184+00.00 SEE SHEET C-018

move to 185+60.

1568.4 1567.9 1567.4 1566.9 1566.6 1566.0 1565.4 1564.2 1562.6 1562.5 1562.8 1563.2 1563.1 1565.5 1566.0 1565.1 1564.6 1564.0 1563.2 1562.0

174+00 175+00 176+00 177+00 178+00 179+00 180+00 181+00 182+00 183+00 184+00

KERR-Mc GEE CHEMICAL LLC
P.O. BOX 55 HENDERSON, NEV. 89009-7000

APPROVED FOR CONSTRUCTION

	BY	DATE
SAFETY		
ENVIRONMENTAL		
OPERATIONS MNGR.		
PRODUCTION SUPT.		
QLTY CONTROL		
PROCESS ENGR.		
PROJECT ENGR.		
ENGR. MNGR.		
PLANT MNGR.		

DESIGN
DRAWN BY
PROJ. ENGR.
ENGR. MNGR.
DATE

TELEPHONE UNLESS OTHERWISE SPECIFIED

AFE No. JOB No.

REV	DESCRIPTION	BY	DATE
1	RECORD DRAWINGS	CLL	10/19

PBS&J

INLET/OUTLET PIPELINES
PLAN + PROFILE
STA 174+00 TO STA 184+00

SCALE

DATE

Call before you DIG

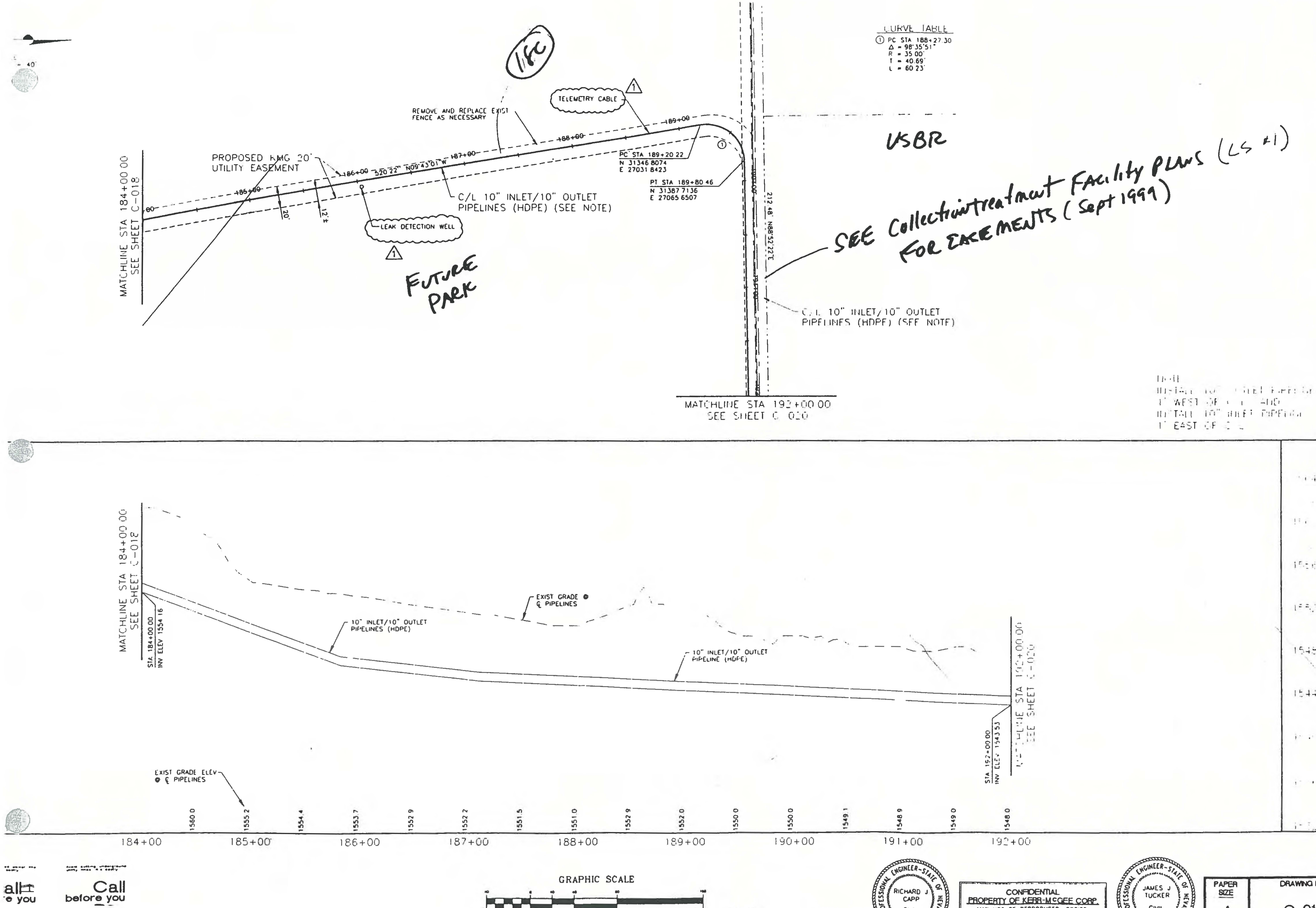
GRAPHIC SCALE
(IN FEET)

RICHARD J. CAPP RESPONSIBILITY FOR THESE PLANS INCLUDES ALL BUBBLED CHANGES AND CHANGES NOTED IN REVISION BLOCK

PROFESSIONAL ENGINEER-STATE OF NEVADA
RICHARD J CAPP
CIVIL

PAPER SIZE	DRAWING NO	SHEET
A	C-018	OF

REVISION


CURVE TABLE
① PC STA 188+27.30
Δ = 98°35'51"
R = 35.00'
T = 40.69'
L = 60.23'
18C
TELEMETRY CABLE
REMOVE AND REPLACE EXIST FENCE AS NECESSARY
PROPOSED BMG 20' UTILITY EASEMENT
S20°22" N09°43'01"W
C/L 10" INLET/10" OUTLET PIPELINES (HDPE) (SEE NOTE)
PC STA 189+20.22
N 31346.8074
E 27031.8423
PT STA 189+80.46
N 31387.7136
E 27065.6507
LEAK DETECTION WELL
USBR
SEE Collection/treatment Facility PLANS (LS #1) FOR EASEMENTS (Sept 1999)
FUTURE PARK
MATCHLINE STA 184+00.00 SEE SHEET C-018
MATCHLINE STA 192+00.00 SEE SHEET C-020
EXIST GRADE @ ℄ PIPELINES
10" INLET/10" OUTLET PIPELINES (HDPE)
10" INLET/10" OUTLET PIPELINE (HDPE)
STA 184+00.00 INV ELEV 1554.16
STA 192+00.00 INV ELEV 1543.53
EXIST GRADE ELEV @ ℄ PIPELINES
1560.0
1555.2
1554.4
1553.7
1552.9
1552.2
1551.5
1551.0
1552.9
1552.0
1550.0
1550.0
1549.1
1548.9
1549.0
1548.0
184+00
185+00
186+00
187+00
188+00
189+00
190+00
191+00
192+00
GRAPHIC SCALE
Call before you dig
CONFIDENTIAL PROPERTY OF KERR-McGEE CORP. MAY NOT BE REPRODUCED, COPIED, OR USED FOR ANY PURPOSE WITHOUT
PROFESSIONAL ENGINEER - STATE OF NEVADA RICHARD J. CAPP CIVIL
PROFESSIONAL ENGINEER - STATE OF NEVADA JAMES J. TUCKER CIVIL

KERR-McGEE CHEMICAL LLC

P.O. BOX 55 HENDERSON NEV 89009-7000

INLET/OUTLET PIPELINES
PLAN + PROFILE
STA 184+00 TO STA 192+00.00

PBS&J

RECORD DRAWINGS — CLL 10/19

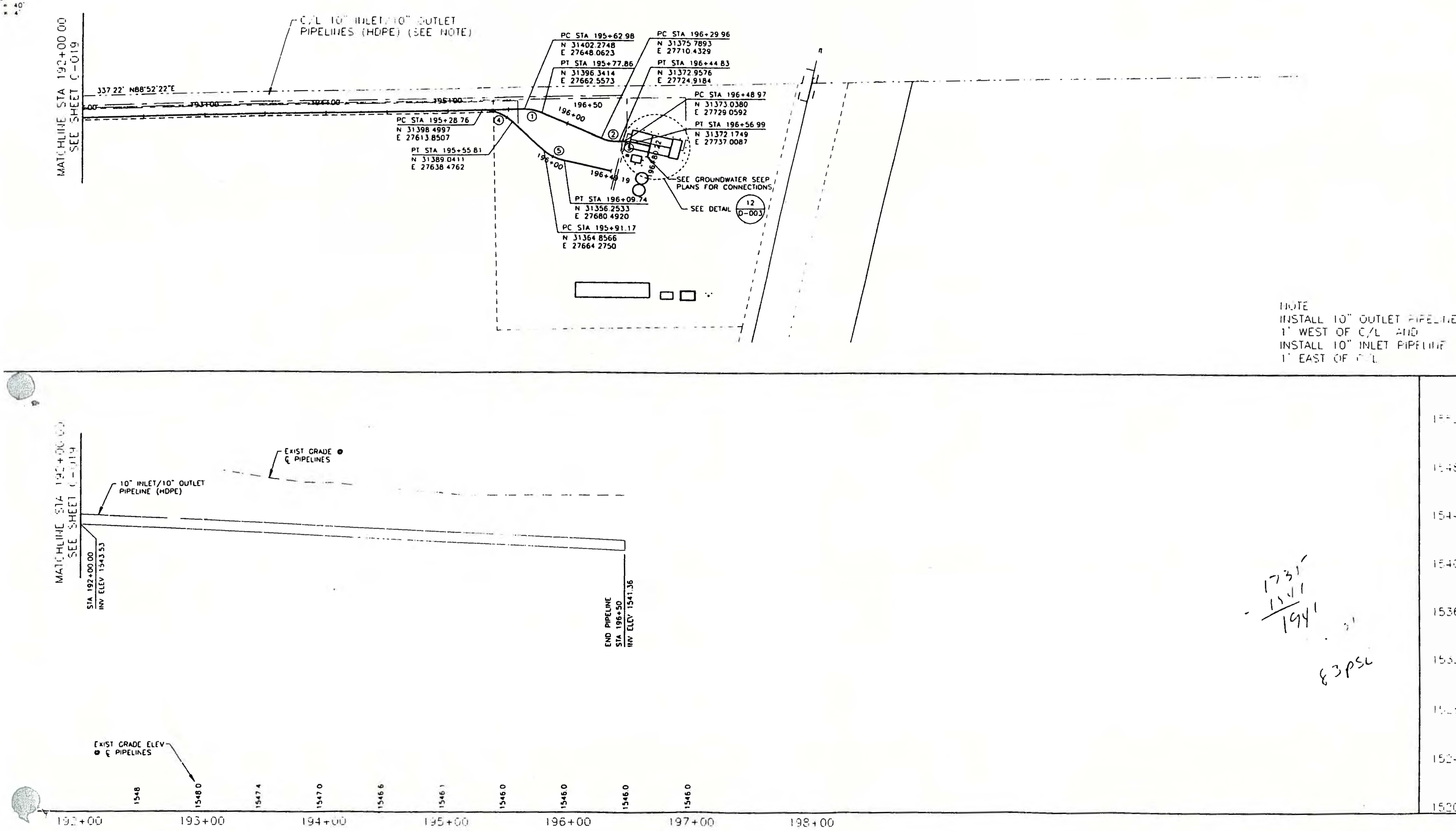
APPROVED FOR CONSTRUCTION

PAPER SIZE: A

DRAWING NO: C-019

	Curve Table ①	Curve Table ②	Curve Table ③	Curve Table ④	Curve Table ⑤
PC STA	195+62.98	196+29.96	196+48.97	195+28.76	195+91.17
Δ	24°21'36"	24°20'41"	13°07'07"	44°16'39"	30°24'28"
R	35.00'	35.00'	35.00'	35.00'	35.00'
T	7.55'	7.55'	4.02'	14.24'	9.51'
L	14.88'	14.87	8.01	27.05'	18.58'

USBR



1731'
-1541
194'
83 psi

NOTE
INSTALL 10" OUTLET PIPELINE 1' WEST OF C/L AND
INSTALL 10" INLET PIPELINE 1' EAST OF C/L

Call before you Dig

GRAPHIC SCALE

RICHARD J. CAPP — PROFESSIONAL ENGINEER — STATE OF NEVADA

CONFIDENTIAL PROPERTY OF KERR-MCGEE CORP.

JAMES J. TUCKER — PROFESSIONAL ENGINEER — STATE OF NEVADA

KERR-McGEE CHEMICAL LLC
P.O. BOX 55 HENDERSON, NEV. 89009-7000

INLET/OUTLET PIPELINE
PLAN + PROFILE
STA 192+00 TO STA 196+92.94

RECORD DRAWINGS

DESIGN: DRAWN BY J. ARROYO; PROJ. ENGR J.J. TUCKER; ENGR. MNGR E.M. SPORE

APPROVED FOR CONSTRUCTION: SAFETY, ENVIRONMENTAL, OPERATIONS MNGR, PRODUCTION SUPT, QLTY CONTROL, PROCESS ENGR, PROJECT ENGR, ENGR. MNGR, PLANT MNGR

JOB No. · AFE No. · SCALE · DATE · PAPER SIZE · DRAWING NO. · SHEET

PBS&J

APPENDIX C
COSTING INFORMATION

Well Field VFD Construction Costs

Item	Sub Item	Sub Item	HP	No of Units	Units	Unit Price	Extended Price
Seep Well Field							
Mobilization	NA	NA	NA	1	Lump sum	$ 5,000	$ 5,000
PC-115R	VFD	Submersible Pump	5	1	Each	$ 3,480	$ 3,480
PC-116R	VFD	Submersible Pump	20	1	Each	$ 4,575	$ 4,575
PC-117	VFD	Submersible Pump	5	1	Each	$ 3,480	$ 3,480
PC-118	VFD	Submersible Pump	5	1	Each	$ 3,480	$ 3,480
PC-119	VFD	Submersible Pump	5	1	Each	$ 3,480	$ 3,480
PC-120	VFD	Submersible Pump	5	1	Each	$ 3,480	$ 3,480
PC-121	VFD	Submersible Pump	5	1	Each	$ 3,480	$ 3,480
PC-133	VFD	Submersible Pump	2	1	Each	$ 3,400	$ 3,400
PC-99R3	VFD	Submersible Pump	5	1	Each	$ 3,480	$ 3,480
VFD Installation	NA	NA	NA	9	Each	$ 1,623	$ 14,607
						Subtotal	$ 52,000
						Contingency (@30%)	$ 16,000
						Contractor OH&P (@ 20%)	$ 10,000
						Engineering and Management (@20%)	$ 10,000
						Total	***$ 88,000***
Athens Road Well Field							
Mobilization	NA	NA	NA	1	Lump sum	$ 5,000	$ 5,000
ART-1	VFD	Submersible Pump	2	1	Each	$ 3,400	$ 3,400
ART-1A	VFD	Submersible Pump	2	1	Each	$ 3,400	$ 3,400
ART-2	VFD	Submersible Pump	3	1	Each	$ 3,440	$ 3,440
ART-2A	VFD	Submersible Pump	3	1	Each	$ 3,440	$ 3,440
ART-3	VFD	Submersible Pump	3	1	Each	$ 3,440	$ 3,440
ART-3A	VFD	Submersible Pump	2	1	Each	$ 3,400	$ 3,400
ART-4	VFD	Submersible Pump	1.5	1	Each	$ 3,400	$ 3,400
ART-4A	VFD	Submersible Pump	1.5	1	Each	$ 3,400	$ 3,400
ART-6	VFD	Submersible Pump	0.75	1	Each	$ 3,360	$ 3,360
ART-9	VFD	Submersible Pump	0.75	1	Each	$ 3,360	$ 3,360
ART-7A	VFD	Submersible Pump	1.5	1	Each	$ 3,400	$ 3,400
ART-7B	VFD	Submersible Pump	1.5	1	Each	$ 3,400	$ 3,400
ART-8	VFD	Submersible Pump	1.5	1	Each	$ 3,400	$ 3,400
ART-8A	VFD	Submersible Pump	1.5	1	Each	$ 3,400	$ 3,400
PC-150	VFD	Submersible Pump	1	1	Each	$ 3,400	$ 3,400
PC-116R	VFD	Submersible Pump	20	1	Each	$ 4,575	$ 4,575
PC-117	VFD	Submersible Pump	5	1	Each	$ 3,480	$ 3,480
PC-118	VFD	Submersible Pump	5	1	Each	$ 3,480	$ 3,480
PC-119	VFD	Submersible Pump	5	1	Each	$ 3,480	$ 3,480
PC-120	VFD	Submersible Pump	5	1	Each	$ 3,480	$ 3,480
PC-121	VFD	Submersible Pump	5	1	Each	$ 3,480	$ 3,480
PC-133	VFD	Submersible Pump	2	1	Each	$ 3,400	$ 3,400
PC-99R3	VFD	Submersible Pump	5	1	Each	$ 3,480	$ 3,480
VFD Installation	NA	NA	NA	15	Each	$ 1,620	$ 24,300
						Subtotal	$ 80,000
						Contingency (@30%)	$ 24,000
						Contractor OH&P (@ 20%)	$ 16,000
						Engineering and Management (@20%)	$ 16,000
						Total	***$ 136,000***

Well Field VFD Construction Costs (continued)

Item	Sub Item	Sub Item	HP	No of Units	Units	Unit Price	Extended Price
Interceptor Well Field							
Mobilization	NA	NA	NA	1	Lump sum	$ 5,000	$ 5,000
I-AA	VFD	Submersible Pump	0.5	1	Each	$ 3,360	$ 3,360
I-AB	VFD	Submersible Pump	0.5	1	Each	$ 3,360	$ 3,360
I-AC	VFD	Submersible Pump	0.5	1	Each	$ 3,360	$ 3,360
I-AD	VFD	Submersible Pump	0.5	1	Each	$ 3,360	$ 3,360
I-A-R	VFD	Submersible Pump	0.5	1	Each	$ 3,360	$ 3,360
I-B	VFD	Submersible Pump	0.5	1	Each	$ 3,360	$ 3,360
I-C	VFD	Submersible Pump	0.5	1	Each	$ 3,360	$ 3,360
I-D	VFD	Submersible Pump	0.5	1	Each	$ 3,360	$ 3,360
I-E	VFD	Submersible Pump	0.5	1	Each	$ 3,360	$ 3,360
I-F	VFD	Submersible Pump	0.5	1	Each	$ 3,360	$ 3,360
I-G	VFD	Submersible Pump	0.5	1	Each	$ 3,360	$ 3,360
I-H	VFD	Submersible Pump	0.5	1	Each	$ 3,360	$ 3,360
I-I	VFD	Submersible Pump	0.5	1	Each	$ 3,360	$ 3,360
I-J	VFD	Submersible Pump	0.5	1	Each	$ 3,360	$ 3,360
I-K	VFD	Submersible Pump	0.5	1	Each	$ 3,360	$ 3,360
I-L	VFD	Submersible Pump	0.5	1	Each	$ 3,360	$ 3,360
I-M	VFD	Submersible Pump	0.5	1	Each	$ 3,360	$ 3,360
I-N	VFD	Submersible Pump	0.5	1	Each	$ 3,360	$ 3,360
I-O	VFD	Submersible Pump	0.5	1	Each	$ 3,360	$ 3,360
I-P	VFD	Submersible Pump	0.5	1	Each	$ 3,360	$ 3,360
I-Q	VFD	Submersible Pump	0.5	1	Each	$ 3,360	$ 3,360
I-R	VFD	Submersible Pump	0.5	1	Each	$ 3,360	$ 3,360
I-S	VFD	Submersible Pump	0.5	1	Each	$ 3,360	$ 3,360
I-T	VFD	Submersible Pump	0.5	1	Each	$ 3,360	$ 3,360
I-U	VFD	Submersible Pump	0.5	1	Each	$ 3,360	$ 3,360
I-V	VFD	Submersible Pump	0.5	1	Each	$ 3,360	$ 3,360
I-W	VFD	Submersible Pump	0.5	1	Each	$ 3,360	$ 3,360
I-X	VFD	Submersible Pump	0.5	1	Each	$ 3,360	$ 3,360
I-Y	VFD	Submersible Pump	0.5	1	Each	$ 3,360	$ 3,360
I-Z	VFD	Submersible Pump	0.5	1	Each	$ 3,360	$ 3,360
VFD Installation	NA	NA	NA	30	Each	$ 1,623	$ 48,690
						Subtotal	$ 154,000
						Contingency (@30%)	$ 46,000
						Contractor OH&P (@ 20%)	$ 31,000
						Engineering and Management (@20%)	$ 31,000
						Total	***$ 262,000***

Lift Station VFD Construction Costs

Item	Sub Item	Sub Item	HP	No of Units	Units	Unit Price	Extended Price
Mobilization	NA	NA	NA	1	Lump sum	$ 5,000	$ 5,000
Lift Station #1	VFD	Vertical Turbine Pumps	40	2	Each	$ 10,310	$ 20,620
Lift Station #2	VFD	Vertical Turbine Pumps	150	2	Each	$ 20,000	$ 40,000
Lift Station #3	VFD	Submersible Pumps	20	2	Each	$ 6,040	$ 12,080
VFD Installation	NA	NA	NA	6	Each	$ 5,000	$ 30,000
						Subtotal	$ 108,000
						Contingency (@30%)	$ 32,000
						Contractor OH&P (@ 20%)	$ 22,000
						Engineering and Management (@ 20%)	$ 22,000
						Total	***$ 184,000***

Lift Station and Effluent Pump Station Pump Replacement Cost Estimates

Item	No of Units	Units	Unit Price	Extended Price
Lift Station No. 1				
Mobilization	1	Lump sum	$ 5,000	$ 5,000
Pump and Pipe Removal	1	Lump sum	$ 10,000	$ 10,000
Pumps	2	Each	$ 23,000	$ 46,000
Valves and Piping	1	Lump sum	$ 5,000	$ 5,000
Installation (Labor, Misc. Tools)	30% of material cost			$ 15,000
Electrical Conduit and Wiring	10% of equipment material/installation			$ 6,000
New Motor Starters	2	Each	$ 10,000	$ 20,000
			Subtotal	$ 107,000
			Contingency (@30%)	$ 32,000
			Contractor OH&P (@ 20%)	$ 21,000
			Engineering and Management	$ 21,000
			Total	***$ 181,000***

Item	No of Units	Units	Unit Price	Extended Price
Lift Station No. 2				
Mobilization	1	Lump sum	$ 5,000	$ 5,000
Pump and Pipe Removal	1	Lump sum	$ 10,000	$ 10,000
Core Drill for New VT Pump	1	Each	$ 5,000	$ 5,000
Pumps	2	Each	$ 30,000	$ 60,000
Valves and Piping	1	Lump sum	$ 5,000	$ 5,000
Installation (Labor, Misc. Tools)	30% of material cost			$ 20,000
Electrical Conduit and Wiring	10% of equipment material/installation			$ 8,000
New Motor Starters	2	Each	$ 10,000	$ 20,000
			Subtotal	$ 133,000
			Contingency (@30%)	$ 40,000
			Contractor OH&P (@ 20%)	$ 27,000
			Engineering and Management (@20%)	$ 27,000
			Total	***$ 227,000***

Item	No of Units	Units	Unit Price	Extended Price
Lift Station No. 3				
Mobilization	1	Lump sum	$ 5,000	$ 5,000
Pump and Pipe Removal	1	Lump sum	$ 10,000	$ 10,000
Pumps	2	Each	$ 18,000	$ 36,000
Valves and Piping	1	Lump sum	$ 5,000	$ 5,000
Installation (Labor, Misc. Tools)	30% of material cost			$ 12,000
Electrical Conduit and Wiring	10% of equipment material/installation			$ 5,000
New Motor Starters	2	Each	$ 10,000	$ 20,000
			Subtotal	$ 93,000
			Contingency (@30%)	$ 28,000
			Contractor OH&P (@ 20%)	$ 19,000
			Enginnering and Management (@20%)	$ 19,000
			Total	***$ 159,000***

Item	No of Units	Units	Unit Price	Extended Price
Effluent Pump Station				
Mobilization	1	Lump sum	$ 5,000	$ 5,000
Pump and Pipe Removal	1	Lump sum	$ 10,000	$ 10,000
Pumps	2	Each	$ 24,000	$ 48,000
Valves and Piping	1	Lump sum	$ 5,000	$ 5,000
Installation (Labor, Misc. Tools)	30% of material cost			$ 16,000
Electrical Conduit and Wiring	10% of equipment material/installation			$ 6,000
New Motor Starters	2	Each	$ 10,000	$ 20,000
			Subtotal	$ 110,000
			Contingency (@30%)	$ 33,000
			Contractor OH&P (@ 20%)	$ 22,000
			Enginnering and Management (@20%)	$ 22,000
			Total	***$ 187,000***

GWTP Capital Cost Estimate, Alternative 1: Bypass GWTP and Update $FeSO_4$ Feed

Item	No of Units	Units	Unit Price	Extended Price
Mobilization	1	Lump sum	$5,000	$5,000
Ferrous sulfate feed pump with automatic flow adjustment	1	Each	$2,000	$2,000
Piping and instrumentaition to bypass existing GWTP	1	Each	$5,000	$5,000
Electronic flowmeter (250-gpm capacity)	1	Each	$2,000	$2,000
Installation (piping and instrumentaiton)	1	Lump sum	$10,000	$10,000
Installation (electrical)	1	Lump sum	$6,000	$6,000
			Subtotal	$30,000
			Contingency (@30%)	$9,000
			Contractor OH&P (@ 20%)	$6,000
			Engineering and Management (@ 20%)	$6,000
			Total	***$51,000***

GWTP Capital Cost Estimate, Alternative 2: Key Equipment Upgrade

Item	No of Units	Units	Unit Price	Extended Price
Mobilization	1	Lump sum	$5,000	$ 5,000
Inclined plate clarifyer (200-gpm capacity) with intergral flash and floc tanks and two mixers	1	Each	$51,000	$ 51,000
Clarifier access platform with ladder, grated steel	1	Each	$20,000	$ 20,000
Polymer blending system	1	Each	$12,000	$ 12,000
Filter press (10-cu.ft. automatic unit with automatic feed pump controls, self-dumping filter cake discharge hopper, and plate for reduced capacity operaiton)	1	Each	$31,000	$ 31,000
Ferrous sulfate chemical feed pump	1	Each	$2,000	$ 2,000
Electronic flowmeter (250-gpm capacity)	1	Each	$2,000	$ 2,000
Air compressor (15-HP, 50-scfm, 2-stage, 120-gal tank)	1	Each	$5,000	$ 5,000
Low head transfer pumps (P-1A and P-1B, 200 gpm @ 30ft, 3 HP)	2	Each	$2,500	$ 5,000
High head transfer pumps (P-4A and P-4B, 200 gpm @ 60ft, 5 HP)	2	Each	$3,000	$ 6,000
Piping and fittings	1	Each	$10,000	$ 10,000
Instrumentation	1	Each	$5,000	$ 5,000
Existing equipment removal and disposal	1	Each	$10,000	$ 10,000
Installation (equipment, piping, and instrumentation)	1	Lump sum	$25,000	$ 25,000
Installation (electrical)	1	Lump sum	$10,000	$ 10,000
Shipping	1	Each	$16,000	$ 16,000
			Subtotal	$ 215,000
			Contingency (@30%)	$ 65,000
			Contractor OH&P (@ 20%)	$ 43,000
			Engineering and Management (@ 20%)	$ 43,000
			Total	***$366,000***

GWTP Capital Cost Estimate, Alternative 3: Entire GWTP Replacement

Item	No of Units	Units	Unit Price	Extended Price
Mobilization	1	Lump sum	$5,000	$5,000
Influent tank (4,200 gallons, 8.5'Dx11'H, heavy duty HDPE)	1	Each	$5,000	$5,000
Low head transfer pumps (P-1A and P-1B, 200 gpm @ 30 ft, 3 HP)	2	Each	$2,500	$5,000
Reaction tank (5,600 gallons, 10'Dx11.5'H, heavy duty HDPE) with Grovhac 1/2-HP electrical paddle mixer	1	Each	$8,000	$8,000
Inclined plate clarifyer (200-gpm capacity) with intergral flash and floc tanks and two mixers	1	Each	$51,000	$51,000
Clarifier access platform with ladder, grated steel	1	Each	$20,000	$20,000
Polymer blending system	1	Each	$12,000	$12,000
Filter press (10-cu.ft. automatic unit with automatic feed pump controls, self-dumping filter cake discharge hopper, and plate for reduced capacity operation)	1	Each	$31,000	$31,000
Air compressor (15-HP, 50-scfm, 2-stage, 120-gal tank)	1	Each	$5,000	$5,000
Double-diaphragm air-driven pump (P-2 and P-3, 1-inch discharge, 50-gpm max flow, 45-scfm air consumption)	2	Each	$2,000	$4,000
Sludge tank (30-deg cone bottom open top, 2,500 gallons, 7.5'Dx10'H, heavy duty HDPE) with stand	1	Each	$5,000	$5,000
Sludge tank top platform with access ladder (grated steel)	1	Each	$10,000	$10,000
Volumetric screw feeder (adjustable rate, 5-cu.ft. hopper, 304S, 0.028 to 2.8 cu.ft./hour feed rate)	1	Each	$9,000	$9,000
Effluent tank (4,200 gallons, 8.5'Dx11'H, heavy duty HDPE)	1	Each	$5,000	$5,000
Ferrous sulfate chemical feed pump	1	Each	$2,000	$2,000
Electronic flowmeter (250-gpm capacity)	1	Each	$2,000	$2,000
High head transfer pumps (P-4A and P-4B, 200-gpm @ 60 ft, 5-HP)	2	Each	$3,000	$6,000
PLC-based control system with HMI and Web access	1	Each	$25,000	$25,000
Piping and fittings	1	Each	$20,000	$20,000
Instrumentation	1	Each	$10,000	$10,000
Existing equipment removal and disposal	1	Each	$70,000	$70,000
Installation (equipment, piping, instrumentaiton)	1	Lump sum	$50,000	$50,000
Installation (electrical)	1	Lump sum	$20,000	$20,000
Shipping	1	Lump sum	$25,000	$25,000
			Subtotal	$ 405,000
			Contingency (@30%)	$ 122,000
			Contractor OH&P (@ 20%)	$ 81,000
			Engineering and Management (@ 20%)	$ 81,000
			Total	***$689,000***

GW-11 Water Balance Instrumentation Capital Cost Estimate

Item	No. of Units	Units	Unit Price	Extended Price
Mobilization	1	Lump sum	$5,000	$ 5,000
Flowmeters - 8-inch diameter				
Flow Meter	2	Each	$5,000	$ 10,000
Pipe Material (Pipe, Flanges, Fittings)	2	Lump sum	$12,000	$ 24,000
Installation (Labor, Misc. Tools)	2	Lump sum	$10,000	$ 20,000
Electrical Conduit and Wiring	2	Lump sum	$7,000	$ 14,000
Flowmeters - 4-inch diameter				
Flow Meter	1	Each	$3,000	$ 3,000
Pipe Material (Pipe, Flanges, Fittings)	1	Lump sum	$9,000	$ 9,000
Installation (Labor, Misc Tools)	1	Lump sum	$10,000	$ 10,000
Electrical Conduit and Wiring	1	Lump sum	$7,000	$ 7,000
GW-11 Stiiling Well and Level				
Pressure Transducer	1	Each	$3,000	$ 3,000
Pipe Material (Pipe, Support)	1	Lump sum	$5,000	$ 5,000
Installation (Labor, Misc. Tools)	1	Lump sum	$7,000	$ 7,000
Electrical Conduit and Wiring	1	Lump sum	$8,000	$ 8,000
			Subtotal	$ 125,000
			Contingency (@30%)	$ 38,000
			Contractor OH&P (@ 20%)	$ 25,000
			PLC Modifications and Programming	$ 52,000
			Subtotal	$ 240,000
			Engineering and Management (@ 20%)	$ 48,000
			Total	***$288,000***

Well Field and Lift Station VFD Payback Estimate Summaries

Pump Designation	Pump Information			Number of Pumps	Rated Flow	Average Flow	Maximum Recorded Flow	HP	kW	Hours Per Year	Annual kWh	Annual Cost ($0.08/kWh)	Annual Flow (gallons)	Average/ Maximum Ratio	Reduced Annual KWH	Reduced Annual kWh Cost	Cost Difference	Total VFD Installation Cost	VFD Payback Period (Years)
	Model Number	Power (HP)	Manufac-turer																
Seep Well Field																			
PC-115R	85S50-3	NA	Grundfos	1	91.5	92.4	105.1	5	3.725	8760	32631	$ 2,610	809,424	0.88	28,688	$ 2,295	$ 315		
PC-116R	150S200-11	20	Grundfos	1	124.8	127.8	153.3	7.5	5.5875	8760	48947	$ 3,916	1,119,528	0.83	40,805	$ 3,264	$ 651		
PC-117	85S50-3	5	Grundfos	1	92.8	103.7	125	5	3.725	8760	32631	$ 2,610	908,412	0.83	27,071	$ 2,166	$ 445		
PC-118	85S50-3	5	Grundfos	1	76.3	76.3	93.7	5	3.725	8760	32631	$ 2,610	668,388	0.81	26,571	$ 2,126	$ 485		
PC-119	85S50-3	5	Grundfos	1	65	65.8	93	5	3.725	8760	32631	$ 2,610	576,408	0.71	23,087	$ 1,847	$ 763		
PC-120	85S50-3	5	Grundfos	1	0	0.2	5	5	3.725	8760	32631	$ 2,610	1,752	0.04	1,305	$ 104	$ 2,506		
PC-121	85S50-3	5	Grundfos	1	0	0.1	1.3	5	3.725	8760	32631	$ 2,610	876	0.08	2,510	$ 201	$ 2,410		
PC-133	TBD	1.5	Grundfos	1	2.2	4.2	4.7	1.5	1.1175	8760	9789.3	$ 783	36,792	0.89	8,748	$ 700	$ 83		
PC-99R3	150S200-11	20	Grundfos	1	58	61.6	87.8	5	3.725	8760	32631	$ 2,610	539,616	0.70	22,894	$ 1,831	$ 779		
				Totals	***568.6***	***593.7***	***756.7***	***64***	***47.68***	***87,600***	***417,677***	***$ 33,414***	***5,200,812***	***NA***	***273,254***	***$ 21,860***	***$ 11,554***	***$ 88,000***	***7.62***
Athens Road Well Field																			
ART-1	40S20-7	2	Grundfos	1	33.0	19.9	23.6	2	1.49	8760	13052	$ 1,044	174,324	0.84	11,006	$ 880	$ 164		
ART-1A	40S20-7	2	Grundfos	1															
ART-2	60S30-5	3	Grundfos	1	71	61.6	62.5	3	2.235	8760	19579	$ 1,566	539,616	0.99	19,297	$ 1,544	$ 23		
ART-2A	60S30-5	3	Grundfos	1															
ART-3	40S20-7	3	Grundfos	1	54	46.1	49.2	1.5	1.1175	8760	9789	$ 783	403,836	0.94	9,172	$ 734	$ 49		
ART-3A	40S20-7	2	Grundfos	1															
ART-4	40S20-7	1.5	Grundfos	1	10	11.5	15.8	1.5	1.1175	8760	9789	$ 783	100,740	0.73	7,125	$ 570	$ 213		
ART-4A	40S20-7	1.5	Grundfos	1															
ART-6	25S07-5	0.75	Grundfos	1	47	49.8	62.4	0.75	0.55875	8760	4895	$ 392	436,248	0.80	3,906	$ 313	$ 79		
ART-9	25S07-5	0.75	Grundfos	1															
ART-7A	40S15-5	1.5	Grundfos	1	32	30.7	31.7	0.75	0.55875	8760	4895	$ 392	268,932	0.97	4,740	$ 379	$ 12		
ART-7B	40S15-5	1.5	Grundfos	1															
ART-8	40S15-5	1.5	Grundfos	1	85	61.7	71.2	5	3.725	8760	32631	$ 2,610	540,492	0.87	28,277	$ 2,262	$ 348		
ART-8A	40S15-5	1.5	Grundfos	1															
PC-150	25S	1	Grundfos	1	0	4.5	4.5	1	0.745	8760	6526	$ 522	39,420	1.00	6,526	$ 522	$ -		
				Totals	***332.0***	***285.8***	***320.9***	***15.5***	***11.5475***	***70,080***	***101,156***	***$ 8,092.49***	***2,503,608***	***NA***	***90,050***	***$ 7,204.02***	***$ 888.47***	***$ 136,000***	***153.07***
Interceptor Well Field																			
I-AA	NA	0.5	Grundfos	1	1.5	0.9	1.4	0.5	0.3725	8760	3263	$ 261	7,884	0.642857143	2,098	$ 168	$ 93		
I-AB	NA	0.5	Grundfos	1	0.2	0	0.4	0.5	0.3725	8760	3263	$ 261	-	0	-	$ -	$ 261		
I-AC	NA	0.5	Grundfos	1	0.2	0	0.1	0.5	0.3725	8760	3263	$ 261	-	0	-	$ -	$ 261		
I-AD	NA	0.5	Grundfos	1	0.2	0	0.4	0.5	0.3725	8760	3263	$ 261	-	0	-	$ -	$ 261		
I-A-R	NA	0.5	TBD	1	1	1	1.6	0.5	0.3725	8760	3263	$ 261	8,760	0.63	2,039	$ 163	$ 98		
I-B	NA	0.5	Grundfos	1	1.5	1.4	1.8	0.5	0.3725	8760	3263	$ 261	12,264	0.78	2,538	$ 203	$ 58		
I-C	NA	0.5	Grundfos	1	6	5.5	7	0.5	0.3725	8760	3263	$ 261	48,180	0.79	2,564	$ 205	$ 56		
I-D	NA	0.5	Grundfos	1	2	1.9	3.3	0.5	0.3725	8760	3263	$ 261	16,644	0.58	1,879	$ 150	$ 111		
I-E	NA	0.5	Grundfos	1	1.5	2.1	2.9	0.5	0.3725	8760	3263	$ 261	18,396	0.72	2,363	$ 189	$ 72		
I-F	NA	0.5	Grundfos	1	5.7	4.4	4.8	0.5	0.3725	8760	3263	$ 261	38,544	0.92	2,991	$ 239	$ 22		
I-G	NA	0.5	Grundfos	1	0.5	0.6	1.1	0.5	0.3725	8760	3263	$ 261	5,256	0.55	1,780	$ 142	$ 119		
I-H	NA	0.5	Grundfos	1	1.2	1	1.5	0.5	0.3725	8760	3263	$ 261	8,760	0.67	2,175	$ 174	$ 87		
I-I	NA	0.5	Grundfos	1	5	4.8	4.9	0.5	0.3725	8760	3263	$ 261	42,048	0.98	3,197	$ 256	$ 5		
I-J	NA	0.5	Grundfos	1	8	5.7	7	0.5	0.3725	8760	3263	$ 261	49,932	0.81	2,657	$ 213	$ 48		
I-K	NA	0.5	Grundfos	1	4	4	5.3	0.5	0.3725	8760	3263	$ 261	35,040	0.75	2,463	$ 197	$ 64		
I-L	NA	0.5	Grundfos	1	2.5	2.1	3.3	0.5	0.3725	8760	3263	$ 261	18,396	0.64	2,077	$ 166	$ 95		
I-M	NA	0.5	Grundfos	1	2.6	2.7	5	0.5	0.3725	8760	3263	$ 261	23,652	0.54	1,762	$ 141	$ 120		

Well Field and Lift Station VFD Payback Estimate Summaries (continued)

Pump Designation	Pump Information			Number of Pumps	Rated Flow	Average Flow	Maximum Recorded Flow	HP	kW	Hours Per Year	Annual kWh	Annual Cost ($0.08/kWh)	Annual Flow (gallons)	Average/ Maximum Ratio	Reduced Annual KWH	Reduced Annual kWh Cost	Cost Difference	Total VFD Installation Cost	VFD Payback Period (Years)
	Model Number	Power (HP)	Manufac-turer																
Interceptor Well Field (continued)																			
I-N	NA	0.5	Grundfos	1	3.5	2	3.2	0.5	0.3725	8760	3263	$ 261	17,520	0.63	2,039	$ 163	$ 98		
I-O	NA	0.5	Grundfos	1	2.5	2.1	3.6	0.5	0.3725	8760	3263	$ 261	18,396	0.58	1,903	$ 152	$ 109		
I-P	NA	0.5	Grundfos	1	3	4.1	6.2	0.5	0.3725	8760	3263	$ 261	35,916	0.66	2,158	$ 173	$ 88		
I-Q	NA	0.5	Grundfos	1	2.5	0.5	1.1	0.5	0.3725	8760	3263	$ 261	4,380	0.45	1,483	$ 119	$ 142		
I-R	NA	0.5	Grundfos	1	2.5	2.8	3.9	0.5	0.3725	8760	3263	$ 261	24,528	0.72	2,343	$ 187	$ 74		
I-S	NA	0.5	Grundfos	1	5	4.3	5.2	0.5	0.3725	8760	3263	$ 261	37,668	0.83	2,698	$ 216	$ 45		
I-T	NA	0.5	Grundfos	1	0.4	0.4	0.7	0.5	0.3725	8760	3263	$ 261	3,504	0.57	1,865	$ 149	$ 112		
I-U	NA	0.5	Grundfos	1	0.8	1	1.5	0.5	0.3725	8760	3263	$ 261	8,760	0.67	2,175	$ 174	$ 87		
I-V	NA	0.5	Grundfos	1	4.8	5.4	5.9	0.5	0.3725	8760	3263	$ 261	47,304	0.92	2,987	$ 239	$ 22		
I-W	NA	0.5	Grundfos	1	1.5	0.7	1.1	0.5	0.3725	8760	3263	$ 261	6,132	0.64	2,077	$ 166	$ 95		
I-X	NA	0.5	Grundfos	1	3	2.9	4.3	0.5	0.3725	8760	3263	$ 261	25,404	0.67	2,201	$ 176	$ 85		
I-Y	NA	0.5	Grundfos	1	3	1.3	1.6	0.5	0.3725	8760	3263	$ 261	11,388	0.81	2,651	$ 212	$ 49		
I-Z	NA	0.5	Grundfos	1	8	6.8	8.8	0.5	0.3725	8760	3263	$ 261	59,568	0.77	2,521	$ 202	$ 59		
				Totals	***84.1***	***72.4***	***98.9***	***15***	***11.175***	***262,800***	***97,893***	***$ 7,831***	***634,224***	***NA***	***61,684***	***$ 4,935***	***$ 2,897***	***$ 262,000***	***90.45***
Lift Stations																			
LS1 VT Pumps	CATM and size 12CHC-4 stages	40	NA	2	975	877.5	NA	40	29.8	8760	261048	$ 20,884	8,541,000	0.90	234,943	$ 18,795	$ 2,088		
LS2 VT Pumps	VIT-CFTM and size 12CHC-5 stages	150	NA	2	1340	1206	NA	150	111.75	8760	978930	$ 78,314	10,564,560	0.90	881,037	$ 70,483	$ 7,831		
LS3 Submersible Pumps	4VCX	20	NA	2	850	765	NA	20	14.9	8760	130524	$ 10,442	6,701,400	0.90	117,472	$ 9,398	$ 1,044		
Effluent Goulds Pump	3196 LTi and size 4x6-10G	200	NA	2	1425	1282.5	NA	200	149	8760	1305240	$ 104,419	11,234,700	0.90	1,174,716	$ 93,977	$ 10,442		
				Totals	***4590***	***4131***	***NA***	***410***	***305.45***	***NA***	***2675742***	***$ 214,059***	***37,041,660***	***NA***	***2,408,168***	***$ 192,653***	***$ 21,406***	***$ 292,000***	***13.64***

APPENDIX D
PROPOSED LIFT STATION PUMP CURVES AND DATA

WATER TECHNOLOGY GROUP
A COGENT COMPANY

To: Tetra Tech

Date: 7/23/15
Quote: PB15-196

ATTN: Caroline Verlander
Reference: Henderson NV Lift Station

Quantity	Description	Price

Myers Quote
Design Points: 850 GPM @ 62' TDH

1 Myers pump model 4VCX submersible water. The unit will be driven by a 20 HP, 460/3/60 explosion proof submersible motor.

1 Discharge Elbow

2 20' sections of stainless steel guide pipe

1 25' sections of stainless steel lifting chain and shackles

1 Stainless steel upper guide bar bracket

Your total net price for the pump, panel & appurtenances listed above------$ 16,233.00

Notes and Clarifications:

1. Equipment sizing and configuration based on the drawings.
2. Taxes are not included in the pricing.
3. Anything not specifically listed above is not included.

Terms: Net 30 days with approved credit
Submittal data: Approx. 4 weeks if required
Delivery: Approx. 12-14 weeks
Freight: FOB factory w/ freight charges allowed
Quote valid: 30 days

Charles Greaves / Peter Botsonis

6345 DOWNING • DENVER, CO 80216
303/ 584-9000 • FAX 303 / 584-9920

WATER TECHNOLOGY GROUP
A COGENT COMPANY

STANDARD TERMS AND CONDITIONS

Price is FOB factory. Price does not include any freight charges. Price does not include any applicable duties or sales tax, use tax, excise tax, value-added or other similar taxes that may apply to this equipment and/or project. Unless specifically stated, price does not include manual or automatic controls, starters, protective or signal devices, wiring, anchor bolts, gauges, vibration isolation devices, installation, startup or testing.

If the price is included in a proposal, the price is firm for receipt of an order within 30 days of the date shown on the proposal. Any additional terms and conditions included in the proposal are specifically included in these terms and conditions.

Payment terms are net 30 days with approved credit. An interest charge of 1-1/2% per month will be added to balances over 30 days. Retainage of any invoiced amount is unacceptable unless specifically agreed to by Company at the time of order, and shall in no case exceed a period of 120 days. If payments are not timely received by Company, and this account is turned over to an attorney for collections, Customer agrees to pay all reasonable costs and attorney fees incurred in collection of the past due amounts.

Payment of "commercial transaction" invoices by credit card will be charged a fee based upon Cogent's average discount rate for credit card transactions for the prior calendar year. This fee will change annually and is currently 2.55%.

All equipment either rented from or through Company is subject to all of the terms and conditions listed on the back of the rental contract. Pricing does not include any overtime running of power equipment.

In no event shall Company's obligations and liabilities under this Agreement include any direct, indirect, punitive, special, incidental or consequential damages or losses that Customer may suffer or incur in connection with this sale, service or rental, including, but not limited to, loss of revenue or profits, damages or losses as a result of Customer's inability to operate, perform its obligations to third persons or injuries to goodwill; nor shall Company's liability extend to damages or losses Customer may suffer or incur as a result of such claims, suits or other proceedings made or instituted against Customer by third parties. Customer remises, releases and discharges Company from any and all liability or damages which might be caused by failure to deliver any equipment within the agreed time by Company.

Customer shall be responsible for determining the good operating condition of all materials and equipment prior to accepting the materials and equipment. NO WARRANTY OR GUARANTEE, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY AS TO MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE IS MADE UNLESS THE SAME IS SPECIFICALLY SET FORTH IN WRITING AND ACCEPTED IN WRITING BY COMPANY, BUT IN SUCH CASE THE WARRANTY OR GUARANTEE IS LIMITED AS ABOVE PROVIDED. Notwithstanding the foregoing, Company will pass through to the Customer any warranty provided by the manufacturer of any equipment supplied by Company.

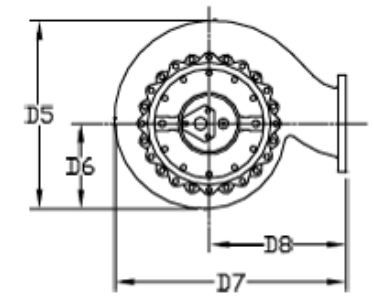
Customer covenants and agrees to defend, indemnify and hold Company harmless from any claims, damages or liability arising out of the use, maintenance or delivery of the equipment or materials purchased or rented hereunder. Customer shall further defend, indemnify and hold Company harmless from any and all damages to third persons or to property caused by Customer's use or possession of the equipment or materials, to the fullest extent allowable by law.

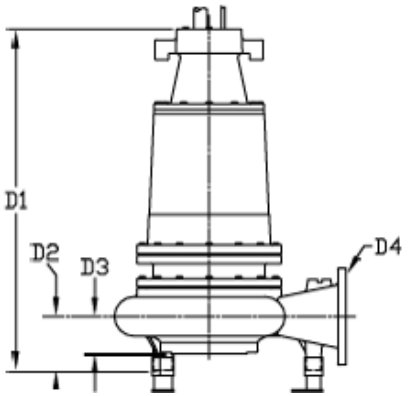
In connection with a proposal, if Customer has any further questions or comments regarding the proposal, please feel free to contact Company. If the proposal meets with Customer's approval, please sign, date and mail or fax a copy of the proposal back to Company's office, and the identified equipment will be ordered and/or scheduled for delivery.

This agreement shall be governed by the laws of the state where the Company's branch office is located from which the equipment is rented or purchased. Customer further agrees that venue and jurisdiction shall be appropriate in the county in which Company's branch office is located from which the equipment was rented or purchased. Any provisions hereof which may prove unenforceable under any law shall not affect the validity of any other provision hereof.

Revised January 2015

6345 DOWNING • DENVER, CO 80216
303/ 584-9000 • FAX 303 / 584-9920





All dimensions are in inches

D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12	D13	D14	D15	D16	D17	D18	D19	D20	D21
38.50		4.13	4.00	18.00	8.50	22.00	13.00													

D22	D23	D24	D25	D26	D27	D28	D29	D30	D31	D32	D33	D34	D35	D36	D37	D38	D39	D40	D41	D42

Motor Data			
Environment	Ordinary	Frame Size	250
Horse Power	20.00 hp	RPM	1,750 rpm
Voltage/Phase	460/3	Hertz	60 Hz
Oil Type	Dielectric transformer	Cord Size	8-4
Cord Length	35 ft	Cord Jacket Matl	W

Pump Data			
Seal Type	Dual Mechanical Seal	O-Ring Matl	Nitrile
Upper Seal Matl	Carbon ceramic - Nitrile	Lower Seal Matl	Carbon ceramic - Nitrile
Impeller Matl	Ductile Iron	Impeller Wear Ring Matl	None
Volute Matl	Cast iron	Volute Wear Ring Matl	None
Discharge Orientation	Horizontal discharge	Discharge Configuration	Flanged discharge
Pump Coating Matl	Green air dry enamel		

General Data			
GPM	850.0 USgpm	Liquid Temperature	0.00 deg F
TDH	62.00 ft	Specific Gravity	1.000 SG
Solid Handling Size	3.19 in	pH	0
Impeller Diameter	0	Viscocity	1.00 cP
Rail System	None	Wet Well Depth	0

Estimated Weights			
Pump	0	Driver	0
Base	0	Accessories	0
		Total	0

Pump Flanges				
Flange	**Size**		**Rating**	**Facing**
Suction	0		0	0
Discharge	0		0	0
Flange	**"X" Force**	**"Y" Force**	**"Z" Force**	**Resultant Force**
Suction	0	0	0	0
Discharge	0	0	0	0
Flange	**"X" Moment**	**"Y" Moment**	**"Z" Moment**	**Resultant Moment**
Suction	0	0	0	0
Discharge	0	0	0	0

Notes:

1. All dimensions are in inches

-

Certification Correct			
Customer			
Customer Quote #			
Job Name	-		
Market	-		
Pump Size	Myers - 4VC/4VCX		
PENTAIR		**Item #**	**004**
		Date Drawn	**-**
		Date Approved	**-**
-			-
			-

Customer :
Project name : Default

Pump Performance Datasheet

Encompass 2.0 - 15.2.1.0

Item number	: 004	Size	: Myers - 4VC/4VCX
Service	:	Stages	: 1
Quantity	: 1	Based on curve number	: SUB_S_E_AH_00027_E_4 Rev 2012-03-23
Quote number	: 353586	Date last saved	: 23 Jul 2015 3:18 PM

Operating Conditions

Flow, rated	: 850.0 USgpm
Differential head / pressure, rated (requested)	: 62.00 ft
Differential head / pressure, rated (actual)	: 61.88 ft
Suction pressure, rated / max	: 0.00 / 0.00 psi.g
NPSH available, rated	: Ample
Frequency	: 60 Hz

Performance

Speed, rated	: 1,750 rpm
Impeller diameter, rated	: 9.38 in
Impeller diameter, maximum	: 12.00 in
Impeller diameter, minimum	: 8.00 in
Efficiency	: 73.64 %
NPSH required / margin required	: - / 0.00 ft
nq (imp. eye flow) / S (imp. eye flow)	: N/A Metric units
Minimum Continuous Stable Flow	: 234.4 USgpm
Head, maximum, rated diameter	: 94.43 ft
Head rise to shutoff	: 52.61 %
Flow, best eff. point (BEP)	: 929.7 USgpm
Flow ratio (rated / BEP)	: 91.43 %
Diameter ratio (rated / max)	: 78.13 %
Head ratio (rated dia / max dia)	: 46.75 %
Cq/Ch/Ce/Cn [ANSI/HI 9.6.7-2010]	: 1.00 / 1.00 / 1.00 / 1.00
Selection status	: Acceptable

Liquid

Liquid type	: Water
Additional liquid description	:
Solids diameter, max	: 0.00 in
Solids concentration, by volume	: 0.00 %
Temperature, max	: 68.00 deg F
Fluid density, rated / max	: 1.000 / 1.000 SG
Viscosity, rated	: 1.00 cP
Vapor pressure, rated	: 0.34 psi.a

Material

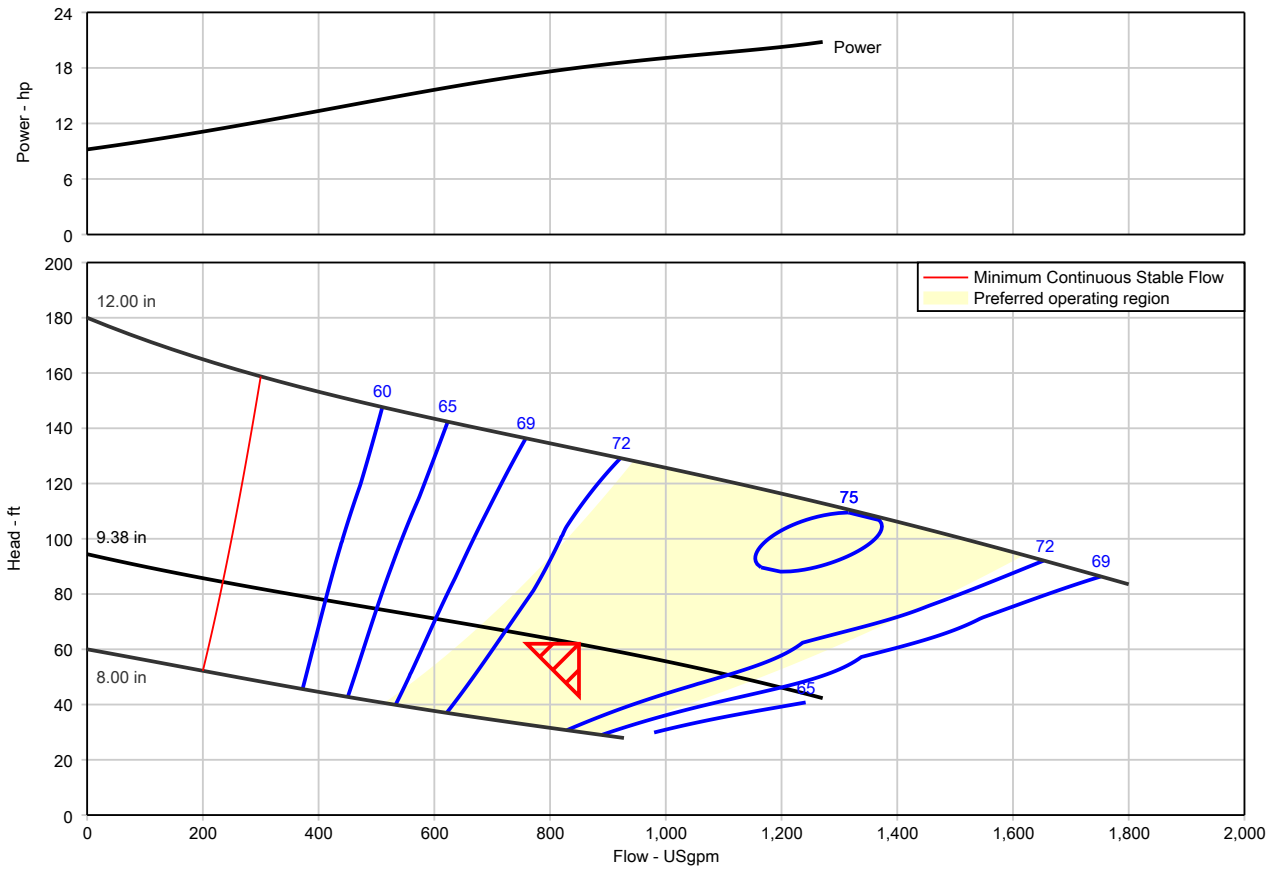
Material selected	: Standard

Pressure Data

Maximum working pressure	: 40.87 psi.g
Maximum allowable working pressure	: N/A
Maximum allowable suction pressure	: N/A
Hydrostatic test pressure	: N/A

Driver & Power Data

Driver sizing specification	: Rated power
Margin over specification	: 0.00 %
Service factor	: 1.00
Power, hydraulic	: 13.28 hp
Power, rated	: 18.03 hp
Power, maximum, rated diameter	: 20.81 hp
Minimum recommended motor rating	: 20.00 hp / 14.91 kW



WATER TECHNOLOGY GROUP
6345 DOWNING · DENVER, COLORADO 80216
PHONE: · FAX:

DXP/Quadna
14452 W 44th Ave
Golden, CO 80403

Attention: **Caroline Verlander**

July 22, 2015
9001-150722-027 - 0

Thank you for your inquiry. Please find enclosed our quotation for your review and acceptance.

Please let me know if you have any questions or require any further clarification.

Respectfully,

Chad Post

External Goulds
303-215-4981
cpost@quadna.com

xylem
Let's Solve Water

QUOTATION

Quote Number: 9001-150722-027

DXP/Quadna
14452 W 44th Ave
Golden, CO 80403

July 22, 2015

Terms: FCA

Job:

We are pleased to quote you for the following equipment, subject to Xylem approval and acceptance of Xylem terms and conditions of sale. Quantities are not guaranteed and should be verified, with any Prices adjusted, prior to placing an order. This quotation is subject to change without notice and void after August 21, 2015.

Item #	Qty	Description	
1	1	**VIT - Short Set Lineshaft Turbine Pumps** Lineshaft Turbine: Open Lineshaft, 12CHC/4-Stage, VIT-CATM	**$21,052.00**
		2,241.00 (lb) wt.	
1.1	1	**Bowl Assembly** 12CHC / 4-STG / Manufacturer's Standard	
		635.00 (lb) wt.	
1.2	1	**Column Assembly** 8" x 1.19" Threaded W/L Column	
		555.00 (lb) wt.	
1.3	1	**Discharge Head Assembly** 6" x 12.0" CA Head	
		335.00 (lb) wt.	
1.4	1	**Driver Assembly** TECO VHS 40 HP 1800 RPM 324TP	
		716.00 (lb) wt.	
1.5	1	**Tests and Services** Hydrostatic Testing (Non-Witness): Bowl Performance Testing (Non-Witness): Lab Motor, Bowl Assembly	
		(lb) wt.	
2	1	**VIT - Short Set Lineshaft Turbine Pumps** Lineshaft Turbine: Open Lineshaft, 12CHC/5-Stage, VIT-CFTM	**$27,080.00**
		3,929.00 (lb) wt.	
2.1	1	**Bowl Assembly** 12CHC / 5-STG / Manufacturer's Standard	
		759.00 (lb) wt.	
2.2	1	**Column Assembly** 8" x 1.50" Threaded W/L Column	
		555.00 (lb) wt.	

xylem
Let's Solve Water

QUOTATION

Quote Number: 9001-150722-027

Item #	Qty	Description	
2.3	1	**Discharge Head Assembly** 8" x 16.5" CF Head **540.00 (lb) wt.**	
2.4	1	**Driver Assembly** GE VHS 150 HP 1800 RPM L444TP **2,075.00 (lb) wt.**	
2.5	1	**Tests and Services** Hydrostatic Testing (Non-Witness): Bowl Performance Testing (Non-Witness): Lab Motor, Bowl Assembly **(lb) wt.**	
		Total Quotation Net Price USD	**$48,132.00**
		Total Weight (lb) **6,170.00**	

TURBINE SUBMITTAL

Quote Number: 9001-150722-027:1
Model: VIT-CATM
Size: 12CHC 4 Stage(s)

OPERATING CONDITIONS

Temp / SG	70° F / SP.GR 1.00
Fluid Type	Water
Lubrication Method	Water (Open Lineshaft)
Vapor Pressure	0.3633 psi
Viscosity	0.9695 cP
Specified Flow	975.00 USGPM
Total Dynamic Head	306.00 ft
Pumping Level	1.000 ft
TPL	0.000 ft
Sump/Pit Depth	20.000 ft
Documentation	Standard pump installation and operation manual and order data

PERFORMANCE AT 1770 RPM

Bowl Efficiency	88.30 @design, 88.90 Best Efficiency
Run Out Capacity	1800.00 USGPM
Power	85.00 @design, 101.00 NOL (Hp)
Npshr	12.10 ft @design
Design Thrust	2594.50 @design (lb)
Shut off Pressure	150.20 psi

MATERIALS AND DIMENSIONS

Bowl	Cast iron with glass enamel		
Suction Bell	Cast Iron CL30		
Bowl Wear Ring	Not Included		
Impeller	316SS		
Impeller Diameter	8.3100 inch		
Impeller Wear Ring	Not Included		
Impeller Balance	Manufacturer's Standard		
Impeller Lock Method	Taper lock	Key Material	None
Bowl Shaft	416SS, 1.6875 inch diam.		
Suction Bearing	Bronze C90300 "G" Modified		
Bowl Bearings	Bronze C90300 "G" Modified		
Rifled Drill Shaft	No		
Collets	Carbon steel		
Strainer Type	None Not Included		
Tube Bearing Adapter Material	Not Included		
Column	Carbon Steel,8" [203mm] (in) diam., 14.39 ft , Threaded		
Column Shaft Diameter	416SS, 1.1875 (in) diam.		
Column Bearing Retainer	304SS		
Lineshaft Bearings	Rubber EPDM		
Column Bearing Options	Not Included		
Max Bearing Space	10 ft (3 m) Spacing		
Lineshaft Coupling	416SS		

DO NOT USE FOR CONSTRUCTION UNLESS CERTIFIED	
Certified by	
Date of certification	
Pump serial number	
Project Name	
Tag:	

Column Shaft Sleeve	Not Included
Tube Material	Carbon Steel
Discharge Head	Cast Iron CL30
Discharge Head Style	CA
Discharge Flange	8 (in), 125#
Head Shaft Coupling	CS Type AR Rigid
Steel Sub Base	Not Included
150# Disch Companion Flange	Not Included
300# Disch Convenience Flange	Not Included
Head Bolting	Carbon steel
Head Sleeve	None
Thrust Pot	Not Required
Sealing Method	Mechanical Seal
Packing	
Mechanical Seal	John Crane 5610 XF551058H

DRIVER INFORMATION

Motor Type	
Motor Manufacturer	TECO
Rating	40 Hp
Efficiency Level	
Motor Part Number	TN0401812119
Enclosure	WP1
Phase / Frequency / Volts	3 / 60 Hz / 230/460
Speed	1800 RPM

TESTING

Hydrostatic:	Hydrostatic Testing (Non-Witness): Bowl
Performance:	Performance Testing (Non-Witness): Lab Motor, Bowl Assembly
Vibration:	None
NPSH:	None
Post Inspection:	None
Final Inspection:	None
Other:	None

COATING

Coating Information:	Goulds Water Technology Standard Blue Enamel; Bowl Assembly - STD; Column Assembly - STD; Head Assembly - STD

ADDITIONAL FEATURES

Additional Bowl Features	
Additional Column Features	
Additional Head Features:	
Additional Driver Features:	

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Pump serial number	
Project Name	
Tag:	

Additional Can features:	
Additional Misc features:	

WEIGHTS

Total bowl weight	635 lbs
Total column weight	555 lbs
Discharge head weight	335.00 lbs
Driver weight	716.00 lbs
Approximate net weight	2241.00 lbs

Our offer does not include specific review and incorporation of any Statutory or Regulatory Requirements and the offer is limited to the requirements of the design specifications. Should any Statutory or Regulatory requirements need to be reviewed and incorporated then the Customer is responsible to identify those and provide copies for review and revision of our offer.

Our quotation is offered in accordance with our comments and exceptions identified in our proposal and governed by our standard terms and conditions of sale – Xylem Americas attached hereafter.

For units requiring performance test, all performance tests will be conducted per ANSI/HI 14.6 standards unless otherwise noted in the selection software submittal documents. Test results meeting with grade 2B tolerances for pumps with a rated shaft power of 134HP or less and grade 1B for greater than 134HP will be considered passing.

Customer is responsible for verifying that the recommendations made and the materials selected are satisfactory for the Customer's intended environment and Customer's use of the selected pump. Customer is responsible for determining the suitability of Xylem recommendations for all operating conditions within Customer's and/or End User's control. Xylem disclaims all warranties, express or implied warranties, including, but not limited to, warranties of merchantability and fitness for a particular purpose and all express warranties other than the limited express warranty set forth in the attached standard terms and conditions of sale – Xylem Americas attached hereafter.

Xylem does not guarantee any pump intake configuration. The hydraulic and structural adequacies of these structures are the sole responsibility of the Customer or his representatives. Further, Xylem accepts no liability arising out of unsatisfactory pump intake field operating conditions.

The Customer or his representatives are referred to the Hydraulic Institute Standards for recommendations on pump intake design. To optimize the hydraulic design of a field pump intake configuration, the Customer should strongly consider performing a detailed scale model pump intake study. However, the adequacies of these recommendations are the sole responsibility of the Customer.

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GOULDS WATER TECHNOLOGY a xylem brand

HYDRAULIC ANALYSIS

Quote Number: 9001-150722-027
Model: VIT-CATM
Size: 12CHC 4 Stage(s)

OVERALL PUMP PARAMETERS

Capacity:	975.00 USGPM	Total Dynamic Head:	306.00 ft
Total Pump Length:	0.000 ft	Impeller Trim:	8.3100 inch
Pump Type:	VIT - Short Set Lineshaft Turbine Pumps	Head Type:	Type CA (Cast Iron A-Head)
Pump K-Factor:	7.5000 lbs/ft	Number of Stages:	4
Additional Pump K-Factor:	7.5000 lbs/ft	Pumping Level:	1.000 ft
Pump Operating Speed [RPM]:	1770		

LINE SHAFT RELATED DATA

Shaft Diameter:	1.1875 inch	Shaft Limit :	125 Hp
Shaft Material:	416SS	Material Correction Fact:	1.18
Line Shaft Length:	172.64 inch	Shaft Elongation:	0.01228 inch
Line Shaft Type:	Water (Open Lineshaft)	Impeller Running Clearance:	0.13 inch

BOWL DATA

Total Bowl Length:	59.36 inch	Bowl Shaft Limit:	371 Hp
Bowl Shaft Diameter:	1.6875 inch	Bowl Shaft Material:	416SS
Bowl Diameter:	11.750 inch		

COLUMN DATA

Column Diameter [in]:	8	Column Elongation:	0.00177 inch
Column Wall Thickness:	0.320 inch	Shut Off Column Elongation:	0.00201 inch
Column Load:	2808.80 lb		

HORSEPOWER DATA

Shaft Friction Loss:	0.10419 Hp	Thrust Load Loss:	0.32343 Hp
Bowl Hp at Design:	85 Hp	Motor Hp:	40 Hp

OTHER DATA

Hydraulic Thrust:	2294.80 lb	Thrust at Design:	2594.50 lb
Thrust at Shut Off:	2921.52 lb	Actual Head Above Grade:	304.19 ft
Available Lateral:	1.00 inch	Design Lateral:	0.14051 inch
Shut Off Lateral:	0.14274 inch		
Suction Head:	0.00 ft	Shut Off Discharge Pressure:	150.20 psi
Column Loss:	0.37 ft	NPSHa:	48.21 ft
Head Loss:	0.44 ft	NPSHr:	12.10 ft @design
Total Loss:	0.81 ft	NPSH Margin:	2.00 ft

EFFICIENCY DATA

Bowl Efficiency:	88.90 %	Overall Efficiency:	81.50 %
Motor Efficiency:	93.00 %	KWH per 1000 gallons:	1.18
Pump Efficiency:	87.60 %		

FLUID DATA

Fluid Type:	Water	Specific Gravity:	0.9999
Temperature:	70°F	Viscosity:	0.9695 cP

COMPONENT WEIGHTS

Bowl Weight:	635 lbs	Column Weight:	555 lbs
Head Weight:	335 lbs	Can Weight:	0 lbs
Driver Weight:	716 lbs	Total Pump Weight:	2241 lbs

DO NOT USE FOR CONSTRUCTION UNLESS CERTIFIED	
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Pump serial number	
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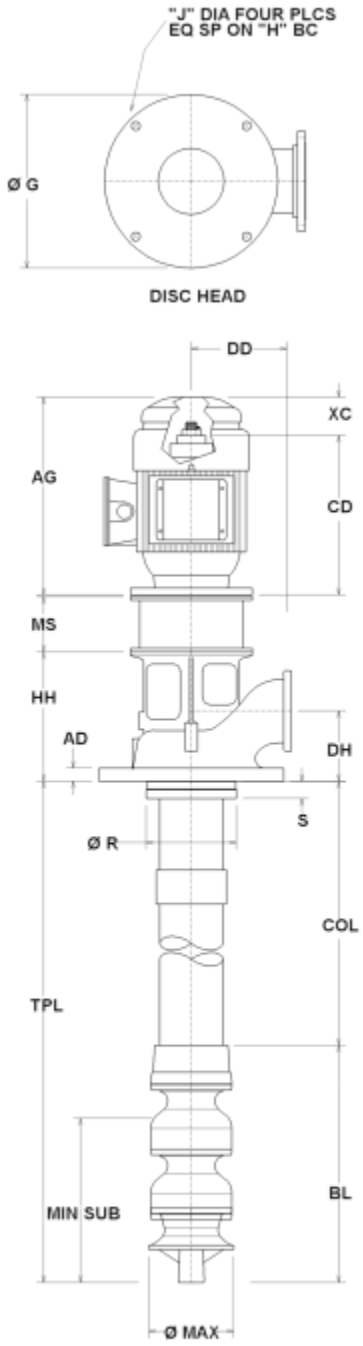
OUTLINE DRAWING

Quote Number: 9001-150722-027
Model: VIT-CATM
Size: 12CHC 4 Stage(s)



DIMENSIONS

AD	1.00	inch
AG	32.71	inch
BD	12.0	inch
BL	59.36	inch
CD	28.22	inch
CL	0.00	inch
COL	172.68	inch
DD	12.00	inch
MIN SUB	23.87	inch
DH	6.75	inch
G	23.50	inch
H	21.25	inch
HH	15.50	inch
J	0.75	inch
L	0.00	inch
M		
R	10.25	inch
S	1.81	inch
SU	0.00	inch
SUT	0.00	inch
TUBE	0.00	inch
TPL	0.00	inch
UG	0.00	inch
V	0.00	inch
W	0.00	inch
X	0.00	inch
XC	4.49	inch
Y	0.00	inch
Z	0.00	inch
Max Dia	11.75	inch
Discharge	(125 #) 8	inch
Suction	(150 #) 8	inch

Weights

Total bowl	635.00	lb
Total column	555	lb
Discharge head	335.00	lb
Driver	716.00	lb
Approx weight	2241.00	lb

PUMP DATA

No. of Units	1.00
Model:	VIT-CATM 12CHC
Stages:	4
Col Size:	8" [203mm]
Shaft:	1.1875 in dia
Flow:	975.00 USGPM
Head:	306.00 ft
Driver Mfr:	TECO
Driver Type:	VHS
Size:	40 Hp
Speed:	1800 RPM
Phase:	3
Frequency:	60 Hz
Voltage:	230/460

No.	NOTES
1	*Total Pump Length ± 1.0 inch.*
2	*Tolerance on all dimensions is .12 or ± .12 inch per 5 ft, whichever is greater.*
3	*All dimensions shown are in inches unless otherwise specified.*
4	*Drawing not to scale.*
5	*½" NPT – Gauge Conn (plugged)*
6	*Driver may be rotated at 90º intervals about vertical centerline for details refer to driver dimension drawing.*
7	*Before starting pump, impeller must be lifted 0.19 inch.*
8	*This assembly has been designed so that its natural frequency responses avoid the specific operating speeds by an adequate safety margin. The design has assumed the foundation to be rigid.*

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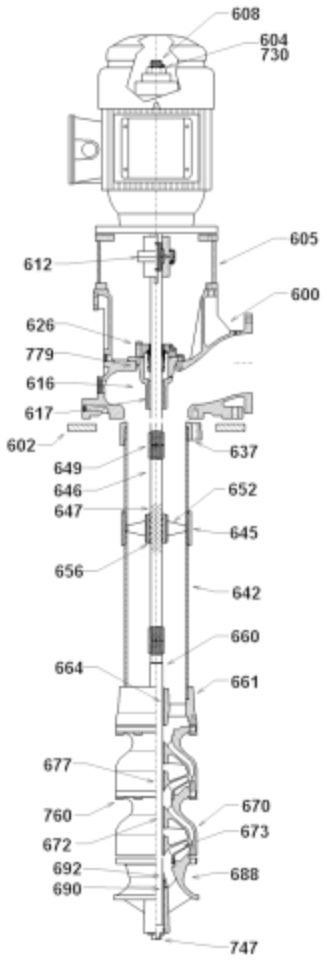
CROSS SECTIONAL

Quote Number: 9001-150722-027:1
Model: VIT-CATM
Size: 12CHC 4 Stage(s)

BILL OF MATERIAL

ITEM	Part Name	CODE	MATERIAL	ASTM#
Discharge Head Assembly				
600	Head – Discharge	1003	Cast Iron CL30	A48-94ae1
602	Head – Base Plate	N/A	Not Included	N/A
604	Nut – Adjusting	2242	Carbon Steel 1018	A108-99
608	Headshaft	2227	416SS	A582M-95b
616	Housing	1003	Cast Iron CL30	A48-94-ae1
617	Bearing-Housing	1109	Bronze C90300 "G" Modified	B584-00
626	Seal	0000	John Crane 5610 XF551058H	
730	Key – Motor GIB	2242	Carbon Steel 1018	A108-99
779	Gasket – Housing	5136	Acrylic/Nitrile	5136 Rev 4
Column and Lineshaft Assembly				
637	Hanger Flange	1003	Cast Iron CL30	A48-94ae1
642	Column Pipe	9645	Carbon Steel	A53
645	Column-Coupling	9645	Carbon Steel	A53
646	Lineshaft	2227	416SS	A582M-95b
649	Lineshaft Coupling	2265	416SS	A582M-95b
652	Retainer-Bearing	1205	304SS	A744M-00
656	Lineshaft Bearing	5121	Rubber EPDM	D3568-98
Bowl Assembly				
660	Bowl-Shaft	2227	416SS	A582M-95b
664	Bearing – Disc Bowl	1109	Bronze C90300 "G" Modified	B584-00
670	Bowl-Inter	6911	Cast Iron CL30 Enamel	A48-94e1
672	Bearing-Int Bowl	1109	Bronze C90300 "G" Modified	B584-00
673	Impeller	1203	316SS	A744M-00
677	Collet-Impeller	2242	Carbon steel	A108-99
674	Key-Impeller	N/A	None	N/A
680	Wear Ring-Bowl	N/A	Not Included	N/A
681	Wear Ring-Impeller	N/A	Not Included	N/A
688	Bowl/Bell-Suction	1003	Cast Iron CL30	A48-94e1
690	Bearing-Suction	1109	Bronze C90300 "G" Modified	B584-00
692	Sandcollar	1205	304SS	A744M-00
698	Strainer Type	N/A	None	N/A
747	Plug-Pipe	1046	Malleable Iron	A197
760	Capscrew-Hex	2298	Steel Bolting Gr8	J429-99



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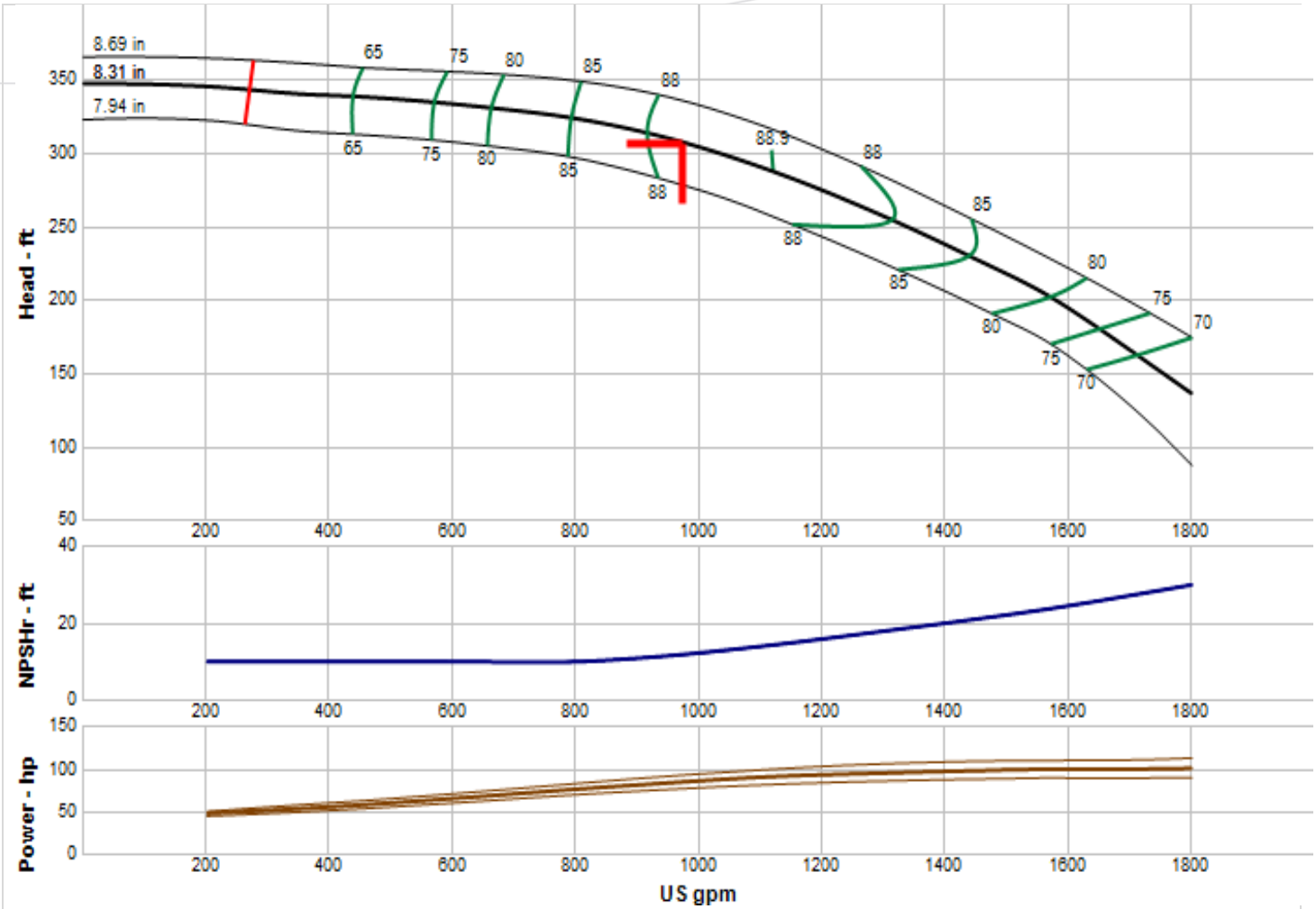
PERFORMANCE CURVE

Quote Number: 9001-150722-027
Model: VIT-CATM
Size: 12CHC 4 Stage(s)



Driver Size Criteria:	Max power on design curve (NOL)	Best Efficiency:	88.90 %
Speed:	1770	Flow at BEP:	1120.00 USGPM
Impeller Trim:	8.3100 inch	Min Flow:	280.00 USGPM
Frequency:	60 Hz	Derate Factor:	0.0000
Additional Impeller Trim:	8.310 inch	NPSH Required:	12.10 ft
Impeller Maximum Trim:	8.6900 inch	Specified NPSH Avail:	34.00 ft
Specified Flow:	975.00 USGPM	Shut-Off Head:	347.00 ft
Specified Head:	305.00 ft	Fluid Type:	Water
Head at Design:	306.00 ft	Temperature / Specifc Gravity:	70°F / 1.00
Efficiency at Design:	88.30 %	Viscosity:	0.9695 cP
Power at Design:	85.00 Hp	Allowable Sphere Size:	0.94 inch
Flow on Design Trim at Max Power:	1800 USGPM	Thrust K Factor:	7.5000 lbs/ft
Max Power on Design Curve:	101.00 Hp	Additional Thrust K Factor:	7.5000 lbs/ft
Run-Out Flow:	0.00 USGPM	Max Lateral:	1.00 inch
Run-Out Head:	0 ft		

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TURBINE SUBMITTAL

Quote Number: 9001-150722-027:2
Model: VIT-CFTM
Size: 12CHC 5 Stage(s)

OPERATING CONDITIONS

Temp / SG	70° F / SP.GR 1.00
Fluid Type	Water
Lubrication Method	Water (Open Lineshaft)
Vapor Pressure	0.3633 psi
Viscosity	0.9695 cP
Specified Flow	1340.00 USGPM
Total Dynamic Head	311.00 ft
Pumping Level	5.000 ft
TPL	0.000 ft
Sump/Pit Depth	20.000 ft
Documentation	Standard pump installation and operation manual and order data

PERFORMANCE AT 1770 RPM

Bowl Efficiency	87.10 @design, 88.90 Best Efficiency
Run Out Capacity	1800.00 USGPM
Power	121.00 @design, 126.00 NOL (Hp)
Npshr	19.00 ft @design
Design Thrust	2595.10 @design (lb)
Shut off Pressure	187.86 psi

MATERIALS AND DIMENSIONS

Bowl	Cast iron with glass enamel		
Suction Bell	Cast Iron CL30		
Bowl Wear Ring	Not Included		
Impeller	316SS		
Impeller Diameter	8.3100 inch		
Impeller Wear Ring	Not Included		
Impeller Balance	Manufacturer's Standard		
Impeller Lock Method	Taper lock	Key Material	None
Bowl Shaft	416SS, 1.6875 inch diam.		
Suction Bearing	Bronze C90300 "G" Modified		
Bowl Bearings	Bronze C90300 "G" Modified		
Rifled Drill Shaft	No		
Collets	Carbon steel		
Strainer Type	None Not Included		
Tube Bearing Adapter Material	Not Included		
Column	Carbon Steel,8" [203mm] (in) diam., 13.47 ft , Threaded		
Column Shaft Diameter	416SS, 1.5000 (in) diam.		
Column Bearing Retainer	304SS		
Lineshaft Bearings	Rubber EPDM		
Column Bearing Options	Not Included		
Max Bearing Space	10 ft (3 m) Spacing		
Lineshaft Coupling	416SS		

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Pump serial number	
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Column Shaft Sleeve	Not Included
Tube Material	Carbon Steel
Discharge Head	Cast Iron CL30
Discharge Head Style	CF
Discharge Flange	8 (in), 250#
Head Shaft Coupling	CS Type AR Rigid
Steel Sub Base	Not Included
150# Disch Companion Flange	Not Included
300# Disch Convenience Flange	Not Included
Head Bolting	Carbon steel
Head Sleeve	None
Thrust Pot	Not Required
Sealing Method	Mechanical Seal
Packing	
Mechanical Seal	John Crane 5610 XF551058H

DRIVER INFORMATION

Motor Type	
Motor Manufacturer	GE
Rating	150 Hp
Efficiency Level	
Motor Part Number	GN1501820150
Enclosure	WP1
Phase / Frequency / Volts	3 / 60 Hz / 460PWS
Speed	1800 RPM

TESTING

Hydrostatic:	Hydrostatic Testing (Non-Witness): Bowl
Performance:	Performance Testing (Non-Witness): Lab Motor, Bowl Assembly
Vibration:	None
NPSH:	None
Post Inspection:	None
Final Inspection:	None
Other:	None

COATING

Coating Information:	Goulds Water Technology Standard Blue Enamel; Bowl Assembly - STD; Column Assembly - STD; Head Assembly - STD

ADDITIONAL FEATURES

Additional Bowl Features	None added
Additional Column Features	None added
Additional Head Features:	None added
Additional Driver Features:	None added

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Pump serial number	
Project Name	
Tag:	

Additional Can features:	None added
Additional Misc features:	None added

WEIGHTS

Total bowl weight	759 lbs
Total column weight	555 lbs
Discharge head weight	540.00 lbs
Driver weight	2075.00 lbs
Approximate net weight	3929.00 lbs

Our offer does not include specific review and incorporation of any Statutory or Regulatory Requirements and the offer is limited to the requirements of the design specifications. Should any Statutory or Regulatory requirements need to be reviewed and incorporated then the Customer is responsible to identify those and provide copies for review and revision of our offer.

Our quotation is offered in accordance with our comments and exceptions identified in our proposal and governed by our standard terms and conditions of sale – Xylem Americas attached hereafter.

For units requiring performance test, all performance tests will be conducted per ANSI/HI 14.6 standards unless otherwise noted in the selection software submittal documents. Test results meeting with grade 2B tolerances for pumps with a rated shaft power of 134HP or less and grade 1B for greater than 134HP will be considered passing.

Customer is responsible for verifying that the recommendations made and the materials selected are satisfactory for the Customer's intended environment and Customer's use of the selected pump. Customer is responsible for determining the suitability of Xylem recommendations for all operating conditions within Customer's and/or End User's control. Xylem disclaims all warranties, express or implied warranties, including, but not limited to, warranties of merchantability and fitness for a particular purpose and all express warranties other than the limited express warranty set forth in the attached standard terms and conditions of sale – Xylem Americas attached hereafter.

Xylem does not guarantee any pump intake configuration. The hydraulic and structural adequacies of these structures are the sole responsibility of the Customer or his representatives. Further, Xylem accepts no liability arising out of unsatisfactory pump intake field operating conditions.

The Customer or his representatives are referred to the Hydraulic Institute Standards for recommendations on pump intake design. To optimize the hydraulic design of a field pump intake configuration, the Customer should strongly consider performing a detailed scale model pump intake study. However, the adequacies of these recommendations are the sole responsibility of the Customer.

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HYDRAULIC ANALYSIS

Quote Number: 9001-150722-027
Model: VIT-CFTM
Size: 12CHC 5 Stage(s)

OVERALL PUMP PARAMETERS

Capacity:	1340.00 USGPM	Total Dynamic Head:	311.00 ft
Total Pump Length:	0.000 ft	Impeller Trim:	8.3100 inch
Pump Type:	VIT - Short Set Lineshaft Turbine Pumps	Head Type:	Type CF (Cast Iron F-Head)
Pump K-Factor:	7.5000 lbs/ft	Number of Stages:	5
Additional Pump K-Factor:	7.5000 lbs/ft	Pumping Level:	5.000 ft
Pump Operating Speed [RPM]:	1770		

LINE SHAFT RELATED DATA

Shaft Diameter:	1.5000 inch	Shaft Limit :	256 Hp
Shaft Material:	416SS	Material Correction Fact:	1.18
Line Shaft Length:	161.64 inch	Shaft Elongation:	0.00736 inch
Line Shaft Type:	Water (Open Lineshaft)	Impeller Running Clearance:	0.13 inch

BOWL DATA

Total Bowl Length:	70.36 inch	Bowl Shaft Limit:	371 Hp
Bowl Shaft Diameter:	1.6875 inch	Bowl Shaft Material:	416SS
Bowl Diameter:	11.750 inch		

COLUMN DATA

Column Diameter [in]:	8	Column Elongation:	0.00166 inch
Column Wall Thickness:	0.320 inch	Shut Off Column Elongation:	0.00229 inch
Column Load:	2808.80 lb		

HORSEPOWER DATA

Shaft Friction Loss:	0.14912 Hp	Thrust Load Loss:	0.33443 Hp
Bowl Hp at Design:	121 Hp	Motor Hp:	121 Hp

OTHER DATA

Hydraulic Thrust:	2332.30 lb	Thrust at Design:	2595.10 lb
Thrust at Shut Off:	3541.41 lb	Actual Head Above Grade:	304.53 ft
Available Lateral:	1.00 inch	Design Lateral:	0.13570 inch
Shut Off Lateral:	0.13820 inch		
Suction Head:	0.00 ft	Shut Off Discharge Pressure:	187.86 psi
Column Loss:	0.64 ft	NPSHa:	44.21 ft
Head Loss:	0.83 ft	NPSHr:	19.00 ft @design
Total Loss:	1.47 ft	NPSH Margin:	2.00 ft

EFFICIENCY DATA

Bowl Efficiency:	88.90 %	Overall Efficiency:	82.00 %
Motor Efficiency:	95.00 %	KWH per 1000 gallons:	1.19
Pump Efficiency:	86.30 %		

FLUID DATA

Fluid Type:	Water	Specific Gravity:	0.9999
Temperature:	70°F	Viscosity:	0.9695 cP

COMPONENT WEIGHTS

Bowl Weight:	759 lbs	Column Weight:	555 lbs
Head Weight:	540 lbs	Can Weight:	0 lbs
Driver Weight:	2075 lbs	Total Pump Weight:	3929 lbs

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Project Name	
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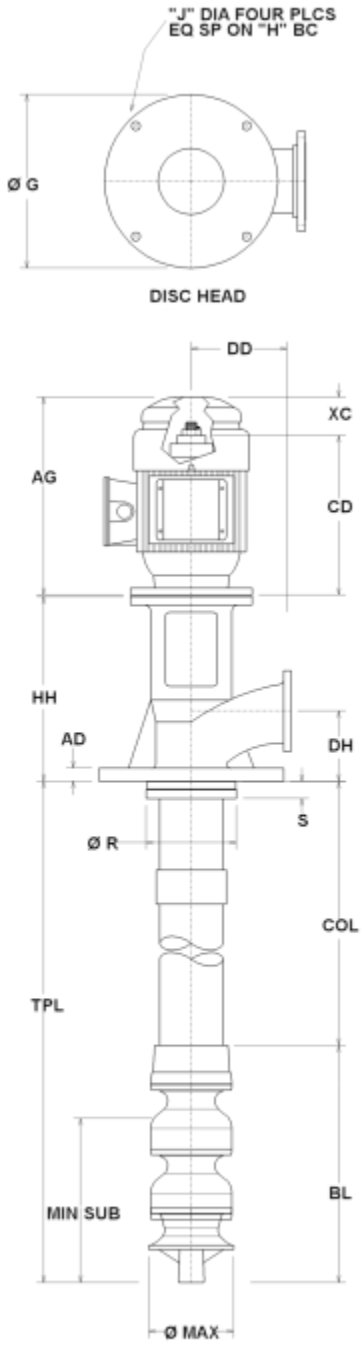
OUTLINE DRAWING

Quote Number: 9001-150722-027
Model: VIT-CFTM
Size: 12CHC 5 Stage(s)



DIMENSIONS

AD	1.19	inch
AG	50.11	inch
BD	20.0	inch
BL	70.36	inch
CD	44.80	inch
CL	0.00	inch
COL	161.64	inch
DD	12.00	inch
MIN SUB	26.57	inch
DH	8.75	inch
G	21.00	inch
H	18.75	inch
HH	26.00	inch
J	0.75	inch
L	0.00	inch
M		
R	12.00	inch
S	2.06	inch
SU	0.00	inch
SUT	0.00	inch
TUBE	0.00	inch
TPL	0.00	inch
UG	0.00	inch
V	0.00	inch
W	0.00	inch
X	0.00	inch
XC	0.00	inch
Y	0.00	inch
Z	0.00	inch
Max Dia	11.75	inch
Discharge	(250 #) 8	inch
Suction	(150 #) 10	inch

Weights

Total bowl	759.00	lb
Total column	555	lb
Discharge head	540.00	lb
Driver	2075.00	lb
Approx weight	3929.00	lb

PUMP DATA

No. of Units	1.00
Model:	VIT-CFTM 12CHC
Stages:	5
Col Size:	8" [203mm]
Shaft:	1.5000 in dia
Flow:	1340.00 USGPM
Head:	311.00 ft
Driver Mfr:	GE
Driver Type:	VHS
Size:	121 Hp
Speed:	1800 RPM
Phase:	3
Frequency:	60 Hz
Voltage:	460PWS

No.	NOTES
1	*Total Pump Length ± 1.0 inch.*
2	*Tolerance on all dimensions is .12 or ± .12 inch per 5 ft, whichever is greater.*
3	*All dimensions shown are in inches unless otherwise specified.*
4	*Drawing not to scale.*
5	*½" NPT – Gauge Conn (plugged)*
6	*Driver may be rotated at 90º intervals about vertical centerline for details refer to driver dimension drawing.*
7	*Before starting pump, impeller must be lifted 0.19 inch.*
8	*This assembly has been designed so that its natural frequency responses avoid the specific operating speeds by an adequate safety margin. The design has assumed the foundation to be rigid.*

DO NOT USE FOR CONSTRUCTION UNLESS CERTIFIED	
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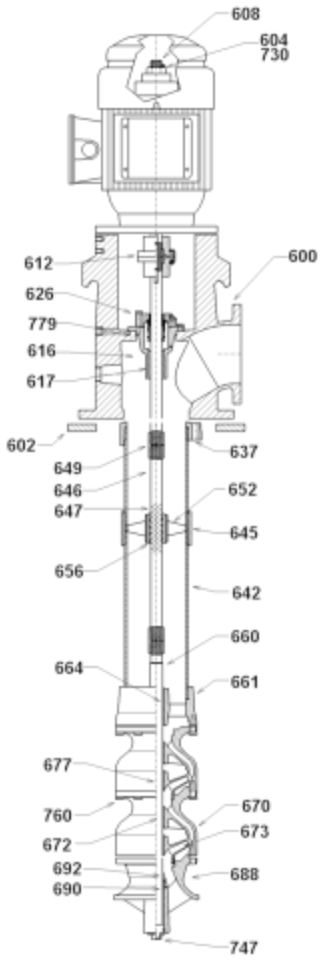
Date of certification	
Pump serial number	
Project Name	
Tag	

CROSS SECTIONAL

Quote Number: 9001-150722-027:2
Model: VIT-CFTM
Size: 12CHC 5 Stage(s)

BILL OF MATERIAL

ITEM	Part Name	CODE	MATERIAL	ASTM#
Discharge Head Assembly				
600	Head – Discharge	1003	Cast Iron CL30	A48-94ae1
602	Head – Base Plate	N/A	Not Included	N/A
604	Nut – Adjusting	2242	Carbon Steel 1018	A108-99
608	Headshaft	2227	416SS	A582M-95b
616	Housing	1003	Cast Iron CL30	A48-94-ae1
617	Bearing-Housing	1109	Bronze C90300 "G" Modified	B584-00
626	Seal	0000	John Crane 5610 XF551058H	
730	Key – Motor GIB	2242	Carbon Steel 1018	A108-99
779	Gasket – Housing	5136	Acrylic/Nitrile	5136 Rev 4
Column and Lineshaft Assembly				
637	Hanger Flange	1003	Cast Iron CL30	A48-94ae1
642	Column Pipe	9645	Carbon Steel	A53
645	Column-Coupling	9645	Carbon Steel	A53
646	Lineshaft	2227	416SS	A582M-95b
649	Lineshaft Coupling	2265	416SS	A582M-95b
652	Retainer-Bearing	1205	304SS	A744M-00
656	Lineshaft Bearing	5121	Rubber EPDM	D3568-98
Bowl Assembly				
660	Bowl-Shaft	2227	416SS	A582M-95b
664	Bearing – Disc Bowl	1109	Bronze C90300 "G" Modified	B584-00
670	Bowl-Inter	6911	Cast Iron CL30 Enamel	A48-94e1
672	Bearing-Int Bowl	1109	Bronze C90300 "G" Modified	B584-00
673	Impeller	1203	316SS	A744M-00
677	Collet-Impeller	2242	Carbon steel	A108-99
674	Key-Impeller	N/A	None	N/A
680	Wear Ring-Bowl	N/A	Not Included	N/A
681	Wear Ring-Impeller	N/A	Not Included	N/A
688	Bowl/Bell-Suction	1003	Cast Iron CL30	A48-94e1
690	Bearing-Suction	1109	Bronze C90300 "G" Modified	B584-00
692	Sandcollar	1205	304SS	A744M-00
698	Strainer Type	N/A	None	N/A
747	Plug-Pipe	1046	Malleable Iron	A197
760	Capscrew-Hex	2298	Steel Bolting Gr8	J429-99

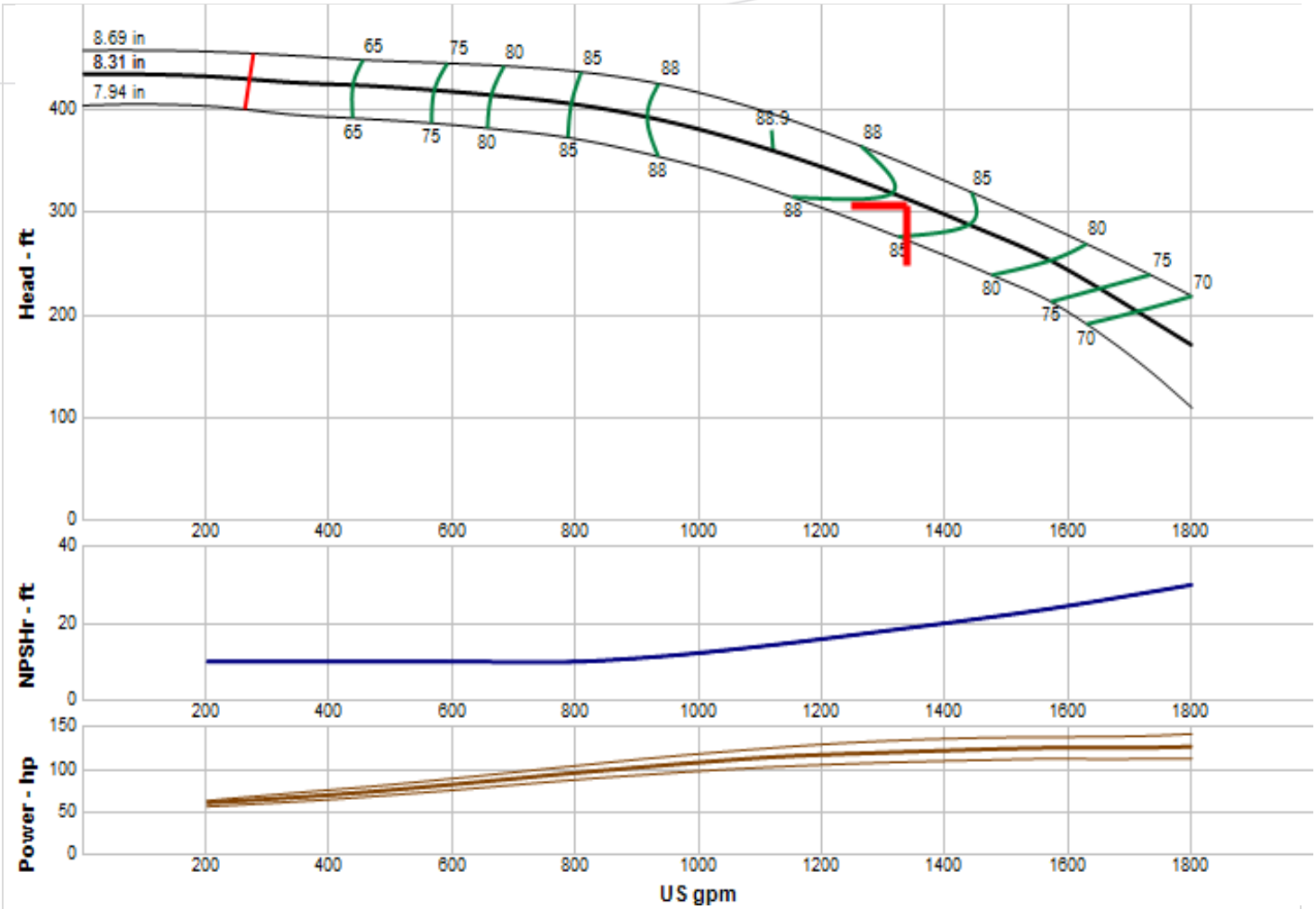


DO NOT USE FOR CONSTRUCTION UNLESS CERTIFIED	
Certified by	
Date of certification	
Pump serial number	
Project Name	
Tag	

GOULDS WATER TECHNOLOGY
a xylem brand

PERFORMANCE CURVE

Quote Number: 9001-150722-027
Model: VIT-CFTM
Size: 12CHC 5 Stage(s)



Driver Size Criteria:	Max power on design curve (NOL)	Best Efficiency:	88.90 %
Speed:	1770	Flow at BEP:	1120.00 USGPM
Impeller Trim:	8.3100 inch	Min Flow:	280.00 USGPM
Frequency:	60 Hz	Derate Factor:	0.0000
Additional Impeller Trim:	8.310 inch	NPSH Required:	19.00 ft
Impeller Maximum Trim:	8.6900 inch	Specified NPSH Avail:	34.00 ft
Specified Flow:	1340.00 USGPM	Shut-Off Head:	434.00 ft
Specified Head:	305.00 ft	Fluid Type:	Water
Head at Design:	311.00 ft	Temperature / Specifc Gravity:	70°F / 1.00
Efficiency at Design:	87.10 %	Viscosity:	0.9695 cP
Power at Design:	121.00 Hp	Allowable Sphere Size:	0.94 inch
Flow on Design Trim at Max Power:	1800 USGPM	Thrust K Factor:	7.5000 lbs/ft
Max Power on Design Curve:	126.00 Hp	Additional Thrust K Factor:	7.5000 lbs/ft
Run-Out Flow:	0.00 USGPM	Max Lateral:	1.00 inch
Run-Out Head:	0 ft		

DO NOT USE FOR CONSTRUCTION UNLESS CERTIFIED	
Certified by	
Date of certification	
Pump serial number	
Project Name	
Tag	

1. Agreement, Integration and Conflict of Terms. These terms and conditions, together with any special conditions expressly incorporated thereto in the quotation or sales form, are to govern any sale between the Seller and Buyer. The Seller shall mean the applicable affiliate of Xylem Inc. that is party to the Agreement ("Seller"). The Buyer shall mean the entity that is party to the Agreement with Seller. This writing is an offer or counteroffer by Seller to sell the goods and/or services set forth on the quotation or sales form subject to these terms and conditions and is expressly made conditional on Buyer's assent to these terms and conditions. Acceptance by Buyer is expressly limited to these terms and conditions. Any additional or different terms and conditions contained in Buyer's purchase order or other communication shall not be effective or binding upon Seller unless specifically agreed to in writing by Seller; Seller hereby objects to any such conditions, and the failure of Seller to object to specific provisions contained in any purchase order or other communication from Buyer shall not be construed as a waiver of these terms and conditions nor an acceptance of any such provisions. Neither Seller's commencement of performance nor delivery shall be deemed or construed as acceptance of Buyer's additional or different terms and conditions. Buyer agrees that these terms and conditions, together with any accompanying quotation and any special conditions or limited process guarantees or documents referred to or included within the quotation and expressly made a part of this agreement, (e.g., drawings, illustrations, specifications, or diagrams), is the complete and final agreement between Buyer and the Seller ("Agreement"). This Agreement supersedes all prior negotiations, representations, or agreements, either written or oral, between the parties and, further, can only be altered, modified or amended with the express written consent of Seller.

2. Quotation, Withdrawal, Expiration. Quotes are valid for thirty (30) calendar days from the date of issuance unless otherwise provided therein. Seller reserves the right to cancel or withdraw the quotation at any time with or without notice or cause prior to acceptance by Buyer. There is no Agreement if any conditions specified within the quotation ***or*** sales form are not completed by Buyer to Seller's satisfaction within thirty (30) calendar days of Seller's acknowledgement in writing of an order. Seller nevertheless reserves its right to accept any contractual documents received from Buyer after this 30-day period.

3. Prices. Prices apply to the specific quantities stated on the quotation or sales form. Unless otherwise agreed to in writing by Seller, all prices are Ex Works Seller's plant (as defined in accordance with the latest version of Incoterms), and do not include transportation costs or charges relating to transportation, which costs and charges shall be solely the responsibility of Buyer. Prices include standard packing according to Seller's specifications for delivery. All costs and taxes for special packing requested by Buyer, including packing for exports, shall be paid by Buyer as an additional charge. Prices are subject to change without notice.

4. Taxes. The price for the goods does not include any applicable sales, use, excise, GST, VAT, or similar tax, duties or levies. Buyer shall have the responsibility for the payment of such taxes if applicable.

5. Payment Terms. Seller reserves the right to require payment in advance or C.O.D. and otherwise modify credit terms should Buyer's credit standing not meet Seller's acceptance. Unless different payment terms are expressly set forth in the quotation or sales form or order acknowledgment or Sales Policy Manual, goods will be invoiced upon shipment. ***Payment shall be made in U.S. Dollars.*** Payment in full is due within thirty (30) days from the invoice date. In the event payment is not made when due, Buyer agrees to pay Seller a service or finance charge of the lesser of (i) one and one-half percent (1.5%) per month (18% per annum), or (ii) the highest rate permitted by applicable law, on the unpaid balance of the invoice from and after the invoice due date. Buyer is responsible for all costs and expenses associated with any checks returned due to insufficient funds. All credit sales are subject to prior approval of Seller's credit department. Export shipments will require payment prior to shipment or an appropriate Letter of Credit. If, during the performance of the contract with Buyer, the financial responsibility or condition of Buyer is such that Seller in good faith deems itself insecure, or if Buyer becomes insolvent, or if a material change in the ownership of Buyer occurs, or if Buyer fails to make any payments in accordance with the terms of its contract with Seller, then, in any such event, Seller is not obligated to continue performance under the contract and may stop goods in transit and defer or decline to make delivery of goods, except upon receipt of satisfactory security or cash payments in advance, or Seller may terminate the order upon written notice to Buyer without further obligation to Buyer whatsoever. If Buyer fails to make payments or fails to furnish security satisfactory to Seller, then Seller shall also have the right to enforce payment to the full contract price of the work completed and in process. Upon default by Buyer in payment when due, Buyer shall immediately pay to Seller the entire unpaid amounts for any and all shipments made to Buyer irrespective of the terms of said shipment and whether said shipments are made pursuant to this Agreement or any other contract of sale between Seller and Buyer, and Seller may withhold all subsequent shipments until the full amount is settled. Acceptance by Seller of less than full payment shall not be a waiver of any of its rights hereunder. Buyer shall not assign or transfer this Agreement or any interest in it, or monies payable under it, without the written consent of Seller and any assignment made without such consent shall be null and void.

6. Delivery, Risk of Loss. Delivery dates are estimates, and time is not of the essence. All shipments will be made Ex Works Seller's plant or Distribution Center unless otherwise specified. Seller shall not be responsible to Buyer for any loss, whether direct, indirect, incidental or consequential in nature, including without limitation loss of profits, arising out of or relating to any failure of the goods to be delivered by the specified delivery date. In the absence of specific instructions, Seller will select the carrier. Upon delivery to the common carrier, title and the risk of loss for the material shall pass to Buyer. Buyer shall reimburse Seller for the additional cost of its performance resulting from inaccurate or lack of delivery instructions, or by any act or omission on Buyer's part. Any such additional cost may include, but is not limited to, storage, insurance, protection, re-inspection and delivery expenses. Buyer further agrees that any payment due on delivery shall be made on delivery into storage as though goods had been delivered in accordance with the order.

Buyer grants to Seller a continuing security interest in and a lien upon the products and the proceeds thereof (including insurance proceeds), as security for the payment of all such amounts and the performance by Buyer of all of its obligations to Seller pursuant to the order and all such other sales, and Buyer shall have no right to sell, encumber or dispose of the products. Buyer shall execute any and all financing statements and other documents and instruments and do and perform any and all other acts and things which Seller may consider necessary, desirable or appropriate to establish, perfect or protect Seller's title, security interest and lien. In addition, Buyer authorizes Seller and its agents and employees to execute any and all such documents and instruments and do and perform any and all such acts and things, at Buyer's expense, in Buyer's name and on its behalf. Such documents and instruments may also be filed without the signature of Buyer to the extent permitted by law.

7. Warranty. For goods sold by Seller to Buyer that are used by Buyer for personal, family or household purposes, Seller warrants the goods to Buyer on the terms of Seller's limited warranty available on Seller's website. For goods sold by Seller to Buyer for any other purpose, Seller warrants that the goods sold to Buyer hereunder (with the exception of membranes, seals, gaskets, elastomer materials, coatings and other "wear parts" or consumables all of which are not warranted except as otherwise provided in the quotation or sales form) will be (i) be built in accordance with the specifications referred to in the quotation or sales form, if such specifications are expressly made a part of this Agreement, and (ii) free from defects in material and workmanship for a period of one (1) year from the date of installation or eighteen (18) months from the date of shipment (which date of shipment shall not be greater than thirty (30) days after receipt of notice that the goods are ready to ship), whichever shall occur first, unless a longer period is provided by law or is specified in the product documentation (the "Warranty").

Except as otherwise provided by law, Seller shall, at its option and at no cost to Buyer, either repair or replace any product which fails to conform with the Warranty; provided, however, that under either option, Seller shall not be obligated to remove the defective product or install the replaced or repaired product and Buyer shall be responsible for all other costs, including, but not limited to, service costs, shipping fees and expenses. Seller shall have complete discretion as to the method or means of repair or replacement. Buyer's failure to comply with Seller's repair or replacement directions shall constitute a waiver of its rights and render all warranties void. Any parts repaired or replaced under the Warranty are warranted only for the balance of the warranty period on the parts that were repaired or

replaced. The Warranty is conditioned on Buyer giving written notice to Seller of any defects in material or workmanship of warranted goods within ten (10) days of the date when any defects are first manifest. Seller shall have no warranty obligations to Buyer with respect to any product or parts of a product that: (a) have been repaired by third parties other than Seller or without Seller's written approval; (b) have been subject to misuse, misapplication, neglect, alteration, accident, or physical damage; (c) have been used in a manner contrary to Seller's instructions for installation, operation and maintenance; (d) have been damaged from ordinary wear and tear, corrosion, or chemical attack; (e) have been damaged due to abnormal conditions, vibration, failure to properly prime, or operation without flow; (f) have been damaged due to a defective power supply or improper electrical protection; or (g) have been damaged resulting from the use of accessory equipment not sold by Seller or not approved by Seller in connection with products supplied by Seller hereunder. In any case of products not manufactured by Seller, there is no warranty from Seller; however, Seller will extend to Buyer any warranty received from Seller's supplier of such products.

THE FOREGOING WARRANTY IS EXCLUSIVE AND IN LIEU OF ANY AND ALL OTHER EXPRESS OR IMPLIED WARRANTIES, GUARANTEES, CONDITIONS OR TERMS OF WHATEVER NATURE RELATING TO THE GOODS PROVIDED HEREUNDER, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WHICH ARE HEREBY EXPRESSLY DISCLAIMED AND EXCLUDED. EXCEPT AS OTHERWISE PROVIDED BY LAW, BUYER'S EXCLUSIVE REMEDY AND SELLER'S AGGREGATE LIABILITY FOR BREACH OF ANY OF THE FOREGOING WARRANTIES ARE LIMITED TO REPAIRING OR REPLACING THE PRODUCT AND SHALL IN ALL CASES BE LIMITED TO THE AMOUNT PAID BY THE BUYER HEREUNDER. IN NO EVENT IS SELLER LIABLE FOR ANY OTHER FORM OF DAMAGES, WHETHER DIRECT, INDIRECT, LIQUIDATED, INCIDENTAL, CONSEQUENTIAL, PUNITIVE, EXEMPLARY OR SPECIAL DAMAGES, INCLUDING BUT NOT LIMITED TO LOSS OF PROFIT, LOSS OF ANTICIPATED SAVINGS OR REVENUE, LOSS OF INCOME, LOSS OF BUSINESS, LOSS OF PRODUCTION, LOSS OF OPPORTUNITY OR LOSS OF REPUTATION.

8. Inspection. Buyer shall have the right to inspect the goods upon their receipt. When delivery is to Buyer's site or to a project site ("Site"), Buyer shall notify Seller in writing of any nonconformity of the goods with this Agreement within three (3) days from receipt by Buyer. For all other deliveries, Buyer shall notify Seller in writing of any nonconformity with this Agreement within fourteen (14) days from receipt by Buyer. Failure to give such applicable notice shall constitute a waiver of Buyer's right to inspect and/or reject the goods for nonconformity and shall be equivalent to an irrevocable acceptance of the goods by Buyer. Claims for loss of or damage to goods in transit must be made to the carrier, and not to Seller.

9. Seller's Limitation of Liability. EXCEPT AS OTHERWISE PROVIDED BY LAW, IN NO EVENT SHALL SELLER'S LIABILITY UNDER THIS AGREEMENT EXCEED THE AMOUNT PAID BY BUYER UNDER THIS AGREEMENT. SELLER SHALL HAVE NO LIABILITY FOR LOSS OF PROFIT, LOSS OF ANTICIPATED SAVINGS OR REVENUE, LOSS OF INCOME, LOSS OF BUSINESS, LOSS OF PRODUCTION, LOSS OF OPPORTUNITY, LOSS OF REPUTATION, INDIRECT, CONSEQUENTIAL, INCIDENTAL, PUNITIVE OR EXEMPLARY DAMAGES.

10. Force Majeure. Seller may cancel or suspend this Agreement and Seller shall have no liability for any failure to deliver or perform, or for any delay in delivering or performing any obligations, due to acts or omissions of Buyer and/or its contractors, or due to circumstances beyond Seller's reasonable control, including but not limited to acts of God, fire, flood or other natural disasters, war and civil disturbance, riot, acts of governments, terrorism, disease, currency restrictions, labor shortages or disputes, unavailability of materials, fuel, power, energy or transportation facilities, failures of suppliers or subcontractors to effect deliveries, in which case the time for performance shall be extended in an amount equal to the excused period, provided that Seller shall have, as soon as reasonably practicable after it has actual knowledge of the beginning of any excusable delay, notified Buyer of such delay, of the reason therefor and of the probable duration and consequence thereof. Seller shall use its best efforts to eliminate the cause of the delay, interruption or cessation and to resume performance of its obligations hereunder with the least possible delay.

11. Cancellation. Except as otherwise provided in this Agreement, no order may be cancelled on special or made-to-order goods or unless otherwise requested in writing by either party and accepted in writing by the other. In the event of a cancellation by Buyer, Buyer shall, within thirty (30) days of such cancellation, pay Seller a cancellation fee, which shall include all costs and expenses incurred by Seller prior to the receipt of the request for cancellation including, but not limited to, all commitments to its suppliers, subcontractors and others, all fully burdened labor and overhead expended by Seller, plus a reasonable profit charge." Return of goods shall be in accordance with Seller's most current Return Materials Authorization and subject to a minimum fifteen percent (15%) restocking fee.

Notwithstanding anything to the contrary herein, in the event of the commencement by or against Buyer of any voluntary or involuntary proceedings in bankruptcy or insolvency, or in the event Buyer shall be adjusted bankrupt, make a general assignment for the benefit of its creditors, or if a receiver shall be appointed on account of Buyer's insolvency, or if Buyer fails to make payment when due under this Agreement, or in the event Buyer does not correct or, if immediate correction is not possible, commence and diligently continue action to correct any default of Buyer to comply with any of the provisions or requirements of this Agreement within ten (10) calendar days after being notified in writing of such default by Seller, Seller may, by written notice to Buyer, without prejudice to any other rights or remedies which Seller may have, terminate its further performance of this Agreement. In the event of such termination, Seller shall be entitled to receive payment as if Buyer has cancelled the Agreement as per the preceding paragraph. Seller may nevertheless elect to complete its performance of this Agreement by any means it chooses. Buyer agrees to be responsible for any additional costs incurred by Seller in so doing. Upon termination of this Agreement, the rights, obligations and liabilities of the parties which shall have arisen or been incurred under this Agreement prior to its termination shall survive such termination.

12. Drawings. All drawings are the property of Seller. Seller does not supply detailed or shop working drawings of the goods; however, Seller will supply necessary installation drawings. The drawings and bulletin illustrations submitted with Seller's quotation show general type, arrangement and approximate dimensions of the goods to be furnished for Buyer's information only and Seller makes no representation or warranty regarding their accuracy. Unless expressly stated to the contrary within the quotation or sales form, all drawings, illustrations, specifications or diagrams form no part of this Agreement. Seller reserves the right to alter such details in design or arrangement of its goods which, in its judgment, constitute an improvement in construction, application or operation. All engineering information necessary for installation of the goods shall be forwarded by Seller to Buyer to upon Buyer's acceptance of this Agreement. After Buyer's acceptance of this Agreement, any changes in the type of goods, the arrangement of the goods, or application of the goods requested by Buyer will be made at Buyer's expense. Instructions necessary for installation, operating and maintenance will be supplied when the goods are shipped.

13. Proprietary Information, Injunction. Seller's designs, illustrations, drawings, specifications, technical data, catalogues, "know-how", economic or other business or manufacturing information (collectively "Proprietary Information") disclosed to Buyer shall be deemed proprietary and confidential to Seller. Buyer agrees not to disclose, use, or reproduce any Proprietary Information without first having obtained Seller's express written consent. Buyer's agreement to refrain from disclosing, using or reproducing Proprietary Information shall survive completion of the work under this Agreement. Buyer acknowledges that its improper disclosure of Proprietary Information to any third party will result in Seller's suffering irreparable harm. Seller may seek injunctive or equitable relief to prevent Buyer's unauthorized disclosure.

14. Installation and Start-up. Unless otherwise agreed to in writing by Seller, installation shall be the sole responsibility of Buyer. Where start-up service is required with respect to the goods purchased hereunder, it must be performed by Seller's authorized personnel or agents; otherwise, the Warranty is void. In the event Buyer has engaged Seller to provide an engineer for start-up supervision, such engineer will function in a supervisory capacity only and Seller shall have no responsibility for the

quality of workmanship of the installation. In any event, Buyer understands and agrees that it shall furnish, at Buyer's expense, all necessary foundations, supplies, labor and facilities that might be required to install and operate the goods.

15. Specifications. Changes in specifications requested by Buyer are subject to approval in writing by Seller. In the event such changes are approved, the price for the goods and the delivery schedule shall be changed to reflect such changes.

16. Buyer Warranty. Buyer warrants the accuracy of any and all information relating to the details of its operating conditions, including temperatures, pressures, and where applicable, the nature of all hazardous materials. Seller can justifiably rely upon the accuracy of Buyer's information in its performance. Should Buyer's information prove inaccurate, Buyer agrees to reimburse Seller for any losses, liabilities, damages and expenses that Seller may have incurred as a result of any inaccurate information provided by Buyer to Seller.

17. Minimum Order. Seller reserves the right to refuse to process any order that does not meet quantity requirements that Seller may establish for any given product or group of products.

18. Quality Levels. Prices are based on quality levels commensurate with normal processing. If a different quality level is required, Buyer must specify its requirements, as approved in writing by Seller, and pay any additional costs that may be applicable.

19. Product Recalls. ***In cases where Buyer purchases for resale, Buyer shall take all reasonable steps (including, without limitation, those measures prescribed by the seller): (a) to ensure that all customers of the Buyer and authorized repairers who own or use affected products are advised of every applicable recall campaign of which the Buyer is notified by the Seller; (b) to ensure that modifications notified to Buyer by Seller by means of service campaigns, recall campaigns, service programs or otherwise are made with respect to any products sold or serviced by Buyer to its customers or authorized repairers. The reimbursement of Buyer for parts and labor used in making those modifications shall be as set forth in the campaign or program instructions. Without the prior consent of the Seller, the Buyer shall not disclose to any third party the information contained in service campaign, recall campaign or service program literature. Should Buyer fail to perform any of the actions required under this section, Seller shall have the right to obtain names and address of the Buyer's customers and shall be entitled to get into direct contact which such customers.***

19. GOVERNING LAW. THE TERMS OF THIS AGREEMENT AND ALL RIGHTS AND OBLIGATIONS HEREUNDER SHALL BE GOVERNED BY THE LAWS OF THE STATE OF SELLER'S OFFICE TO WHICH THIS ORDER HAS BEEN SUBMITTED (WITHOUT REFERENCE TO PRINCIPLES OF CONFLICTS OF LAWS). THE RIGHTS AND OBLIGATIONS OF THE PARTIES HEREUNDER SHALL NOT BE GOVERNED BY THE 1980 U.N. CONVENTION ON CONTRACTS FOR THE INTERNATIONAL SALE OF GOODS.

20. Titles. The section titles are for reference only, and shall not limit or restrict the interpretation or construction of this Agreement.

21. Waiver. Seller's failure to insist, in any one or more instances, upon Buyer's performance of this Agreement, or to exercise any rights conferred, shall not constitute a waiver or relinquishment of any such right or right to insist upon Buyer's performance in any other regard.

22. Severability. The partial or complete invalidity of any one or more provisions of this Agreement shall not affect the validity or continuing force and effect of any other provision.

GOULDS PUMPS

QUADNA

Proposal No: CP15-07-22 01
Item No: ITEM 001

DXP/Quadna
14452 W. 44th Avenue
Golden, CO 80403
Ph: 303-430-0521
Fax: 303-430-0851
Chad Post
cpost@quadna.com

July 22, 2015

MODEL:3196 LTi SIZE:4x6-10G QTY: 1

i-FRAME™

5 YEAR WARRANTY

Operating Conditions

SERVICE	
LIQUID	Water Temp. 70.0 deg F, SP.GR 1.000, Viscosity 1.000 cp, rated / max. suction pressure 0.0 / 0.0 psi g
CAPACITY Rated	1,425.0 gpm
HEAD	300.0 (ft)

Performance at 3560 RPM per HI 14.6 1B basis power

PUBLISHED EFFY	72.0% (CDS)
RATED EFFY	72.0%
RATED POWER	156.7 hp (incl. Mech. seal drag 0.52). (Run out 161.2 hp)
NPSHR	37.4 ft
DISCH PRESSURE (R)	135.8 psi g (179.0 psi g @ Shut off) based on 0.0 psi g rated suction pressure
PERF. CURVE	5379-2 (Rotation CW viewed from coupling end)
SHUT OFF HEAD	413.6 ft
MIN. FLOW	Continuous Stable: 460.8 gpm Hydraulic: 460.8 gpm Thermal: N/A

PRICE in USD	
Pump Unit	Incl
Driver	Incl
Boxing	
Testing	Incl
Freight	
Total 1 Unit	**21,265**

Materials

CONSTRUCTION	Ductile iron
CASING	Ductile iron (max.casing pressure @ rated temp. 250.0 psi g)
ST.BOX COVER	Ductile iron
IMPELLER	Ductile iron - Open (9.8750 in rated, max=10.2500 in, min=7.5000 in)
CASING GASKETS	Aramid Fiber with EPDM and Silicate Filler
IMPELLER O-RING	Teflon
SHAFT MATERIAL	SAE 4140
SHAFT SLEEVE	316SS
LUBRICATION	Flood oil
SEAL CHAMBER	Taper bore plus with axial ribs
GLAND	316SS Flush quench and drain
BEARINGS	6311 (Inboard) 7310 (Outboard)
COUPLING	T.B. Wood's - SCH8-35-10-S.F. 1.00
COUPLING GUARD	Carbon steel
BASEPLATE	Fabricated steel to ANSI B73.1M 1991 D07087A

Sealing Method

MECHANICAL SEAL	John Crane 5611Q X(1)O(58)1XO(58)1 (Silicon Carbide vs Silicon Carbide with Viton) - (Cartridge - Single)

Flanges

150# flat face

Frame Connections

Bearing frame drain

Frame cooler access

Oil fill connection

Frame features

Ductile iron frame adapter

Duplex bearing

Inpro VBXX-D Hybrid Bearing Isolators

i- ALERT™ Condition Monitor

Assembly and Testing

Casing & Cover - Standard hydro test

Impeller balanced to ISO G1.0

Painting

Goulds Blue standard painting

Warranty

5 Year Extended Warranty (All the components, manufactured by ITT Goulds pumps, in the liquid end and power end are covered).

Driver : Electric motor Manufacturer : Pump mfg's Choice

FURNISHED BY	Pump mfg	MOUNTED BY	Pump mfg
RATING	200.0 hp (149.1 KW)	ENCLOSURE	TEFC - Premium Efficiency
PHASE/FREQ/VOLTS	3/60 Hz/460	SPEED	3600 RPM
INSULATION/SF	F/1.15	FRAME	447TS

Freight Terms

Freight invoices received from ITT partner carriers are proprietary information and cannot be divulged for any reason. ITT will provide an ITT generated freight invoice upon request.

Weights and Measurements

TOTAL NET UNIT WEIGHT / VOLUME	**3,092.0 lb / 35.5 ft³**
TOTAL GROSS UNIT WEIGHT / GROSS VOLUME	**3,514.0 lb / 84.4 ft³**

Program Version 1.53.3.0

Drawing Revision Limit

Drawings returned with status approved as noted or revise and re-submit will be corrected and resubmitted only once. Thereafter, additional comments or revisions to these drawings will incur a charge of $250 per drawing.

Our offer does not include specific review and incorporation of any Statutory or Regulatory Requirements and the offer is limited to the requirements of the design specifications. Should any Statutory or Regulatory requirements need to be reviewed and incorporated then the Customer is responsible to identify those and provide copies for review and revision of our offer.

Our quotation is offered in accordance with our conditions of Sale.

Click here to download the pump Bulletin

Click here to learn more about the new *i-FRAME™*

Are you aware of PumpSmart Process Systems?

PumpSmart is a system that utilizes a standard process pump in conjuction with ITT unique and patented PumpSmart Control System and Software. The software, which resides on the controller microprocessor chip, allows the pump to monitor and react to any system condition.

PumpSmart

* Eliminates control valves, flow meters, and recirculation lines.
* Significantly reduces energy costs.
* Significantly increases MTBF.

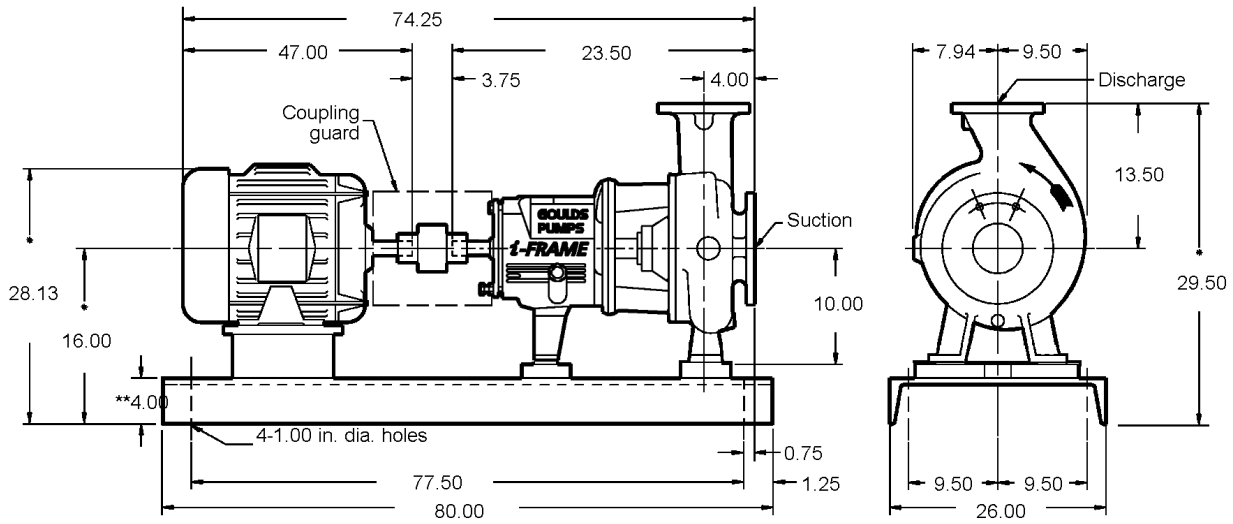
Please contact your local Goulds Pumps representative for details and a demonstration CD-ROM. You may also contact us at www.gouldspumps.com or e-mail pumpsmart@fluids.ittind.com.

GOULDS PUMPS

OUTLINE DRAWING

Model 3196 LTi
Size 4x6-10G

ITT



Pump Specification

SUCT.FLANGE SIZE	*6"*	DRILLING	*ANSI 150#*	FACING	*FF*	FINISH	*SERRATED*
DISCH.FLANGE SIZE	*4"*	DRILLING	*ANSI 150#*	FACING	*FF*	FINISH	*SERRATED*
PUMP ROTATION (LOOKING AT PUMP FROM MOTOR)	*CW*						
TYPE OF LUBRICATION	*FLOOD OIL*					COOLED	*NO*
TYPE OF STUFFING BOX	*TAPER BORE PLUS WITH AXIAL RIBS*					COOLED	*NO*
TYPE OF SEALING	*MECHANICAL SEAL*						

Weights and Measurements

PUMP	*295.0 lb*
MOTOR/CPLG	*2,260.0/15.0 lb*
BASEPLATE	*522.0 lb*
TOTAL	*3,092.0 lb*
GR.VOLUME w/BOX	*84.4 ft³*
GR.WEIGHT w/BOX	*3,514.0 lb*

Motor Specification

MOTOR BY	*PUMP MFG*	MOUNT BY	*PUMP MFG*	MFG.	*PUMP MFG'S CHOICE*
FRAME	*447TS*	POWER	*200.0 hp*	RPM	*3600*
PHASE	*3*	FREQUENCY	*60 HZ*	VOLTS	*460*
INSULATION	*F*	S.F.	*1.15*		
ENCLOSURE	*TEFC - PREMIUM EFFICIENCY*				

Notes and References

- MTR DIMENSIONS ARE APPROXIMATE
- INSTALL FOUNDATION BOLTS IN PIPE SLEEVES
- ALLOW FROM 0.75 to 1.50in. FOR GROUTING. SEE INSTRUCTION BOOK FOR DETAILS.

* Tolerance is -0.38 +0.38

** Foundation bolt grip thickness

Auxiliary Specification

COUPLING BY	*PUMP MFG*	CPLG TYPE	*T.B. WOOD'S SCH8-35-10*
CPL GUARD BY	*PUMP MFG*	CPLG GUARD MATL	*CARBON STEEL*
BASEPLATE	*FABRICATED STEEL TO ANSI B73.1M 1991 D07087A*		
MECH.SEAL	*JOHN CRANE 5611Q X(1)O(58)1XO(58)1 (SILICON CARBIDE VS SILICON CARBIDE WITH VITON)*		

FOR PUMP TAPPED OPENINGS REFER TO DWG.:
TCP15-07-22 01 / ITEM 001

DRAWING IS FOR REFERENCE ONLY.
NOT CERTIFIED FOR CONSTRUCTION UNLESS SIGNED.

Customer: QUADNA
Serial No:
Customer P.O. No:
Item No: ITEM 001
End User: Tetra Tech
Service:

All dimensions are in inches.
Drawing is not to scale
Weights (lbs) are approximate

DRAWING NO CP15-07-22 01/ITEM 001

Model: 3196	Size: 4x6-10G	Group: LTi	60Hz	RPM: 3560	Stages: 1

Job/Inq.No. :
Purchaser : QUADNA
End User: Tetra Tech
Item/Equip.No. : ITEM 001
Service :
Order No. :

Issued by : Chad Post
Quotation No. : CP15-07-22 01
Certified By :

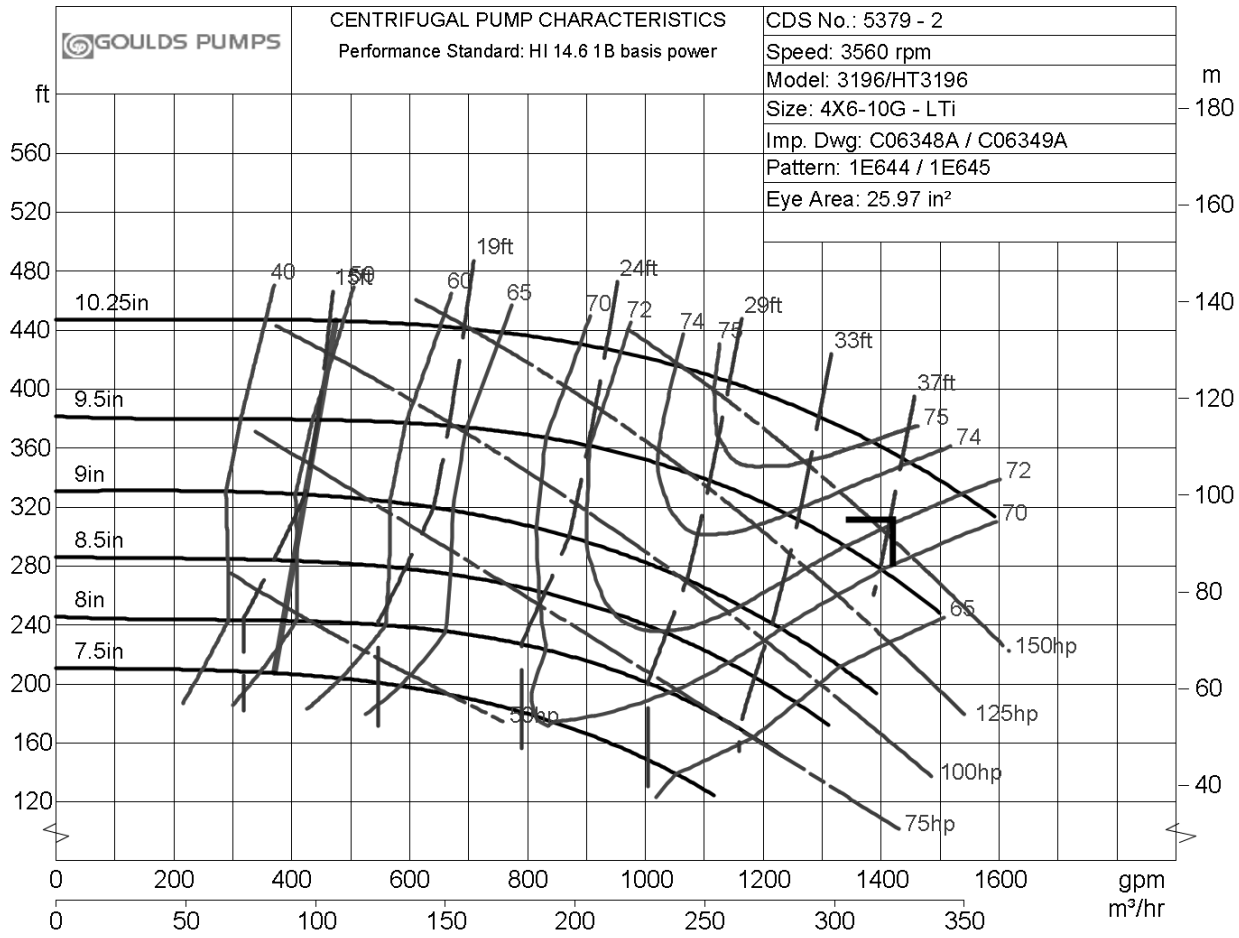
Date : 07/22/2015
Rev. : 0

Operating Conditions

Liquid:	Water	Published Efficiency:	72.0 %	Suction Specific Speed:	9,717 gpm(US) ft
Temp.:	70.0 deg F	Rated Pump Efficiency:	72.0 %	Min. Hydraulic Flow:	460.8 gpm
S.G./Visc.:	1.000/1.000 cp	Rated Total Power:	156.7 hp	Min. Thermal Flow:	N/A
Flow:	1,425.0 gpm	Non-Overloading Power:	161.2 hp		
TDH:	300.0 ft	Imp. Dia. First 1 Stg(s):	9.8750 in		
NPSHa:	0.0 ft	NPSHr:	37.4 ft		
Solid size:		Shut off Head:	413.6 ft		
% Susp. Solids (by wtg):		Vapor Press:		Max. Solids Size:	1.0000 in

Pump Performance

Notes: 1. Power and efficiency losses are not reflected on the curve below.
2. Elevated temperature effects on performance are not included.



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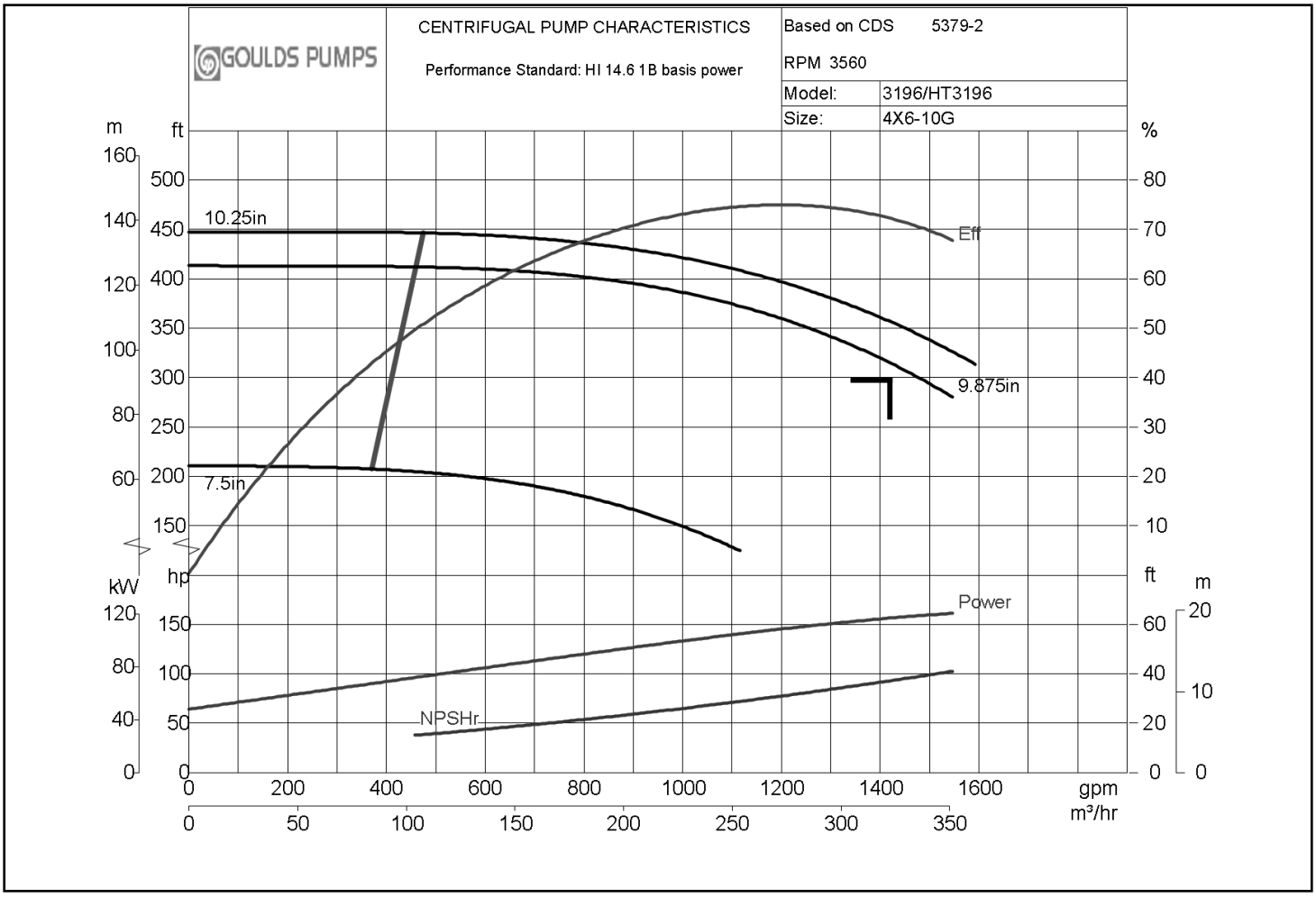

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Industrial Process
Terms & Conditions of Sale

WARRANTY
(a) Company warrants that on the date of shipment the goods are of the kind and quality described herein and are free of non-conformities in workmanship and material. This warranty does not apply to goods or parts delivered by Company but manufactured by others. (b) Buyer exclusive remedy for nonconformity in any item of the goods shall be the repair or the replacement (at Company option) of the item and any affected part of the goods. Company obligation to repair or replace shall be in effect for a period of one (1) year from initial operation of the goods but not more than eighteen (18) months from Company shipment of the goods, provided Buyer has sent written notice within that period of time to Company that the goods do not conform to the above warranty. Repaired and replacement parts shall be warranted for the remainder of the original period of notification set forth above, but in no event less than 12 months from repair or replacement. At its sole expense, Buyer shall remove and ship to Company any such nonconforming goods and shall reinstall the repaired or replaced goods or parts. Buyer shall grant Company access to the goodsnat all reasonable times in order for Company to determine any nonconformity in the goods. Company shall have the right of disposal of items replaced by it. If Company is unable or unwillingnto repair or replace, or if repair or replacement does not remedy the nonconformity, Company and Buyer shall negotiate an equitable adjustment in the order price, which may include a full refund of the order price for the nonconforming goods. (c) COMPANY HEREBY DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, EXCEPT THAT OF TITLE. SPECIFICALLY, IT DISCLAIMS THE IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, COURSE OF DEALING AND USAGE OF TRADE. (d) Buyer and successors of Buyer are limited to the remedies specified in this article and shall have no others for a nonconformity in the goods. Buyer agrees that these remedies provide Buyer and its successors with a minimum adequate remedy and are their exclusive remedies, whether Buyer or its successors remedies are based on contract, warranty, tort (including negligence), strict liability, indemnity, or any other legal theory, and whether arising out of warranties, representations, instructions, installations, or non-conformities from any cause. Buyer shall assume all responsibility and expense for removal, reinstallation and freight in connection with these remedies. (e) Company neither assumes, nor authorizes any person to assume for it, any other obligation in connection with the sale of its goods. This warranty shall not apply to any goods that: (1) have been repaired or altered outside of Company factories or authorized service centers, in any manner; or (2) have been subjected to misuse, negligence or accidents; or (3) have been improperly stored or handled or used in a manner contrary to Company instructions or recommendations; or (4) have design errors due to inaccurate or incomplete information supplied by Buyer or its agents.

LIMITATION OF LIABILITY
NEITHER COMPANY, NOR ITS SUPPLIERS SHALL BE LIABLE, WHETHER IN CONTRACT, WARRANTY, FAILURE OF A REMEDY TO ACHIEVE ITS INTENDED OR ESSENTIAL PURPOSES, TORT (INCLUDING NEGLIGENCE), STRICT LIABILITY, INDEMNITY OR ANY OTHER LEGAL THEORY, FOR LOSS OF USE, REVENUE OR PROFIT, OR FOR COSTS OF CAPITAL OR OF SUBSTITUTE USE OR PERFORMANCE, OR FOR INDIRECT, SPECIAL, LIQUIDATED, INCIDENTAL OR CONSEQUENTIAL DAMAGES, OR FOR ANY OTHER LOSS OR COST OF A SIMILAR TYPE, OR FOR CLAIMS BY BUYER FOR DAMAGES OF BUYER CUSTOMERS. COMPANY MAXIMUM LIABILITY UNDER THIS CONTRACT SHALL BE THE CONTRACT PRICE. BUYER AND COMPANY AGREE THAT THE EXCLUSIONS AND LIMITATIONS SET FORTH IN THIS ARTICLE ARE SEPARATE AND INDEPENDENT FROM ANY REMEDIES WHICH BUYER MAY HAVE HEREUNDER AND SHALL BE GIVEN FULL FORCE AND EFFECT WHETHER OR NOT ANY OR ALL SUCH REMEDIES SHALL BE DEEMED TO HAVE FAILED OF THEIR ESSENTIAL PURPOSE.

GENERAL
(a) Company will comply with all laws applicable to Company during manufacture and sale of the goods. Purchaser will comply with all laws applicable to Purchaser during operation or use of the goods. (b) The laws of the State of New York shall govern the validity, interpretation and enforcement of any order of which these provisions are a part, without giving effect to any rules governing the conflict of laws. The application of the United Nations Convention on Contracts for the International Sale of Goods shall be excluded. (c) Assignment may be made only with written consent of both parties; provided, however, Company may assign to its affiliate without Buyer consent. (d) Buyer shall be liable to Company for any attorney fees and costs incurred by Company in enforcing any of its rights hereunder. This document and any other documents specifically referred to as being a part hereof, constitute the entire contract on the subject mater, and it shall not be modified except in writing signed by both parties, Unless otherwise specified, any reference to Buyer order is for identification only.

ACCEPTANCE
The determination of compliance with performance guarantees will be based on results of factory tests under controlled conditions with calibrated instruments and tested per standards of the Hydraulic Institute, ISO standards, API standards, or other nationally recognized accreditation standards.

STATUTE OF LIMITATIONS
To the extent permitted by applicable law, any lawsuit for breach of contract, including breach of warranty, arising out of the transactions covered by this order, must be commenced not later than twelve (12) months from the date the cause of action accrued.

SHIPMENT
The term shipment means delivery to the initial carrier in accordance with the delivery terms of this order. Company may make partial shipments. Company shall select method of transportation and route, unless terms are f.o.b. point of shipment and Buyer specifies the method and route and is to pay the freight costs in addition to the price, When terms are f.o.b. destination or freight allowed to destination, destination means common carrier delivery point -within the continental United States, excluding Alaska- nearest the destination. For movement outside the United States, company shall arrange for inland carriage to port of exit and shall cooperate with Buyer agents in making necessary arrangements for overseas carriage and preparing necessary documents.

SPECIAL SHIPPING DEVICES
On shipments to a destination in the continental United States or Canada, Company has the right to add to the invoice, as a separate item, the value of any special shipping device (barrel, reel, tarpaulin, cradle, crib and the like) used to contain or protect the goods invoiced, while in transit. Full credit will be given on the return to Company of the device in a reusable condition, f.o.b. destination, freight prepaid.

DELAYS
If Company suffers delay in performance due to any cause beyond its control, including but not limited to act of God, war, act or failure to act of government, act or omission of Buyer, fire, flood, strike or labor troubles, sabotage, or delay in obtaining from others suitable services, materials, components, equipment or transportation, the time of performance shall be extended a period of time equal to the period of the delay and its consequences. Company will give Buyer notice in writing within a reasonable time after Company becomes aware of any such delay.

NONCANCELLATION
Buyer may not cancel or terminate for convenience, or direct suspension of manufacture, except with Company written consent upon terms agreed to by Company.

STORAGE
Any item of the goods on which manufacture or shipment is delayed by causes within Buyer control, or by causes which affect Buyer ability to receive the goods, may be placed in storage by Company for Buyer account and risk and Buyer shall pay all charges for storage and shipping and incidental expenses.

TITLE AND INSURANCE
Title to the goods and risk of loss or damage shall pass to Buyer at the f.o.b. point, except that a security interest in the goods and proceeds and any replacement shall remain in Company, regardless of mode of attachment to realty or other property, until the full price has been paid in cash. Buyer agrees to do all acts necessary to perfect and maintain said security interest, and to protect Company interest by adequately insuring the goods against loss or damage from any external cause with Company named as insured or co-insured.

INSPECTIONS / EXPEDITING
The Company restricts access to its facilities and requires seventy two (72) hours notice prior to each visit. Company requires that its agents or employees accompany inspectors/expeditors on their visit(s).

TERMS OF PAYMENT
Unless otherwise stated, all payments shall be by Letter of Credit or Net Thirty (30) Days and in United States dollars, and a pro rata payment shall become due as each shipment is made. If shipment is delayed by Buyer, date of readiness for shipment shall be deemed to be date of shipment for payment purposes. If at any time in Company judgment Buyer may be or may become unable or unwilling to meet the terms specified, Company may require satisfactory assurances or full or partial payment as a condition to commencing or continuing manufacture or making shipment; and may, if shipment has been made, recover the goods from the carrier, pending receipt of such assurances.

GOODS RETURN
Goods can be returned for credit only after receiving Company written authorization and shipping instructions. Consignor name and address must be plainly written on the shipping tag. Special goods fabricated to order are not returnable under any conditions.

PATENTS
Company shall pay costs and damages finally awarded in any suit against Buyer or its vendees to the extent based upon a finding that the design or construction of the goods as furnished, infringes a United States patent (except infringement occurring as a result of incorporating a design or modification at Buyer request), provided that Buyer promptly notifies Company of any charge of infringement, and Company is given the right at its expense to settle such charge and to defend or control the defense of any suit based upon such charge. Company shall have no obligation hereunder with respect to claims, suits or proceedings, resulting from or related to, in whole or in part, (a) the use of software or software documentation, (b) compliance with Buyer specifications, (c) the combination with, or modification of, the goods after delivery by Company, or (d) the use of the goods, or any part thereof, in the practice of a process. THIS ARTICLE SETS FORTH COMPANY ENTIRE LIABILITY WITH RESPECT TO PATENTS.

BUYER DATA
Timely performance is contingent upon the Buyer supplying to the Company, when needed, all required technical information, including drawing approval, and all required commercial documentation.

NUCLEAR
Buyer represents and warrants that the goods covered by this order shall not be used in or in connection with a nuclear facility or application.

PRICES
The prices stated herein will remain firm for the period up to the stated date of shipment providing the shipment is not delayed by the Buyer. If shipment is delayed by the Buyer beyond the shipment date quoted herein, the prices will be based on the prices in effect at time of shipment, including storage and material handling costs. In no event shall the adjusted price be less than the original order price, including change orders. Prices are F.O.B. Shipping Point, unless otherwise specified. When price includes transportation and other charges pertaining to the shipment of goods, any increase in transportation rates and other charges will be for the account of the Buyer. There will be an extra charge for any test other than that which may be normally run by the Company, or for any test performed to suit the convenience of the Buyer. Any applicable duties or sales, use, excise, value added or similar taxes will be added to the price and invoiced separately.

CONTROLLING PROVISIONS
These terms and conditions shall control with respect to any purchase order or sale of the Company goods. No waiver, alteration or modification of these terms and conditions whether on Buyer purchase order or otherwise shall be valid unless the waiver, alteration or modification is specifically accepted in writing and signed by an authorized representative the of Company.

EXPORT
If this transaction involves EXPORT, the following additional terms and conditions shall apply:

- Compliance is required for ALL applicable US export laws, and the export laws of the country from where the goods are exported.Buyer acknowledges that it will comply with all applicable export or re-export restrictions and regulatory requirements in the purchase or resale of Products from the Company. Buyer acknowledges that this may include US export or re-export restrictions and controls in addition to requirements enforced by other international export control regimes, as applicable. Buyer agrees to full disclosure of all parties to a proposed sales transaction, and to comply with all license terms and conditions, destination control statements, or other restrictions on the export or re-export of Products. Buyer agrees that it will not divert such products to any unauthorized party or destination, including embargoed or sanctioned territories or countries. Buyer will include all information pertaining to export classification (ECCN or equivalent), applicable license restrictions, and authorized destination of the Product in its export and shipping documentation.
- **PACKING**
  When packing is available, equipment will be packed, boxed or crated in accordance with the Company standard commercial practice, for underdeck export shipment, unless otherwise agreed.
- **LETTER OF CREDIT**
  Unless otherwise specified in writing, payment shall be made by irrevocable letter of credit in form acceptable to Company, confirmed by a major USA bank, acceptable to the Company and providing for payment in full in United States dollars against presentation of United States inland shipping documents and invoices, such letter of credit to be established prior to Company acceptance of the order. The letter of credit shall also provide that in the event Company is, for any reason beyond its control, prevented from making shipment from Company factory or delivery at the port of embarkation, a certificate of manufacture of the whole or any part of the goods shall constitute delivery of such whole or any part of the goods and payment in full of any and all drafts drawn against the letter of credit for the goods so delivered shall be made upon presentation of such certificates of manufacture in lieu of United States inland shipping documents. In the event that Company is prevented by law, or otherwise, from making shipment from Company factory or delivery at port of embarkation of the goods or any part thereof, on completion of manufacture, Company reserved the right to place the goods in storage for the Buyer account and risk. Any charges incurred in this connection will be for the account of the Buyer at cost and will be payable upon demand. In regions where Letters of Credit are not available, surety bonds will be utilized in lieu of the bank guarantee.
- **COMPANY AS AGENT**
  If Company makes or arranges for ocean shipment, Company shall act as agent for the Buyer and reserves the right to procure full insurance coverage, including war risk insurance, at the expense of the Buyer. All expenses incurred in this connection will be payable upon demand to the Company. If Company as agent applies for or secures manufacturing, financing, exporting or other licenses required by the United States Government, or any department thereof, Company shall make such applications or secure such licenses solely as agent for the Buyer, and assumes no responsibility therefore.

CANCELLATION SCHEDULE

Planned Shipment (weeks)	Elapsed Time - Date of Order to Date of Cancellation (weeks)																	
	0 to 2	2.01 to 4	4.01 to 6	6.01 to 8	8.01 to 12	12.01 to 16	16.01 to 20	20.01 to 24	24.01 to 28	28.01 to 32	32.01 to 36	36.01 to 40	40.01 to 44	44.01 to 48	48.01 to 52	52.01 to 56	56.01 to 60	60.01 64
Up to 8	20	50	75	100														
8.01 to 12	15	40	60	80	100													
12.01 to 16	10	25	45	60	85	100												
16.01 to 20	10	15	25	45	65	85	100											
20.01 to 24	10	10	20	25	50	70	90	100										
24.01 to 28	10	10	15	20	25	50	70	90	100									
28.01 to 32	10	10	10	15	20	35	60	75	90	100								
32.01 to 36	10	10	10	15	20	25	50	60	85	95	100							
36.01 to 40	10	10	10	10	15	25	50	60	70	85	95	100						
40.01 to 44	10	10	10	10	15	25	45	55	65	80	90	95	100					
44.01 to 48	10	10	10	10	15	25	45	55	60	65	80	90	95	100				
48.01 to 52	10	10	10	10	15	20	40	50	55	60	70	85	90	95	100			
52.01 to 56	10	10	10	10	15	20	35	50	55	60	70	80	85	90	95	100		
Above 56	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Note: The above cancellation rates apply to manufactured equipment only. Any sub-supplier cancellation charges are not reflected above, and would apply accordingly.

* to Be Assigned