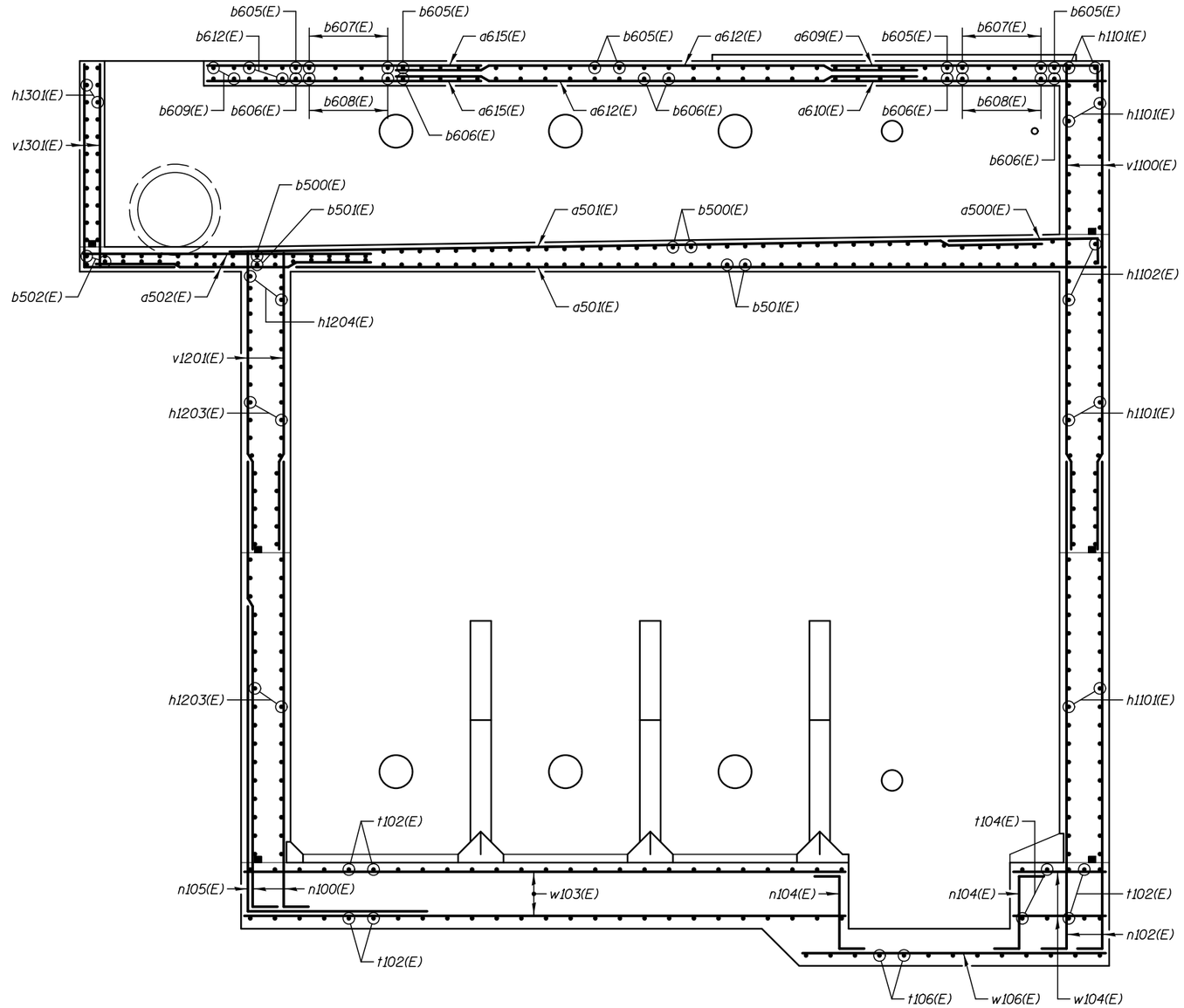


SECTION B-B

PLOT DATE = 6/9/2020

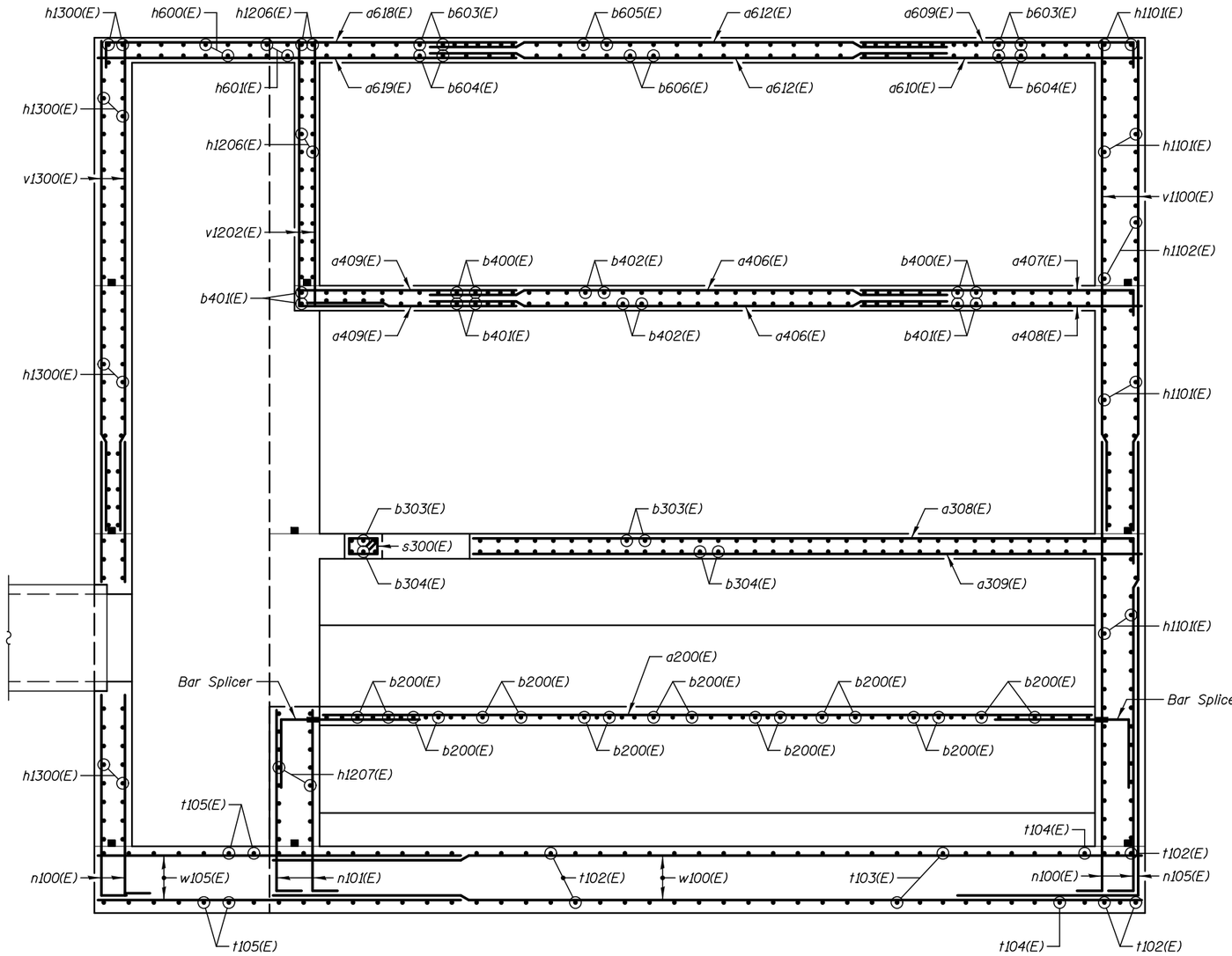
KNIGHT
Engineers & Architects

		DESIGNED - TB	REVISED
		CHECKED - LAS	REVISED
SCALE - NONE		DRAWN - TB	REVISED
DATE - 6/9/2020		CHECKED - LAS	REVISED

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

REINFORCEMENT DETAILS – SECTION B–B
PUMP STATION 38
SHEET NO. SA-22 OF 40 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	201
		CONTRACT NO. 62B65		
	ILLINOIS	FED. AID PROJECT		



SECTION C-C

PLOT DATE = 6/9/2020

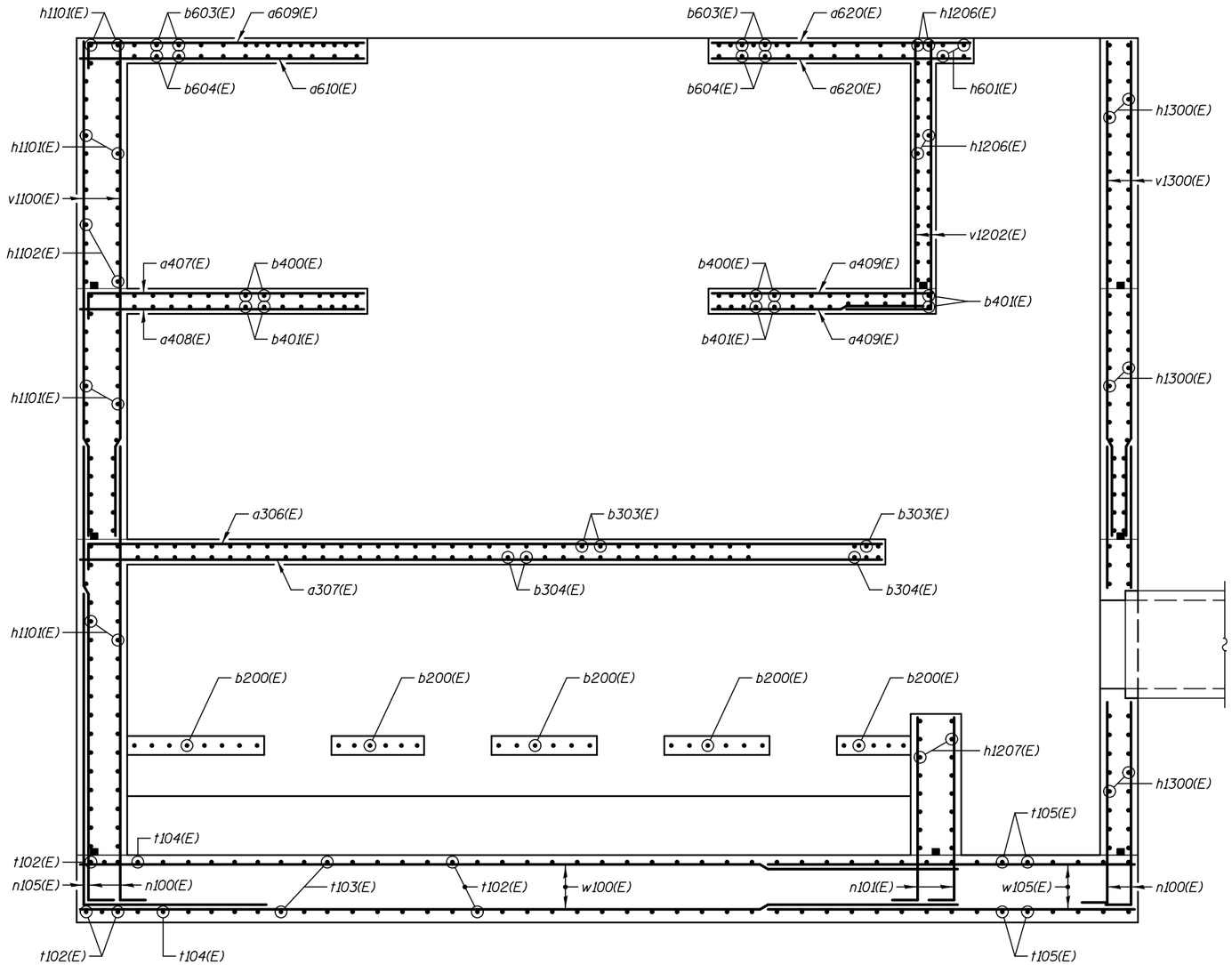
KNIGHT
Engineers & Architects

	DESIGNED - TB	REVISED	
	CHECKED - LAS	REVISED	
SCALE - NONE	DRAWN - TB	REVISED	
DATE - 6/9/2020	CHECKED - LAS	REVISED	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

REINFORCEMENT DETAILS – SECTION C–C
PUMP STATION 38
SHEET NO. SA-23 OF 40 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	202
		CONTRACT NO. 62B65		
	ILLINOIS	FED. AID PROJECT		



SECTION D-D

PLOT DATE = 6/9/2020

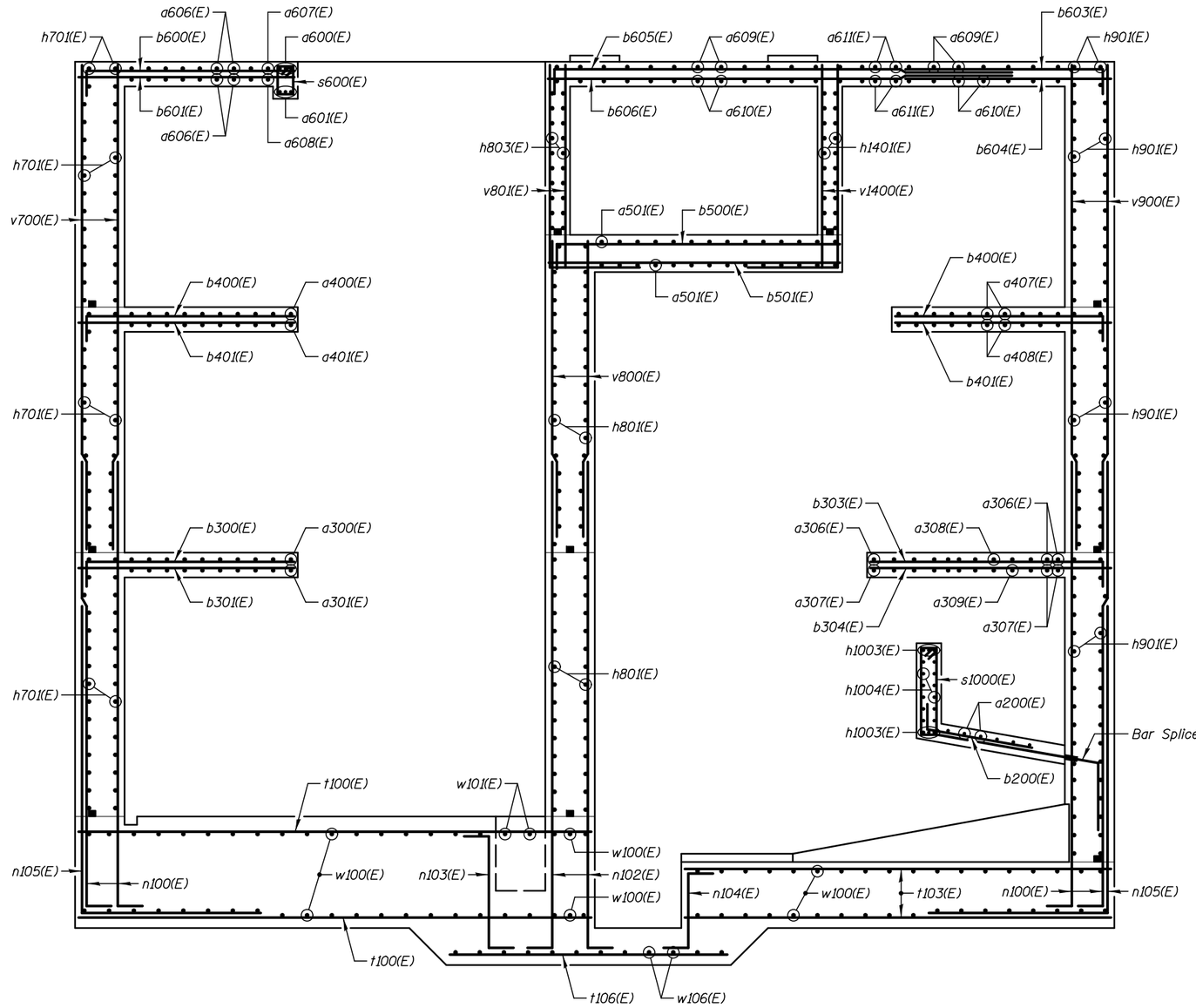
KNIGHT
Engineers & Architects

		DESIGNED - TB	REVISED
		CHECKED - LAS	REVISED
SCALE - NONE		DRAWN - TB	REVISED
DATE - 6/9/2020		CHECKED - LAS	REVISED

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

REINFORCEMENT DETAILS – SECTION D–D
PUMP STATION 38
SHEET NO. SA-24 OF 40 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	203
		CONTRACT NO. 62B65		
	ILLINOIS	FED. AID PROJECT		



SECTION E-E

PLOT DATE = 6/9/2020

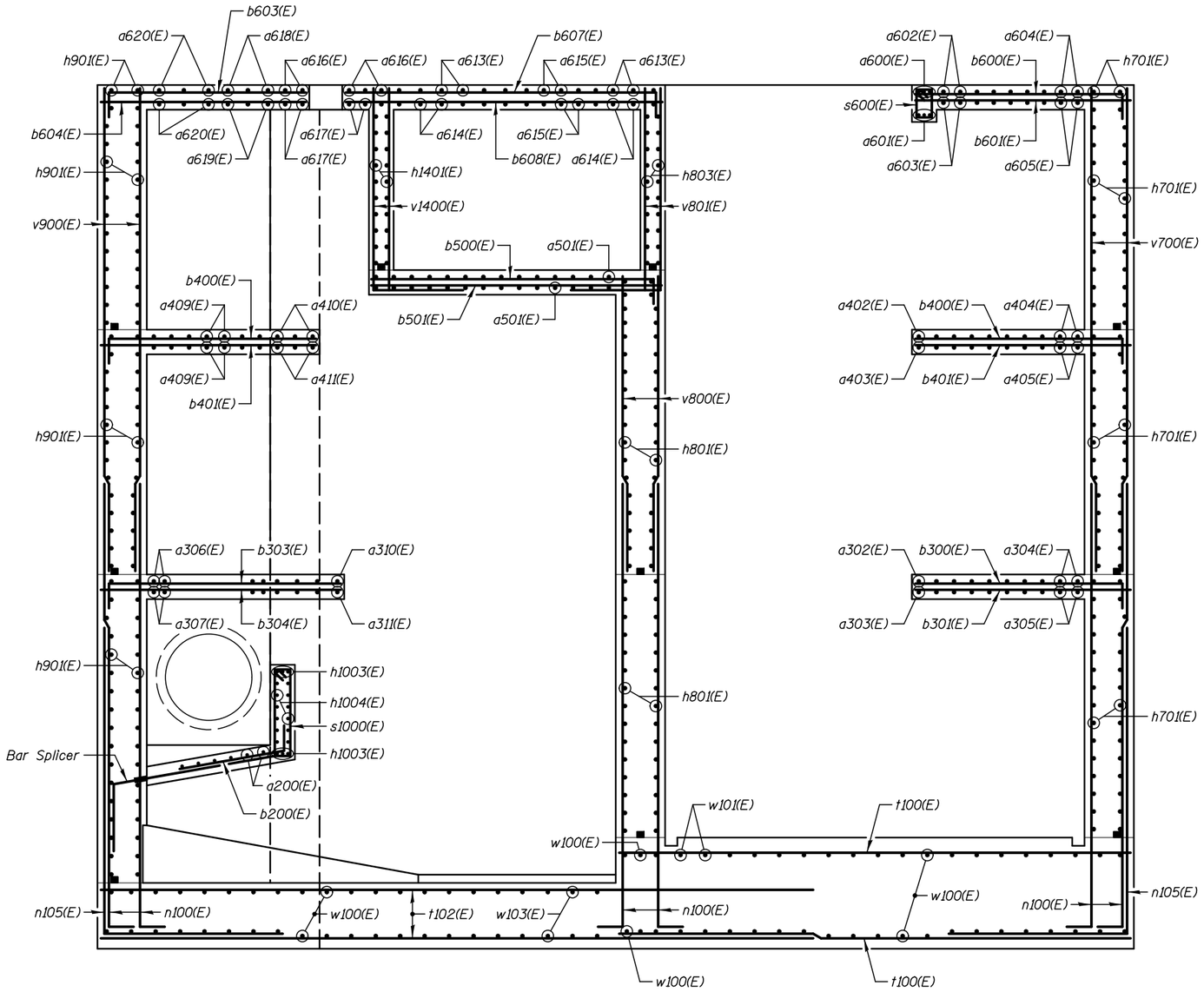
KNIGHT
Engineers & Architects

	DESIGNED - TB	REVISED	
	CHECKED - LAS	REVISED	
SCALE - NONE	DRAWN - TB	REVISED	
DATE - 6/9/2020	CHECKED - LAS	REVISED	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

REINFORCEMENT DETAILS – SECTION E–E
PUMP STATION 38
SHEET NO. SA-25 OF 40 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	204
		CONTRACT NO. 62B65		
	ILLINOIS FED. AID PROJECT			



SECTION F-F

PLOT DATE = 6/9/2020

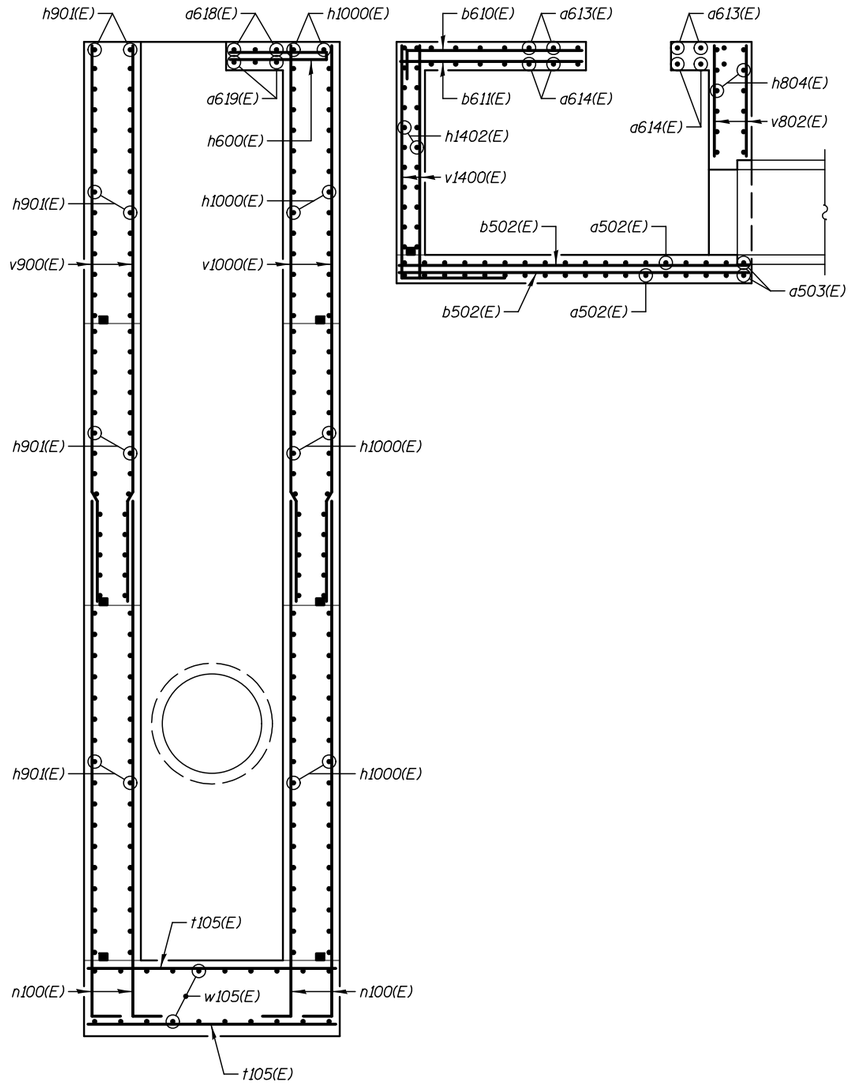
KNIGHT
Engineers & Architects

	DESIGNED - TB	REVISED	
	CHECKED - LAS	REVISED	
SCALE - NONE	DRAWN - TB	REVISED	
DATE - 6/9/2020	CHECKED - LAS	REVISED	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

REINFORCEMENT DETAILS – SECTION F–F
PUMP STATION 38
SHEET NO. SA-26 OF 40 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	205
		CONTRACT NO. 62B65		
	ILLINOIS FED. AID PROJECT			



SECTION G-G

PLOT DATE = 6/9/2020

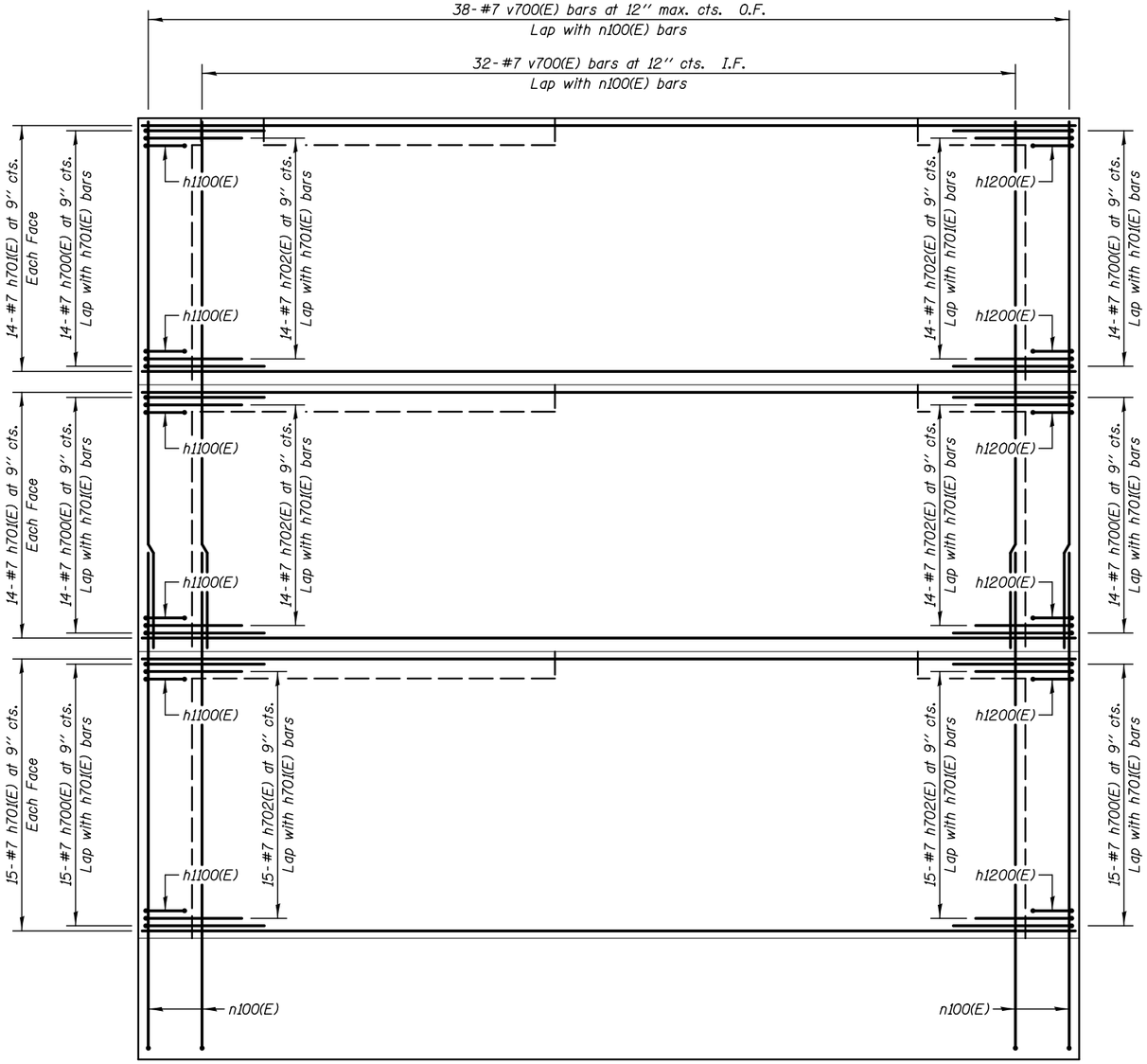
KNIGHT
Engineers & Architects

		DESIGNED - TB	REVISED
		CHECKED - LAS	REVISED
SCALE - NONE		DRAWN - TB	REVISED
DATE - 6/9/2020		CHECKED - LAS	REVISED

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

REINFORCEMENT DETAILS – SECTION G–G
PUMP STATION 38
SHEET NO. SA-27 OF 40 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	206
		CONTRACT NO. 62B65		
	ILLINOIS FED. AID PROJECT			

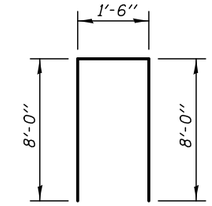


ELEVATION 1

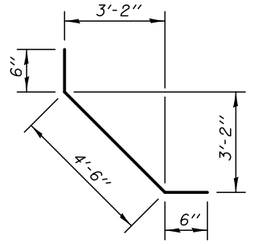
BILL OF MATERIAL

BAR	NO.	SIZE	LENGTH	SHAPE
h700(E)	86	#7	17'-6''	
h701(E)	86	#7	34'-8''	
h702(E)	86	#7	5'-6''	
v700(E)	70	#7	19'-6''	
Reinforcement Bars, Epoxy Coated			Pound	12930

Work this sheet with sheet SA-36.



BAR h700(E)



BAR h702(E)

PLOT DATE = 6/9/2020

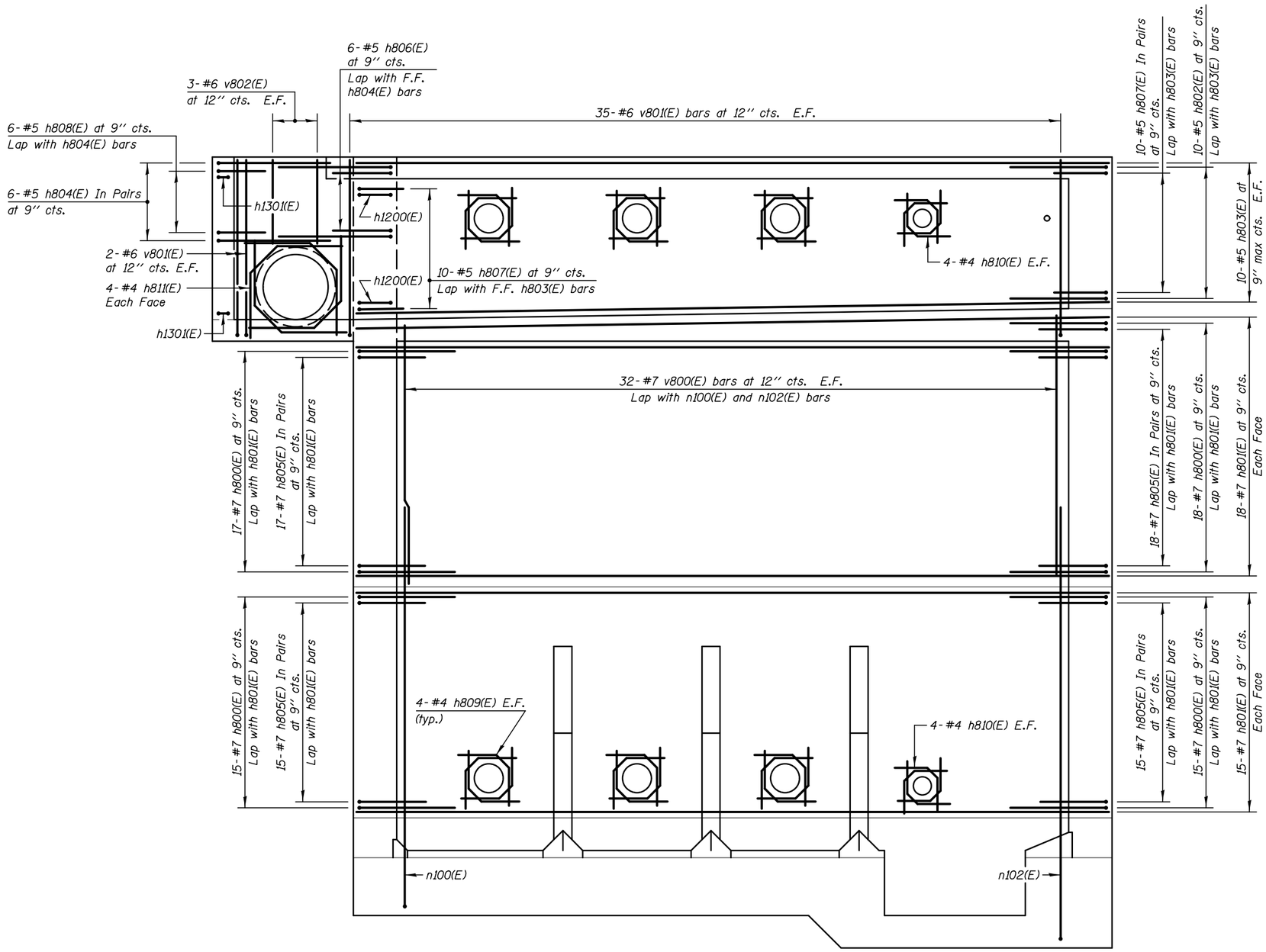
KNIGHT
Engineers & Architects

	DESIGNED - TB	REVISED	
	CHECKED - LAS	REVISED	
SCALE - NONE	DRAWN - TB	REVISED	
DATE - 6/9/2020	CHECKED - LAS	REVISED	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

REINFORCEMENT DETAILS – ELEVATION 1
PUMP STATION 38
SHEET NO. SA-28 OF 40 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	207
		CONTRACT NO. 62B65		
	ILLINOIS	FED. AID PROJECT		



Note

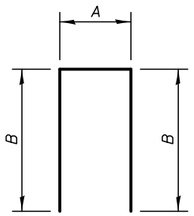
Cut n100(E), n102(E) & v801(E), as required, to clear pipe.

ELEVATION 2

BILL OF MATERIAL

BAR	NO.	SIZE	LENGTH	SHAPE
h800(E)	65	#7	17'-6''	
h801(E)	66	#7	34'-8''	
h802(E)	10	#5	9'-7''	
h803(E)	20	#5	34'-8''	
h804(E)	12	#5	13'-7''	
h805(E)	130	#7	5'-6''	
h806(E)	6	#5	4'-10''	
h807(E)	30	#5	4'-1''	
h808(E)	6	#5	3'-6''	
h809(E)	48	#4	4'-4''	
h810(E)	16	#4	3'-8''	
h811(E)	8	#4	7'-9''	
v800(E)	64	#7	12'-0''	
v801(E)	74	#6	13'-2''	
v802(E)	6	#6	3'-10''	
Reinforcement Bars, Epoxy Coated			Pound	12930

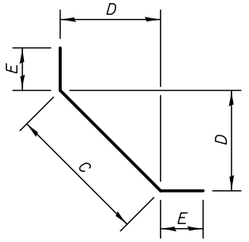
Work this sheet with sheet SA-36.



A & B DIMENSIONS

BAR	A	B
h800(E)	1'-6''	8'-0''
h802(E)	7''	4'-6''
h804(E)	1'-1''	6'-3''

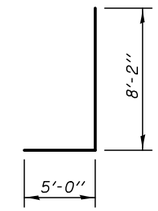
BARS h800(E), h802(E) & h804(E)



C, D & E DIMENSIONS

BAR	C	D	E
h805(E)	4'-6''	3'-2''	6''
h806(E)	3'-10''	2'-8½''	6''
h807(E)	3'-1''	2'-2''	6''
h808(E)	2'-6''	1'-9''	6''
h809(E)	10''	7''	1'-9''
h810(E)	8''	5½''	1'-6''
h811(E)	1'-9''	1'-3''	3'-0''

BARS h805(E), h806(E), h807(E), h808(E), h809(E), h810(E) & h811(E)



BAR v801(E)

PLOT DATE = 6/9/2020

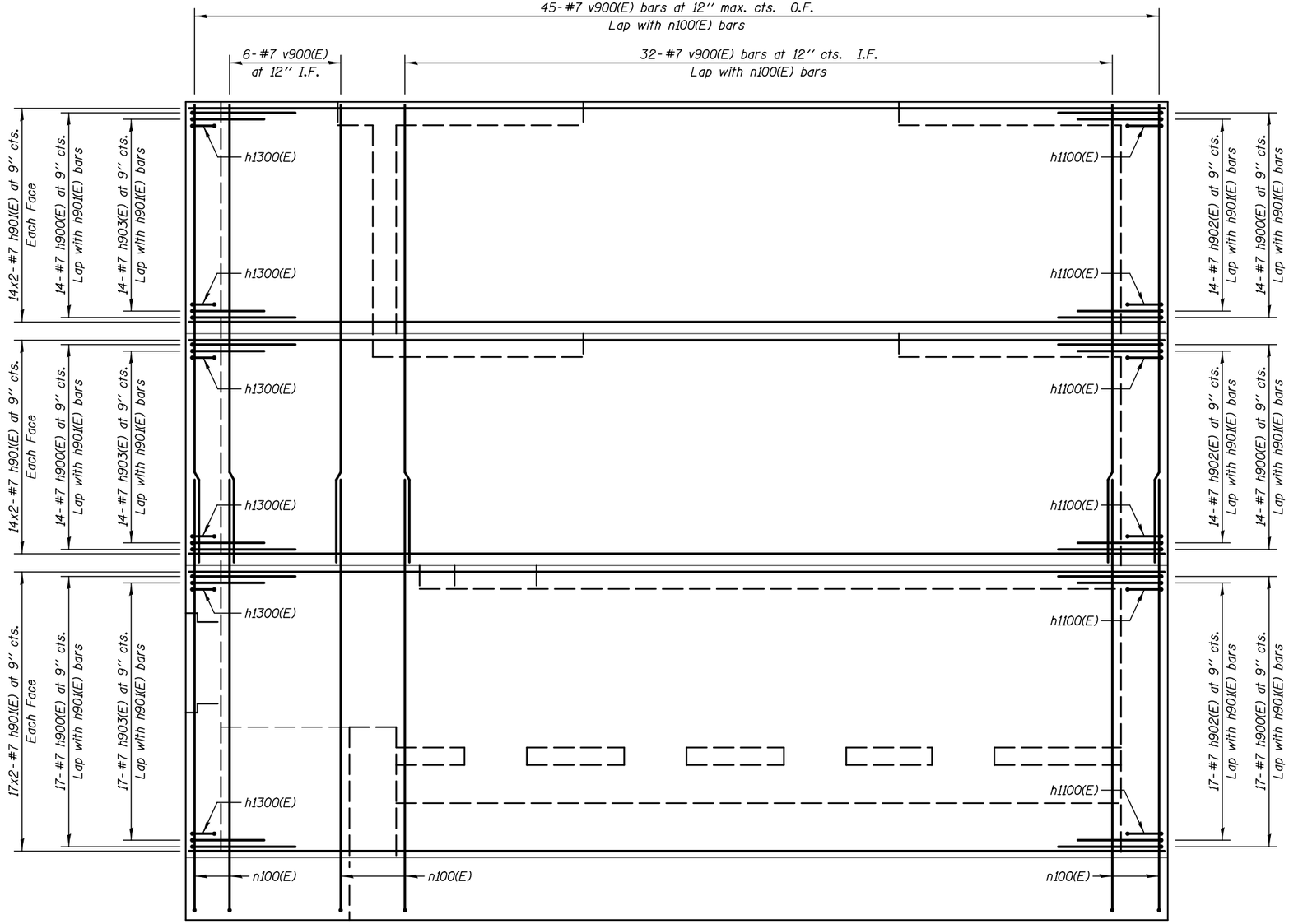
KNIGHT Engineers & Architects

		DESIGNED - TB	REVISED
		CHECKED - LAS	REVISED
SCALE - NONE		DRAWN - TB	REVISED
DATE - 6/9/2020		CHECKED - LAS	REVISED

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

REINFORCEMENT DETAILS – ELEVATION 2
PUMP STATION 38
SHEET NO. SA-29 OF 40 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	208
		CONTRACT NO. 62B65		
	ILLINOIS	FED. AID PROJECT		

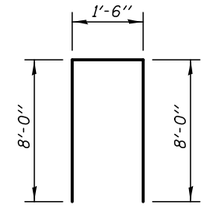


ELEVATION 3

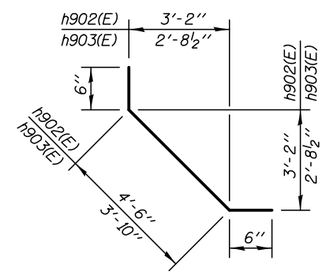
BILL OF MATERIAL

BAR	NO.	SIZE	LENGTH	SHAPE
h900(E)	90	#7	17'-6''	
h901(E)	180	#7	25'-0''	
h902(E)	45	#7	5'-6''	
h903(E)	45	#7	4'-10''	
v900(E)	83	#7	19'-6''	
Reinforcement Bars, Epoxy Coated			Pound	16680

Work this sheet with sheet SA-36.



BAR h900(E)



BARS h902(E) & h903(E)

Notes:
Bars indicated thus 5x2-#5 etc. indicates 5 lines of bars with 2 lengths per line.

PLOT DATE = 6/9/2020

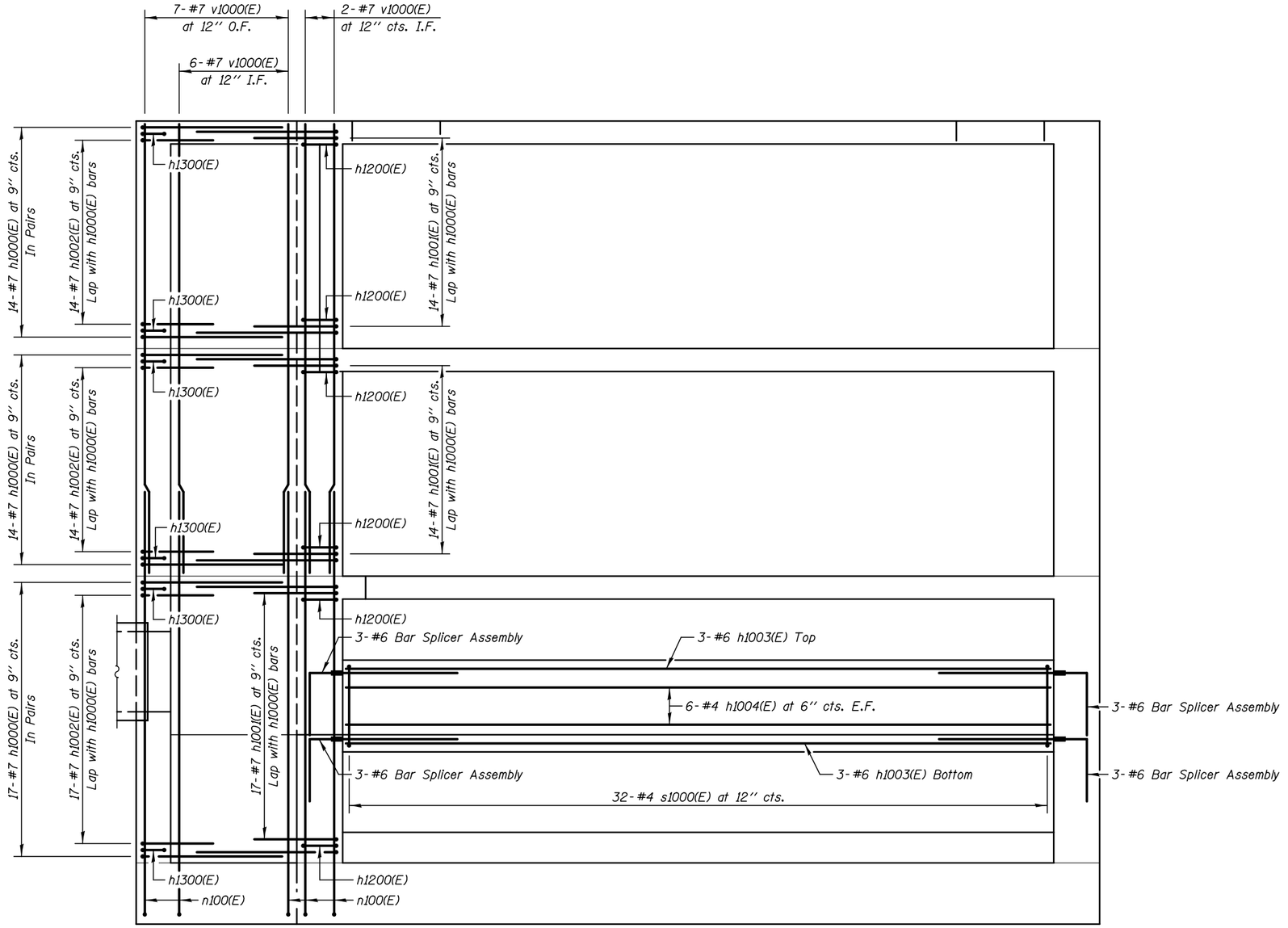
KNIGHT
Engineers & Architects

	DESIGNED - TB	REVISED	
	CHECKED - LAS	REVISED	
SCALE - NONE	DRAWN - TB	REVISED	
DATE - 6/9/2020	CHECKED - LAS	REVISED	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

REINFORCEMENT DETAILS – ELEVATION 3
PUMP STATION 38
SHEET NO. SA-30 OF 40 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	209
		CONTRACT NO. 62B65		
	ILLINOIS	FED. AID PROJECT		

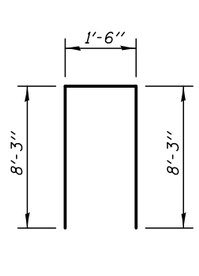


ELEVATION 4

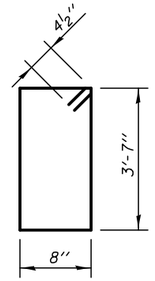
BILL OF MATERIAL

BAR	NO.	SIZE	LENGTH	SHAPE
h1000(E)	90	#7	18'-0''	
h1001(E)	45	#7	5'-6''	
h1002(E)	45	#7	4'-10''	
h1003(E)	6	#6	30'-8''	
h1004(E)	12	#4	30'-8''	
s1000(E)	32	#4	9'-3''	
v1000(E)	15	#7	19'-6''	
Reinforcement Bars, Epoxy Coated			Pound	5580
Bar Splicers			Each	12

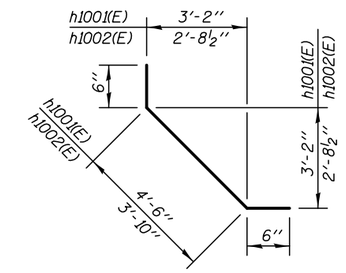
Work this sheet with sheet SA-36.



BAR h1000(E)



BAR s1000(E)



BARs h1001(E) & h1002(E)

Notes:

See Sheet SA-36 for Bar Splicer Assembly details.

PLOT DATE = 6/9/2020

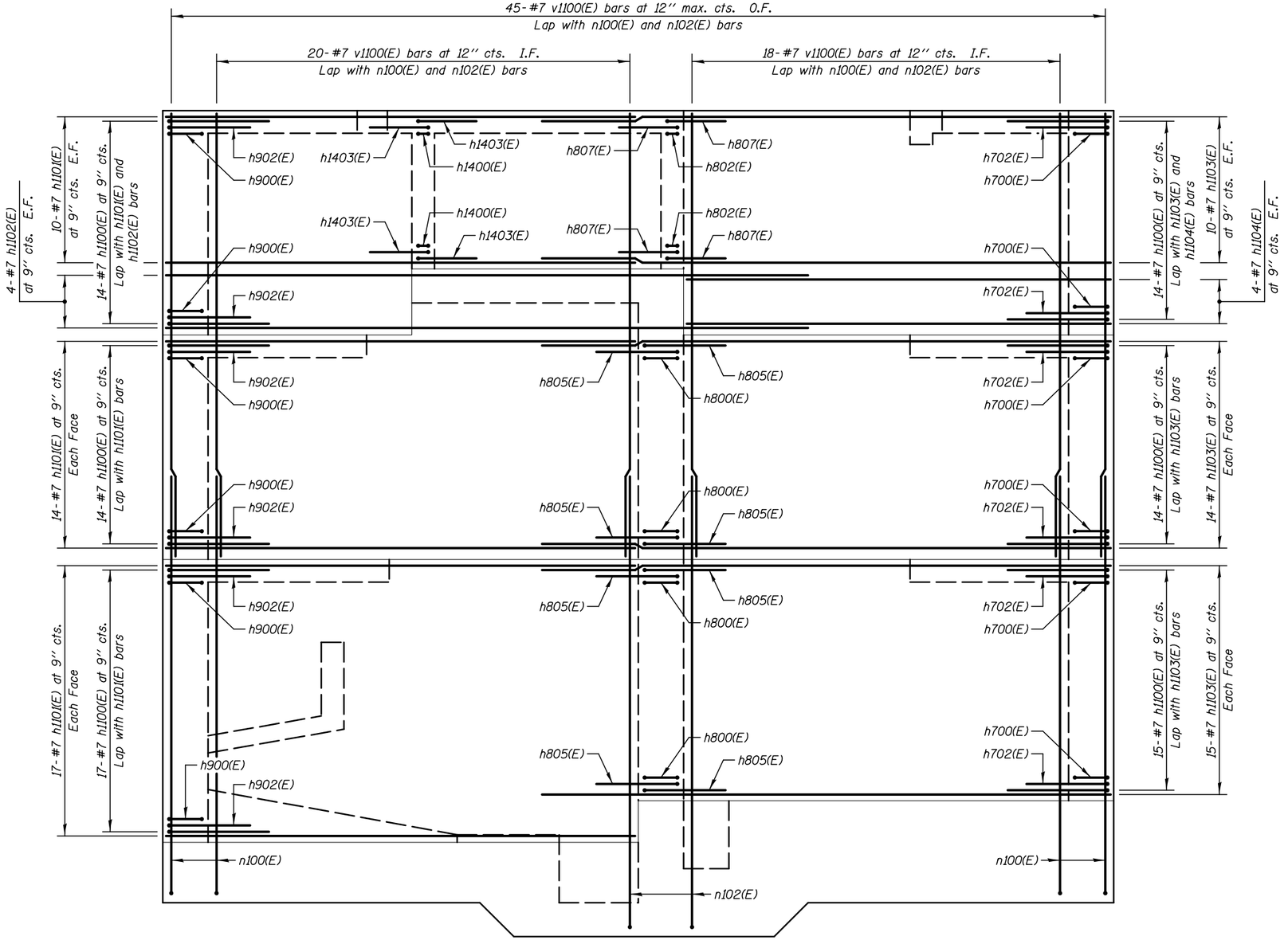
KNIGHT
Engineers & Architects

	DESIGNED - TB	REVISED	
	CHECKED - LAS	REVISED	
SCALE - NONE	DRAWN - TB	REVISED	
DATE - 6/9/2020	CHECKED - LAS	REVISED	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

REINFORCEMENT DETAILS – ELEVATION 4
PUMP STATION 38
SHEET NO. SA-31 OF 40 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	210
		CONTRACT NO. 62B65		
	ILLINOIS FED. AID PROJECT			

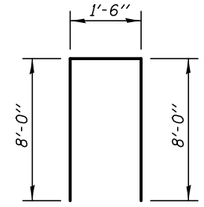


ELEVATION 5

BILL OF MATERIAL

BAR	NO.	SIZE	LENGTH	SHAPE
h1100(E)	88	#7	17'-6''	
h1101(E)	82	#7	20'-8''	
h1102(E)	8	#7	31'-0''	
h1103(E)	78	#7	29'-0''	
h1104(E)	8	#7	18'-8''	
v1100(E)	83	#7	19'-6''	
Reinforcement Bars, Epoxy Coated			Pound	15360

Work this sheet with sheet SA-36.



BAR h1100(E)

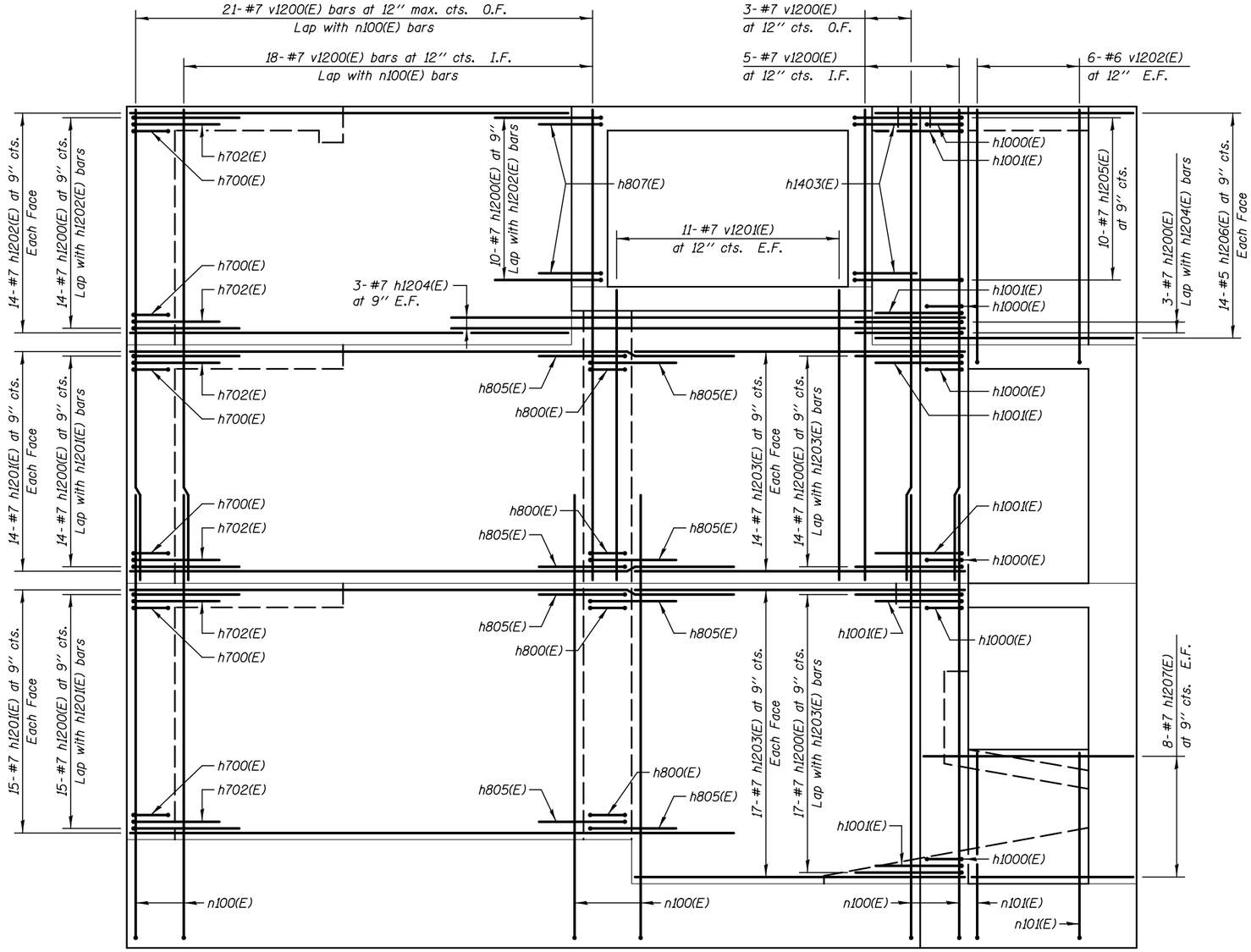
PLOT DATE = 6/9/2020

KNIGHT Engineers & Architects		DESIGNED - TB	REVISED
		CHECKED - LAS	REVISED
	SCALE - NONE	DRAWN - TB	REVISED
	DATE - 6/9/2020	CHECKED - LAS	REVISED

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

REINFORCEMENT DETAILS – ELEVATION 5
PUMP STATION 38
SHEET NO. SA-32 OF 40 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	211
		CONTRACT NO. 62B65		
	ILLINOIS FED. AID PROJECT			

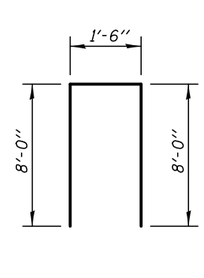


ELEVATION 6

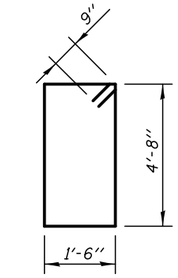
BILL OF MATERIAL

BAR	NO.	SIZE	LENGTH	SHAPE
h1200(E)	87	#7	17'-6''	
h1201(E)	58	#7	29'-0''	
h1202(E)	28	#7	18'-2''	
h1203(E)	62	#7	13'-8''	
h1204(E)	6	#7	24'-6''	
h1205(E)	10	#7	13'-10''	
h1206(E)	28	#5	10'-8''	
h1207(E)	16	#7	8'-8''	
v1200(E)	47	#7	19'-6''	
v1201(E)	22	#7	12'-0''	
v1202(E)	12	#6	15'-7''	
Reinforcement Bars, Epoxy Coated			Pound	13200

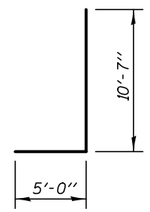
Work this sheet with sheet SA-36.



BAR h1200(E)



BAR h1205(E)



BAR v1202(E)

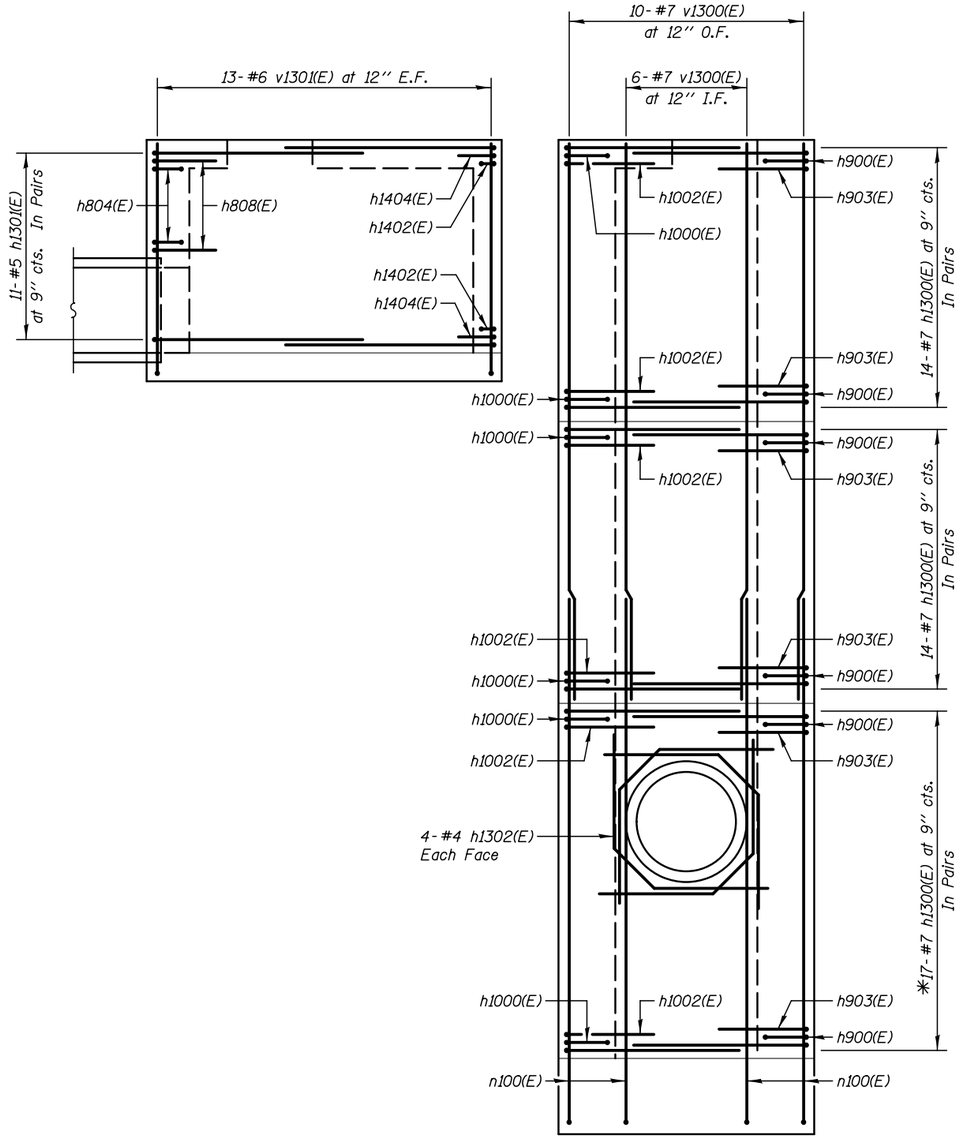
PLOT DATE = 6/9/2020

KNIGHT Engineers & Architects		DESIGNED - TB	REVISED
		CHECKED - LAS	REVISED
	SCALE - NONE	DRAWN - TB	REVISED
	DATE - 6/9/2020	CHECKED - LAS	REVISED

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

REINFORCEMENT DETAILS – ELEVATION 6
PUMP STATION 38
SHEET NO. SA-33 OF 40 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	212
		CONTRACT NO. 62B65		
	ILLINOIS	FED. AID PROJECT		



Note

Cut n100(E), as required, to clear pipe.

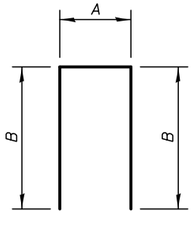
*Cut h1300(E), as required, to clear pipe.

ELEVATION 7

BILL OF MATERIAL

BAR	NO.	SIZE	LENGTH	SHAPE
h1300(E)	90	#7	17'-6"	
h1301(E)	22	#5	17'-1"	
h1302(E)	8	#4	10'-0"	
v1300(E)	16	#7	19'-6"	
v1301(E)	26	#6	13'-2"	
Reinforcement Bars, Epoxy Coated			Pound	4820

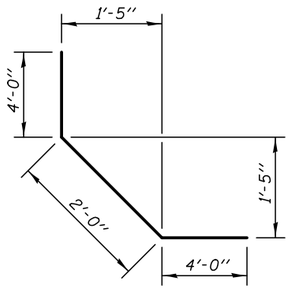
Work this sheet with sheet SA-36.



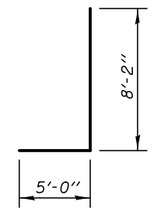
A & B DIMENSIONS

BAR	A	B
h1300(E)	1'-0"	8'-3"
h1301(E)	7"	8'-3"

BARS h1300(E) & h1301(E)



BAR h1302(E)



BAR v1301(E)

PLOT DATE = 6/9/2020

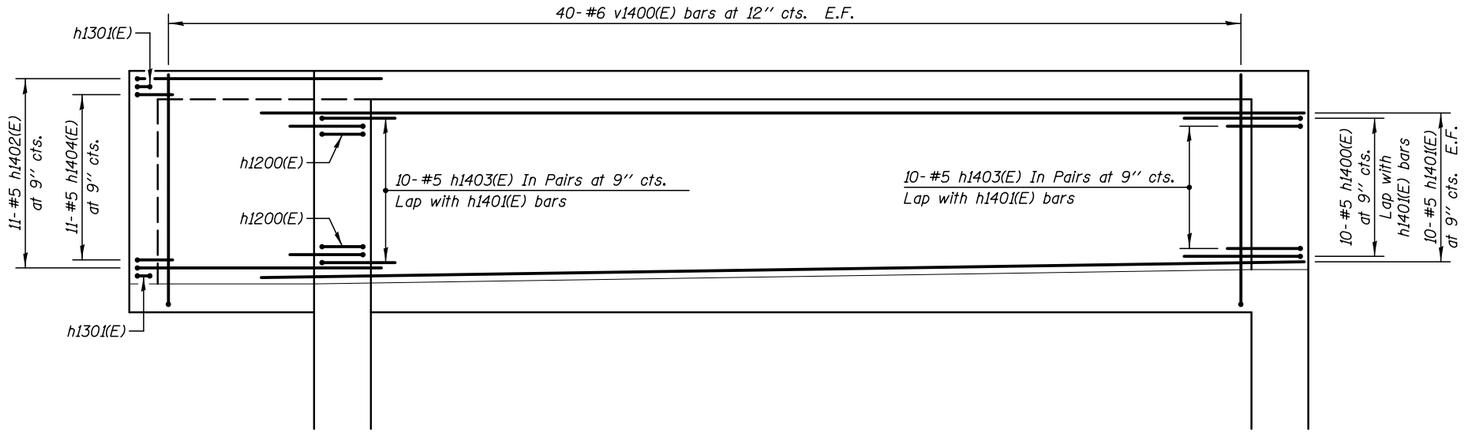
KNIGHT Engineers & Architects

		DESIGNED - TB	REVISED
		CHECKED - LAS	REVISED
SCALE - NONE		DRAWN - TB	REVISED
DATE - 6/9/2020		CHECKED - LAS	REVISED

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

REINFORCEMENT DETAILS – ELEVATION 7
PUMP STATION 38
SHEET NO. SA-34 OF 40 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	213
		CONTRACT NO. 62B65		
	ILLINOIS	FED. AID PROJECT		

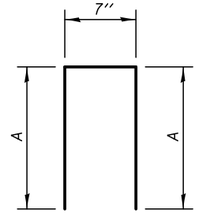


ELEVATION 8

BILL OF MATERIAL

BAR	NO.	SIZE	LENGTH	SHAPE
h1400(E)	10	#5	9'-7''	
h1401(E)	20	#5	37'-0''	
h1402(E)	11	#5	17'-7''	
h1403(E)	40	#5	4'-1''	
h1404(E)	11	#5	2'-10''	
v1400(E)	80	#6	13'-2''	
Reinforcement Bars, Epoxy Coated			Pound	2860

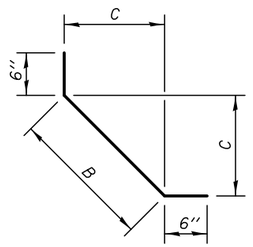
Work this sheet with sheet SA-36.



A DIMENSION

BAR	A
h1400(E)	4'-6''
h1402(E)	8'-6''

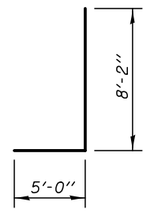
BARS h1400(E) & h1402(E)



B & C DIMENSIONS

BAR	B	C
h1403(E)	3'-1''	2'-2''
h1404(E)	1'-10''	1'-3½''

BARS h1403(E) & h1404(E)



BAR v1400(E)

PLOT DATE = 6/9/2020

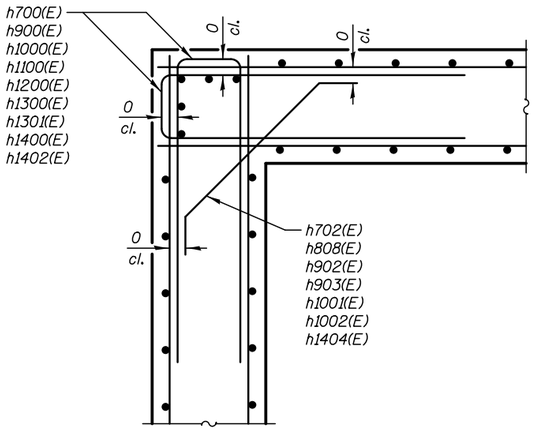
KNIGHT
Engineers & Architects

		DESIGNED - TB	REVISED
		CHECKED - LAS	REVISED
SCALE - NONE		DRAWN - TB	REVISED
DATE - 6/9/2020		CHECKED - LAS	REVISED

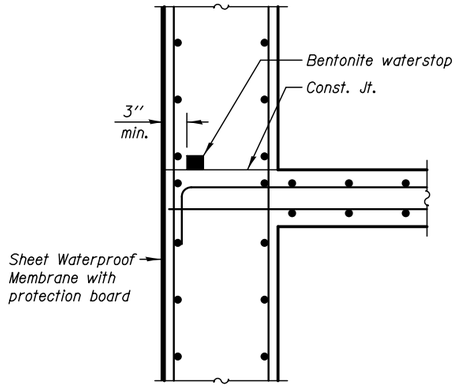
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

REINFORCEMENT DETAILS – ELEVATION 8
PUMP STATION 38
SHEET NO. SA-35 OF 40 SHEETS

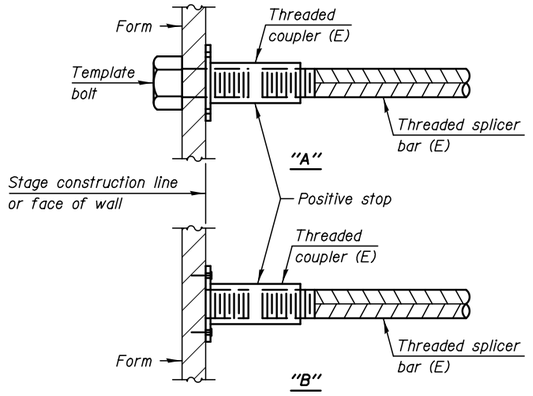
F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	214
		CONTRACT NO. 62B65		
	ILLINOIS	FED. AID PROJECT		



TYPICAL CORNER DETAIL

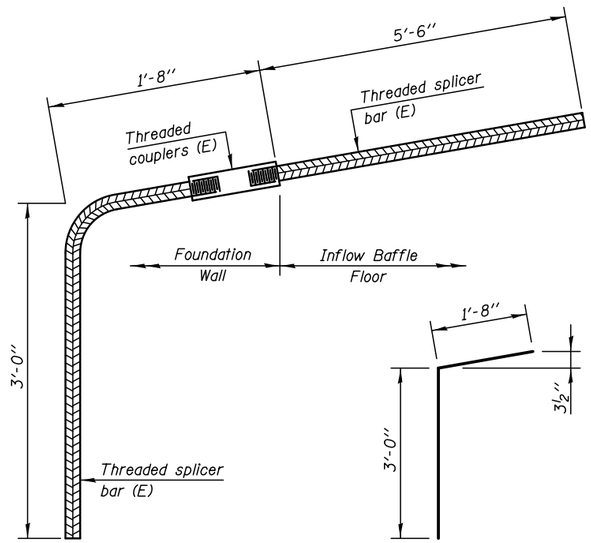


TYPICAL WATERSTOP DETAIL



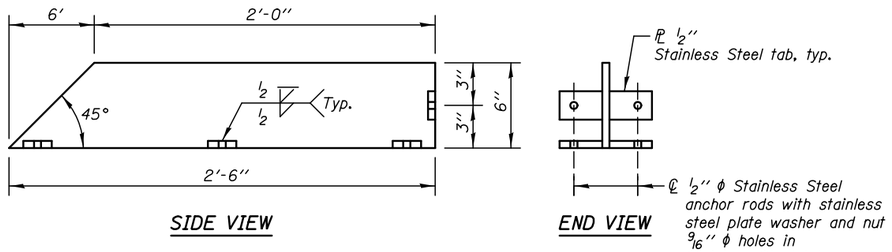
INSTALLATION AND SETTING METHODS

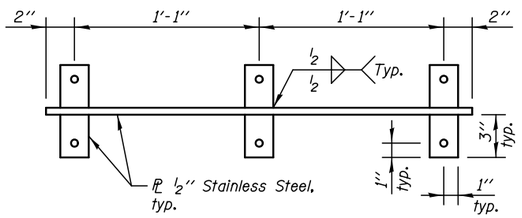
"A" : Set bar splicer assembly by means of a template bolt.
"B" : Set bar splicer assembly by nailing to wood forms or cementing to steel forms.
(E) : Indicates epoxy coating.



BAR SPLICER ASSEMBLY

No. required = 31
West Wall Only





VORTEX PLATE

Vortex Plate Notes:

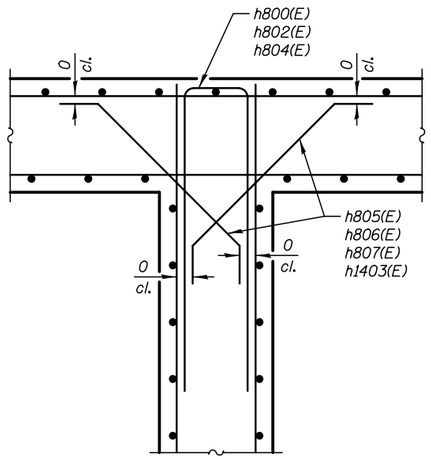
Drill and set ½" ϕ Stainless Steel anchor rods according to Article 509.06 of the Standard Specifications. Embedment shall be 6".

Stainless Steel plates and washers shall be ASTM A240, Type 304

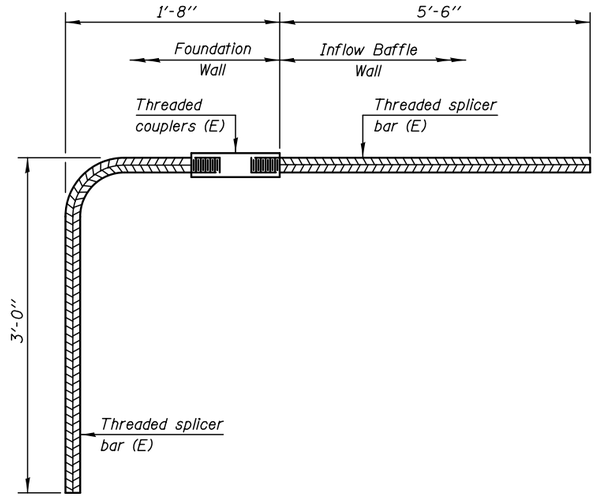
Stainless Steel nuts shall be ASTM F594, Type 304

Stainless Steel anchor rods shall be AISI Type 304

Cost of all components of the Vortex Plate, including, but not limited to, plates, anchor rods, plate washers and nuts are included in the cost of "Pump Station Mechanical Work".



TYPICAL WALL INTERSECTION DETAIL



BAR SPLICER ASSEMBLY

No. required = 24

Bar Splicer Assembly Notes:

Splicer bars shall be deformed with threaded ends and have a minimum 60 ksi yield strength.

All reinforcement shall be lapped and tied to the splicer bars.

Bar splicer assemblies shall be epoxy coated according to the requirements for reinforcement bars. See Section 508 of the Standard Specifications.

See approved list of bar splicer assemblies for alternatives.

See Sheets SA-16 and SA-31 for bar splicer locations.

PLOT DATE = 6/9/2020

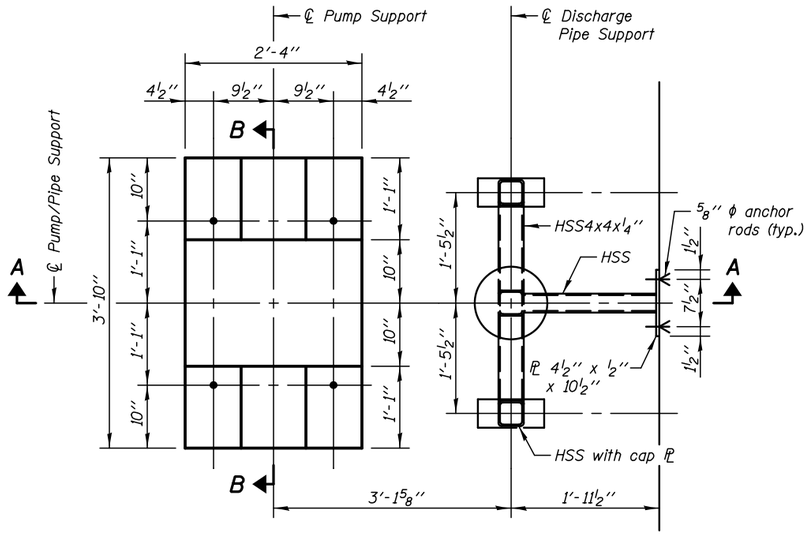
KNIGHT
Engineers & Architects

	DESIGNED - TB	REVISED	
	CHECKED - LAS	REVISED	
SCALE - NONE	DRAWN - TB	REVISED	
DATE - 6/9/2020	CHECKED - LAS	REVISED	

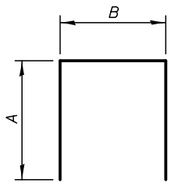
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

STRUCTURAL DETAILS
PUMP STATION 38
SHEET NO. SA-36 OF 40 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	215
		CONTRACT NO. 62B65		
	ILLINOIS FED. AID PROJECT			



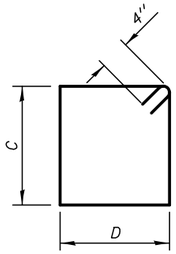
PLAN



A & B DIMENSIONS

BAR	A	B
U(E)	2'-6"	3'-6"
U1(E)	2'-6"	2'-0"
U2(E)	1'-6"	9"

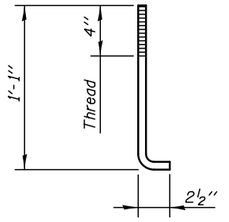
BARS U(E), U1(E) & U2(E)



C & D DIMENSIONS

BAR	C	D
S(E)	4"	2'-0"
S1(E)	3'-7"	2'-1"
S2(E)	10"	2'-1"
S3(E)	10"	6"

BARS S(E), S1(E), S2(E) & S3(E)



⅝" DIA. ANCHOR BOLT

(Stainless Steel, Type 304)
(4 Each Location)

DESIGN STRESSES

REINFORCED CONCRETE

f'_c = Compressive Strength of Concrete at 14 Days = 5,000 psi
f_y = Reinforcement Bars (Grade 75) = 75,000 psi
f_y = Structural Steel, Plates (AASHTO M270 Grade 36) = 36,000 psi
f_y = Structural Steel, HSS (ASTM A500 Grade B) = 46,000 psi

NOTES

The pump supports shall be precast. Cast-in-place is not an option.

See Sheet SA-38 for Bill of Material.

All vertical HSS are HSS4x4x¼" U.N.O
All horizontal HSS are HSS3x3x¼" U.N.O

Drill and set ⅝" ϕ S.S. anchor rods according to Article 509.06 of the Standard Specifications. Embedment shall be 6".

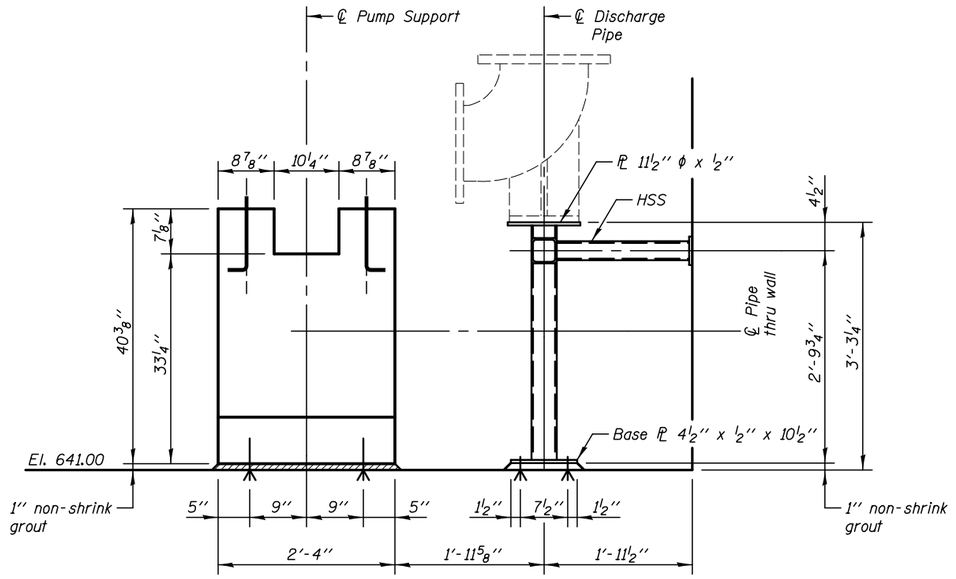
Coordinate dimensions of pump/pipe support with pump manufacturer prior to fabrication of support.

Coordinate anchor bolt location in pump support with pump base.

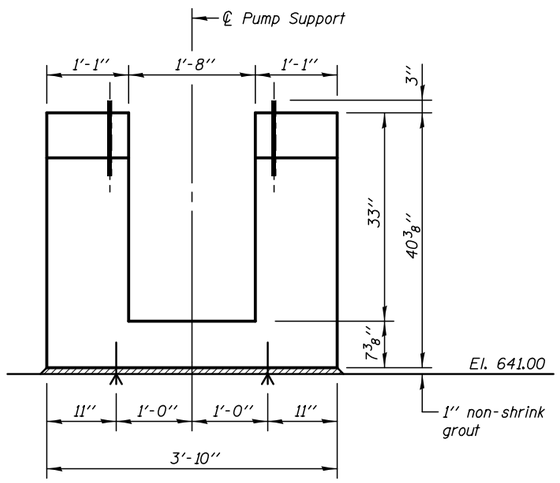
All steel to be Hot-Dipped Galvanized after fabrication.

Cost of Pump Support and Discharge Pipe Support included in the cost of "Pump Station Mechanical Work".

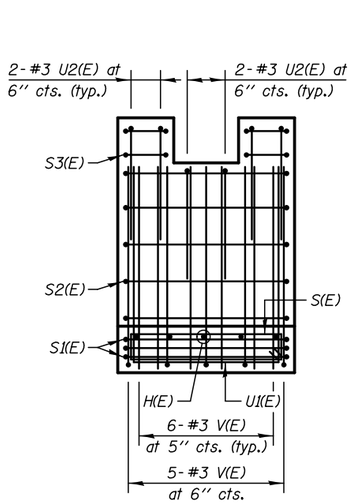
Pump and piping support drawings have been prepared based on the weights and dimensions of specific manufacturers for the basis of design. The Contractor shall be responsible for verifying with the approved pump manufacturer that the pump and piping support system as constructed is suitable for the particular make and models of pumps to be installed and shall provide certification of suitability from the pump manufacturer. If required by the pump manufacturer, the Contractor shall provide alternative pump and piping supports at no additional cost to the owner. Alternatives shall fit into the allocated spaces with suitable clearance. The design of alternative pump and piping supports shall be signed and sealed by a Structural Engineer licensed in the State of Illinois and be submitted to the Engineer for approval along with certification of suitability from the pump manufacturer.



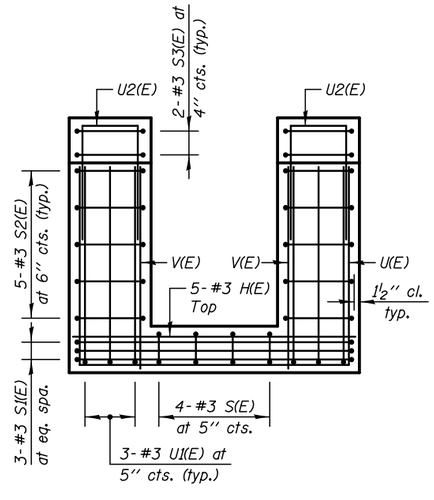
SECTION A-A



SECTION B-B



SECTION A-A
(showing reinforcement)



SECTION B-B
(showing reinforcement)

PUMP SUPPORT - MAIN PUMP
(3 Locations)

PLOT DATE = 6/9/2020

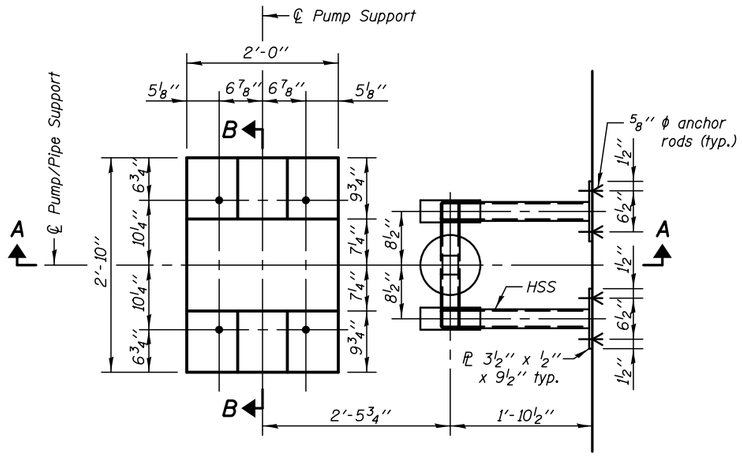
KNIGHT
Engineers & Architects

		DESIGNED - TB	REVISED
		CHECKED - LAS	REVISED
SCALE - NONE		DRAWN - TB	REVISED
DATE - 6/9/2020		CHECKED - LAS	REVISED

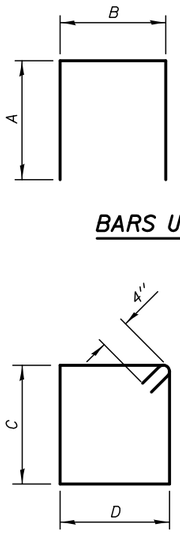
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

PUMP SUPPORT DETAILS – MAIN PUMP
PUMP STATION 38
SHEET NO. SA-37 OF 40 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	216
		CONTRACT NO. 62B65		
	ILLINOIS FED. AID PROJECT			



PLAN



A & B DIMENSIONS

BAR	A	B
U10(E)	1'-8"	2'-6"
U11(E)	1'-8"	1'-8"
U12(E)	1'-4"	6"

BARS U10(E), U11(E) & U12(E)

C & D DIMENSIONS

BAR	C	D
S10(E)	3"	1'-8"
S11(E)	2'-7"	1'-9"
S12(E)	7"	1'-9"
S13(E)	7"	5"

BARS S10(E), S11(E), S12(E) & S13(E)

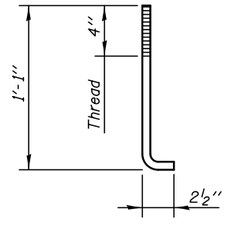
BILL OF MATERIAL
MAIN PUMP - 1 LOCATION
(For Information Only)

BAR	NO.	SIZE	LENGTH	SHAPE
H(E)	5	#3	3'-7"	
S(E)	4	#3	5'-4"	
S1(E)	3	#3	12'-0"	
S2(E)	10	#3	6'-6"	
S3(E)	8	#3	3'-4"	
U(E)	5	#3	8'-6"	
U1(E)	6	#3	7'-0"	
U2(E)	12	#3	3'-9"	
V(E)	12	#3	2'-6"	
Reinforcement Bars, Epoxy Coated			Pound	130
Concrete Structures			Cu. Yd.	0.7

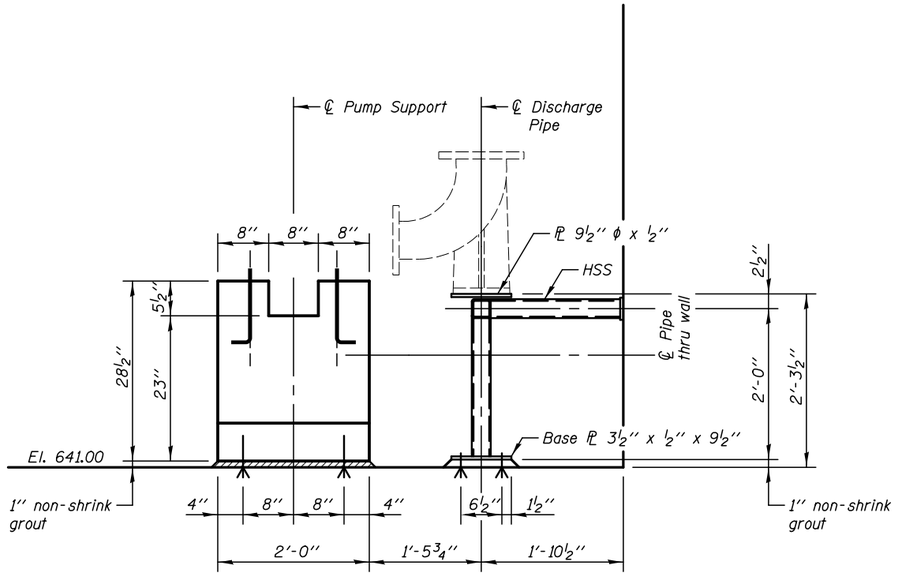
BILL OF MATERIAL
LOW FLOW PUMP - 1 LOCATION
(For Information Only)

BAR	NO.	SIZE	LENGTH	SHAPE
H10(E)	4	#3	2'-7"	
S10(E)	3	#3	4'-6"	
S11(E)	2	#3	9'-4"	
S12(E)	8	#3	5'-4"	
S13(E)	8	#3	2'-8"	
U10(E)	5	#3	5'-10"	
U11(E)	4	#3	5'-0"	
U12(E)	12	#3	3'-2"	
V10(E)	12	#3	1'-8"	
Reinforcement Bars, Epoxy Coated			Pound	90
Concrete Structures			Cu. Yd.	0.3

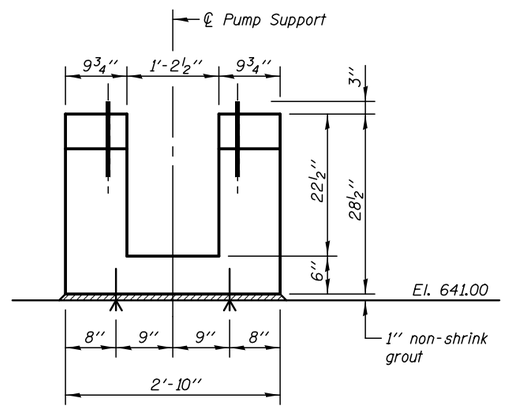
NOTES
See Sheet SA-37 for additional notes.



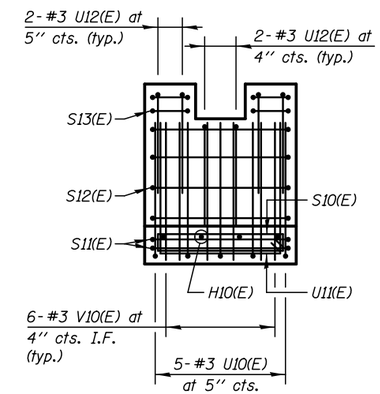
⅝" DIA. ANCHOR BOLT
(Stainless Steel, Type 304)
(4 Each Location)



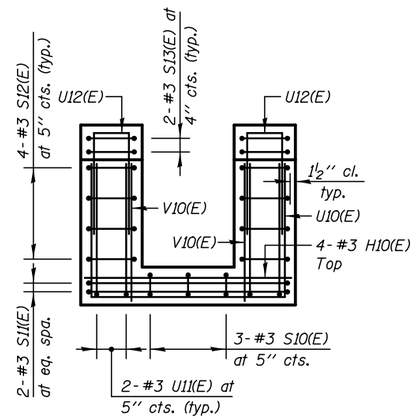
SECTION A-A



SECTION B-B



SECTION A-A
(showing reinforcement)



SECTION B-B
(showing reinforcement)

PUMP SUPPORT - LOW FLOW PUMP
(1 Location)

PLOT DATE = 6/9/2020

KNIGHT
Engineers & Architects

		DESIGNED - TB	REVISED
		CHECKED - LAS	REVISED
SCALE - NONE		DRAWN - TB	REVISED
DATE - 6/9/2020		CHECKED - LAS	REVISED

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

PUMP SUPPORT DETAILS – LOW FLOW PUMP
PUMP STATION 38
SHEET NO. SA-38 OF 40 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	217
		CONTRACT NO. 62B65		
	ILLINOIS FED. AID PROJECT			

Geo Services, Inc.
Geotechnical, Environmental & Civil Engineering
805 Amherst Court, Suite 204
Naperville, Illinois 60565
(630) 355-2828

SOIL BORING LOG

GSI Job No. 16017
Page 1 of 3
Date 9/5/17

ROUTE FAP 346 DESCRIPTION Pump Station LOGGED BY JT
SECTION LOCATION SW 1/4, SEC. 32, TWP. T44N, RNG. R12E, 3rd PM
COUNTY Lake DRILLING METHOD Hollow Stem Auger/Rotary HAMMER TYPE CME Automatic

STRUCT. NO.
Station
BORING NO. PS-01
Station 53+94
Offset 57.70ft Right
Ground Surface Elev. 670.50 ft

Surface Water Elev. n/a ft
Stream Bed Elev. n/a ft
Groundwater Elev.:
First Encounter Dry to -10.0 ft
Upon Completion n/a ft
After 24 Hrs. - ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material
				8.0" TOPSOIL with Stone-black 669.83
	5		12	SANDY CLAY LOAM with Stone-dark brown & black-medium dense (Fill)
	6		11	
	5			
				667.50
				SILTY CLAY-brown & gray hard
	3			
-5	5	4.2	24	
	7	B		
				665.00
				CLAY-brown-stiff to hard
	3			
	5	5.5	19	
	7	B		
	3			
-10	8	7.9	16	
	12	B		
				becoming gray @ -10.5'
	5			
	8	5.3	18	
	13	B		
	5			
-15	8	3.6	17	
	14	B		
	3			
	5	1.9	15	
	6	B		
	3			
-20	4	1.7	21	
	7	B		

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material
				CLAY-brown-stiff to hard *(continued)*
	3			
	5	2.0	18	
	7	B		
	3			
-25	5	1.9	21	
	6	B		
	2			
	4	1.9	22	
	6	B		
	3			
-30	4	1.1	23	
	5	B		
	2			
	4	1.2	24	
-35	4	B		
	4			
-40	6	1.9	19	
	9	B		

Z:\PROJECTS\2016\16-17 KNIGHT EA, IDOT PUMP STATION 38 FAP 346 (PTB 178, ITEM 1)\16017 BORING LOGS\16017_LOG.GPJ, 10/15/18

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, from 137 (Rev. 8-99)

Geo Services, Inc.
Geotechnical, Environmental & Civil Engineering
805 Amherst Court, Suite 204
Naperville, Illinois 60565
(630) 355-2828

SOIL BORING LOG

GSI Job No. 16017
Page 2 of 3
Date 9/5/17

ROUTE FAP 346 DESCRIPTION Pump Station LOGGED BY JT
SECTION LOCATION SW 1/4, SEC. 32, TWP. T44N, RNG. R12E, 3rd PM
COUNTY Lake DRILLING METHOD Hollow Stem Auger/Rotary HAMMER TYPE CME Automatic

STRUCT. NO.
Station
BORING NO. PS-01
Station 53+94
Offset 57.70ft Right
Ground Surface Elev. 670.50 ft

Surface Water Elev. n/a ft
Stream Bed Elev. n/a ft
Groundwater Elev.:
First Encounter Dry to -10.0 ft
Upon Completion n/a ft
After 24 Hrs. - ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material
				CLAY-brown-stiff to hard *(continued)*
	6			
-45	8	2.0	23	
	9	B		
	3			
-50	4	1.5	19	
	7	B		
	4			
-55	7	2.2	20	
	9	B		
	2			
-60	10	3.0	22	
	13	P		

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material
				CLAY-brown-stiff to hard *(continued)*
	4			
-65	5	1.0	27	
	6	B		
				603.50
				SILTY CLAY LOAM-gray-soft
	3			
-70	3	0.3	21	
	4	B		
				598.50
				CLAY-gray-medium stiff to stiff
	2			
-75	2	1.2	17	
	4	B		
	2			
-80	3	0.6	22	
	4	B		

Z:\PROJECTS\2016\16-17 KNIGHT EA, IDOT PUMP STATION 38 FAP 346 (PTB 178, ITEM 1)\16017 BORING LOGS\16017_LOG.GPJ, 10/15/18

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, from 137 (Rev. 8-99)

Geo Services, Inc.
Geotechnical, Environmental & Civil Engineering
805 Amherst Court, Suite 204
Naperville, Illinois 60565
(630) 355-2828

SOIL BORING LOG

GSI Job No. 16017
Page 3 of 3
Date 9/5/17

ROUTE FAP 346 DESCRIPTION Pump Station LOGGED BY JT
SECTION LOCATION SW 1/4, SEC. 32, TWP. T44N, RNG. R12E, 3rd PM
COUNTY Lake DRILLING METHOD Hollow Stem Auger/Rotary HAMMER TYPE CME Automatic

STRUCT. NO.
Station
BORING NO. PS-01
Station 53+94
Offset 57.70ft Right
Ground Surface Elev. 670.50 ft

Surface Water Elev. n/a ft
Stream Bed Elev. n/a ft
Groundwater Elev.:
First Encounter Dry to -10.0 ft
Upon Completion n/a ft
After 24 Hrs. - ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material
				CLAY-gray-medium stiff to stiff *(continued)* 589.50
				Drillers Observation: Possible boulder 588.50
				CLAY LOAM-gray-hard
	4			
	18			
-85	23	8.8	11	
	35	B		
	14			
	21	12.2	10	
-90	33	S		
	9			
	12	5.3	12	
-95	22	B		
	12			
-100	12	5.6	14	End Of Boring @ -100.0'. Boring backfilled with cuttings. 570.50
	18	B		

Z:\PROJECTS\2016\16-17 KNIGHT EA, IDOT PUMP STATION 38 FAP 346 (PTB 178, ITEM 1)\16017 BORING LOGS\16017_LOG.GPJ, 10/15/18

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, from 137 (Rev. 8-99)

PLOT DATE = 6/9/2020

KNIGHT
Engineers & Architects

	DESIGNED - GSI	REVISED	
	CHECKED - TB	REVISED	
SCALE - NONE	DRAWN - TB	REVISED	
DATE - 6/9/2020	CHECKED - LAS	REVISED	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SOIL BORING LOG - 1
PUMP STATION 38
SHEET NO. SA-39 OF 40 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	218
		CONTRACT NO. 62B65		
	ILLINOIS	FED. AID PROJECT		

Geo Services, Inc.
Geotechnical, Environmental & Civil Engineering
805 Amherst Court, Suite 204
Naperville, Illinois 60565
(630) 355-2828

GSI Job No. 16017

SOIL BORING LOG

Date 9/13/17

ROUTE FAP 346 **DESCRIPTION** Pump Station **LOGGED BY** JT

SECTION **LOCATION** SW 1/4, **SEC.** 32, **TWP.** T44N, **RNG.** R12E, 3rd **PM**

COUNTY Lake **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** Diedrich Automatic

STRUCT. NO.
Station

BORING NO. PS-02
Station 54+32
Offset 89.00ft Right
Ground Surface Elev. 670.50 ft

Surface Water Elev. n/a ft
Stream Bed Elev. n/a ft

Groundwater Elev.:
First Encounter 652.0 ft ▼
Upon Completion 624.5 ft ▽
After 24 **Hrs.** - ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
12.0" TOPSOIL-black			
669.50			13
CLAY-brown & gray-hard	7		
	8	5.8	21
	9	B	
	6		
	8	4.5	19
-5	10	P	
	7		
	17	4.5	16
	17	P	
	4		
	9	8.1	16
-10	14	B	
660.00			
CLAY LOAM-gray-hard	9		
	11	4.5	13
	9	P	
657.50			
CLAY-gray-stiff to very stiff	4		
	6	2.8	18
-15	8	B	
	4		
	5	2.2	19
	7	B	
▼			
	3		
	4	1.1	19
-20	5	B	

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
CLAY-gray-stiff to very stiff *(continued)*			
	3		
	6	B	
	2		
	5	1.9	18
-25	7	B	
	4		
	5	1.9	21
	6	B	
	2		
	5	2.1	21
-30	6	B	
	2		
	4	1.9	22
-35	5	B	
633.50			
SILTY CLAY-gray-very stiff	2		
	5	2.7	19
-40	8	B	

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, from 137 (Rev. 8-99)

Geo Services, Inc.
Geotechnical, Environmental & Civil Engineering
805 Amherst Court, Suite 204
Naperville, Illinois 60565
(630) 355-2828

GSI Job No. 16017

SOIL BORING LOG

Date 9/13/17

ROUTE FAP 346 **DESCRIPTION** Pump Station **LOGGED BY** JT

SECTION **LOCATION** SW 1/4, **SEC.** 32, **TWP.** T44N, **RNG.** R12E, 3rd **PM**

COUNTY Lake **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** Diedrich Automatic

STRUCT. NO.
Station

BORING NO. PS-02
Station 54+32
Offset 89.00ft Right
Ground Surface Elev. 670.50 ft

Surface Water Elev. n/a ft
Stream Bed Elev. n/a ft

Groundwater Elev.:
First Encounter 652.0 ft ▼
Upon Completion 624.5 ft ▽
After 24 **Hrs.** - ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
SILTY CLAY-gray-very stiff *(continued)*			
	5		
	8	2.3	19
-45	11	B	
▽			
623.50			
CLAY-gray-very stiff	4		
	5	2.1	19
End Of Boring @ -50.0'. Boring backfilled with cuttings.	6	B	
620.50 -50			
-55			
-60			

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, from 137 (Rev. 8-99)

Z:\PROJECTS\2016\16617 KNIGHT EA, IDOT PUMP STATION 38 FAP 346 (PTB 178, ITEM 1)\16017 BORING LOGS\16017_LOG.GPJ 10/15/18

PLOT DATE = 6/9/2020

KNIGHT
Engineers & Architects

	DESIGNED - GSI	REVISED	
	CHECKED - TB	REVISED	
SCALE - NONE	DRAWN - TB	REVISED	
DATE - 6/9/2020	CHECKED - LAS	REVISED	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SOIL BORING LOG – 2
PUMP STATION 38
SHEET NO. SA-40 OF 40 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	219
		CONTRACT NO. 62B65		
	ILLINOIS FED. AID PROJECT			

GENERAL MECHANICAL SYMBOLS

PIPE FITTINGS

DESCRIPTION	SYMBOL
CROSS	
CROSS (BRANCH UP)	
TEE	
TEE (BRANCH UP)	
TEE (BRANCH DOWN)	
SIDE OUTLET TEE (UP)	
SIDE OUTLET TEE (DOWN)	
LATERAL OR WYE	
90° BEND	
90° BEND (UP)	
90° BEND (DOWN)	
90° BEND (LONG RADIUS)	LR
45° BEND	
45° BEND (UP)	
45° BEND (DOWN)	
45° BEND (LONG RADIUS)	LR
SIDE OUTLET ELBOW (UP)	
SIDE OUTLET ELBOW (DOWN)	
BLIND FLANGE (TEE BRANCH UP)	
BASE ELBOW	
BLIND FLANGE	
REDUCER	
REDUCER – ECCENTRIC	
SLEEVE TYPE COUPLING	
FILLING RING	

PIPE FITTINGS

DESCRIPTION	SYMBOL
VENT	
WATER LEVEL ALARM (HWL OR LWL)	
PIPE CAP (SCREWED)	
DIRECTION OF FLOW	
GAS METER	Ⓜ

PIPE JOINTS

DESCRIPTION	SYMBOL
FLANGE	
MECHANICAL (R = RESTRAINED)	R
PUSH–ON (R = RESTRAINED)	R
WELDED	
SCREWED	
CONCRETE	
GROOVED	

OTHER SYMBOLS

DESCRIPTION	SYMBOL
WATER SURFACE	

VALVE SYMBOLS

DESCRIPTION	SYMBOL
KNIFE GATE VALVE	K
GAS COCK	
GAS PRESURE REGULATOR (PRV)	P

WALL FITTINGS

DESCRIPTION	SYMBOL
WALL SLEEVE (CAULKED OR GROUTED)	
WALL SLEEVE WITH MECHANICAL LINK SEAL	
FLEXIBLE RESILIENT COMPRESSION CONNECTION	
FLANGE AND FLANGE FLUSH WALL PIPE WITH INTERMEDIATE COLLAR (FL x FL)	
FLANGE AND PLAIN END FLUSH WALL PIPE WITH INTERMEDIATE COLLAR (FL x PE)	

GENERAL MECHANICAL ABBREVIATIONS

ACFM	ACTUAL CUBIC FEET PER MINUTE
AFF	ABOVE FINISHED FLOOR
APPROX.	APPROXIMATE
ARCH.	ARCHITECTURAL
BCR	BRIDGE CRANE
BOD	BOTTOM OF DUCT
CFM	CUBIC FEET PER MINUTE
C.I.	CAST IRON
℄	CENTERLINE
CMU	CONCRETE MASONRY UNIT
C.O.	CLEANOUT
CONC.	CONCRETE
CONN.	CONNECTION
CONT.	CONTINUATION
CORP.	CORPORATION
CPVC	CHLORINATED POLYVINYL CHLORIDE
CS	CARBON STEEL
DEG. F.	DEGREES FAHRENHEIT
DET.	DETAIL
D.I.	DUCTILE IRON
DIA.	DIAMETER
DN	DOWN
DWG'S.	DRAWINGS
ECC. RED.	ECCENTRIC REDUCER
EFF.	EFFLUENT
EFF. %	% EFFICIENCY
EGL	ENERGY GRADE LINE
ELEC.	ELECTRICAL
EL.	ELEVATION
ENCL.	ENCLOSURE
EW	EFFLUENT WATER
EXIST.	EXISTING
FE	FLOWMETER
FIN. FL.	FINISHED FLOOR
FIN. GR.	FINISHED GRADE
FIT	FLOW INDICATING TRANSMITTER
FLEX.	FLEXIBLE
FL.	FLANGE
F.O.B.	FLAT ON BOTTOM
F.O.S.	FLAT ON SIDE
F.O.T.	FLAT ON TOP
FPM	FEET PER MINUTE
FS	FLOW SWITCH
FT.	FEET
GAL.	GALLONS
GALV.	GALVANIZED
GPM	GALLONS PER MINUTE
HGL	HYDRAULIC GRADE LINE
H.P.	HIGH POINT
HP	HORSE POWER
HPT	HOSE PIPE THREAD
HST	HOIST
HVAC	HEATING VENTILATION
I.D.	INSIDE DIAMETER
IN.	INCHES
INSUL.	INSULATION
INV.	INVERT
KGV	KNIFE GATE VALVE
KW	KILOWATTS
LB.	POUND
LE	LEVEL CONTROLLER
LG.	LONG
L.P.	LOW POINT
L.R. ELL.	LONG RADIUS ELBOW
L.R. RED.– BASE ELL.	LONG RADIUS REDUCING BASE ELBOW
L.R. RED.– ELL.	LONG RADIUS REDUCING ELBOW
LSH	LEVEL SWITCH HIGH
LSHH	LEVEL SWITCH HIGH HIGH
LSL	LEVEL SWITCH LOW
LSP	LIQUID SAMPLE PORT
LT	LEVEL TRANSMITTER
LxW	LENGTH X WIDTH
MAX.	MAXIMUM
MATL.	MATERIAL
MECH.	MECHANICAL
MGD	MILLION GALLONS PER DAY
MH	MANHOLE
MIN.	MINIMUM
N.C.	NORMALLY CLOSED
N.O.	NORMALLY OPEN
No.	NUMBER
NOM.	NOMINAL
NPT	NATIONAL PIPE THREAD
NTS	NOT TO SCALE
O.C.	ON CENTER
O.D.	OUTSIDE DIAMETER
OPER.	OPERATING
P	PRESSURE GAUGE
PL	PLATE
PLUMB.	PLUMBING
PRV	PRESSURE REGULATOR VALVE
PSI	POUNDS PER SQUARE INCH
PSIA	POUNDS PER SQUARE INCH ABSOLUTE
PSIG	POUNDS PER SQUARE INCH GAGE
PVC	POLYVINYL CHLORIDE
R	RADIUS
RCP	REINFORCED CONCRETE PIPE
RED.	REDUCER
RED. FLG.	REDUCING FLANGE
REF.	REFERENCE
REINF.	REINFORCING
REQ'D.	REQUIRED
RPM	REVOLUTIONS PER MINUTE
SCH.	SCHEDULE
SCR	SCREEN
SG	SLIDE GATE
SH.	SHEET
SL	STOP LOG
SPD	SUMP PUMP DISCHARGE
SPECS.	SPECIFICATIONS
SQ.	SQUARE
SR	RAW SEWAGE
S.S.	STAINLESS STEEL
STD.	STANDARD
STR.	STRUCTURAL
SW	SEAL WATER
TEMP.	TEMPERATURE
THK.	THICK
T.O.C.	TOP OF CONCRETE
T.O.D.	TOP OF DUCT
TYP.	TYPICAL
V	VENT
VAC	VACUUM
W/	WITH
WxH	WIDTH X HEIGHT
WC	WATER COLUMN
WMS	WIRE MESH SCREEN
WS	WATER SURFACE
XPROOF	EXPLOSION PROOF

NOTES:

1. THIS IS A GENERAL LEGEND PROVIDED TO FACILITATE USE OF THE PLANS. REFER TO THE PLANS AND SPECIFICATIONS FOR ITEMS REQUIRED.
2. VALVES AND PIPE FITTINGS ARE SHOWN WITH FLANGED JOINTS. OTHER JOINTS ARE SHOWN AS REQUIRED ON MECHANICAL DRAWINGS.
3. ALL SYMBOLS AND ABBREVIATIONS SHOWN ON THIS SHEET MAY NOT APPEAR ON THIS SET OF DRAWINGS.

GENERAL MECHANICAL NOTES:

1. REFER TO ARCHITECTURAL AND STRUCTURAL DRAWINGS FOR HATCH AND GRATING DETAILS.
2. CONTRACTOR TO PROVIDE A LAYOUT DRAWING SHOWING ALL PIPING, SUPPORTS, AND APPURTENANCES.
3. ALL DIMENSIONS LOCATING EQUIPMENT ARE FROM FINISHED WALL SURFACES OR CENTERLINES, AS INDICATED.
4. SEE CIVIL DRAWINGS FOR CONTINUATION OF PIPING OUTSIDE STRUCTURES.
5. ALL PIPE PENETRATIONS THROUGH INTERIOR AND EXTERIOR WALLS AND FLOORS SHALL BE SEALED WATERTIGHT.
6. SLEEVE COUPLINGS MAY BE USED WHERE NECESSARY, AND AS APPROVED BY THE ENGINEER, TO FACILITATE PIPING INSTALLATION.
7. FOR FLANGED SYSTEMS PROVIDE FLEXIBLE CONNECTORS WHERE NECESSARY, AND AS APPROVED BY THE ENGINEER, TO FACILITATE PIPING INSTALLATION AND VALVE AND EQUIPMENT REMOVAL.
8. ALL FLEXIBLE CONNECTORS, EXPANSION JOINTS, AND SLEEVE COUPLINGS SUBJECT TO PRESSURE SHALL BE RESTRAINED AS REQUIRED FOR EXPANSION AND FOR FLEXIBILITY.
9. THE CONTRACTOR SHALL MAKE ALL REQUIRED FIELD MEASUREMENTS TO VERIFY EXISTING AND CONTRACT INTERFACE DIMENSIONS, LOCATIONS, AND OTHER CONDITIONS.
10. THE PLANS ARE GENERALLY DIAGRAMMIC IN NATURE. ROUTING OF PIPING, DUCTWORK, CONDUITS, ETC., AS SHOWN ON THE DRAWINGS, DOES NOT INTEND TO SHOW EVERY RISE, DROP, OFFSET, FITTING, OR STRUCTURAL ELEMENT THAT MAY BE REQUIRED. THE CONTRACTOR SHALL VERIFY EXACT PLACEMENT OF ALL DEVICES AND EQUIPMENT WITH FIELD CONDITIONS AND APPROVED SHOP DRAWINGS.
11. THE DRAWINGS, SCHEDULES, AND SPECIFICATIONS HAVE BEEN PREPARED USING SPECIFIC MANUFACTURERS FOR THE BASIS OF DIMENSIONAL DESIGN. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CHECKING ALL OF THE EQUIPMENT DIMENSIONS TO ENSURE THAT ALL COMPONENTS WILL FIT INTO THE DESIGNATED SPACES INDICATED ON THE DRAWINGS. MINOR DEVIATIONS IN DIMENSIONS WILL BE PERMITTED AT THE ENGINEER'S DISCRETION, PROVIDED THAT THE EQUIPMENT MEETS THE SPECIFIED RATINGS AND FITS INTO THE ALLOCATED SPACES WITH SUITABLE CLEARANCE FOR ACCESS. THE CONTRACTOR SHALL PROVIDE ALL ALTERATIONS REQUIRED TO ACCOMMODATE SUCH EQUIPMENT AT NO ADDITIONAL COST TO THE OWNER.
12. PIPE SUPPORTS FOR PIPES LESS THAN 8–INCHES IN DIAMETER ARE NOT SHOWN ON THESE PLANS FOR CLARITY. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY PIPE SUPPORT SYSTEMS WITH SUITABLE SPACING AS REQUIRED BY THE PROJECT SPECIAL PROVISIONS.
13. ALL MECHANICAL AND ELECTRICAL ITEMS INSTALLED IN THE PUMP STATION WET WELL AND DRY WELL AREAS SHALL BE SUITABLE FOR CLASS 1, DIVISION II, GROUP D, EXPLOSION PROOF; AS CLASSIFIED BY THE NATIONAL ELECTRIC CODE (NEC) FOR HAZARDOUS LOCATIONS.
14. GAS PIPES MUST BE SLOPED AT 1/4 INCH IN EVERY 15 FEET (IFGC 408.1).
15. GAS PIPING MATERIAL MUST CONFORM TO THE GAS PIPING AND TUBING MATERIAL MATRIX (IFGC 403 REQUIREMENTS).
16. GAS PIPING MATERIAL MUST BE SIZED IN ACCORDANCE TO IFGC TABLES 402.(1) THROUGH 402.3(34) (IFGC 402.3).
17. VENTING OF ALL GAS FIRED APPLIANCES MUST CONFORM TO INTERNATIONAL FUEL GAS CODE 2015 (IFGC).
18. ALL EQUIPMENTS IN THE DRY AND WET WELL AREAS SHALL BE SUITABLE FOR CLASS 1, GROUP D, DIVISION 2 HAZARDOUS LOCATIONS.
19. REFER TO PUMP MANUFACTURER'S INSTRUCTIONS FOR THE MOUNTING OF PUMPS TO THE CONCRETE BASE.

M1

9/10/2019 7:35:09 AM
G:\LM161003 IDOT US 41 at Dearpath PS 38\00Model Files\100 PCT Submittal\7355 Pump Station– M1–DEG.dgn

DELTA ENGINEERING GROUP, LLC

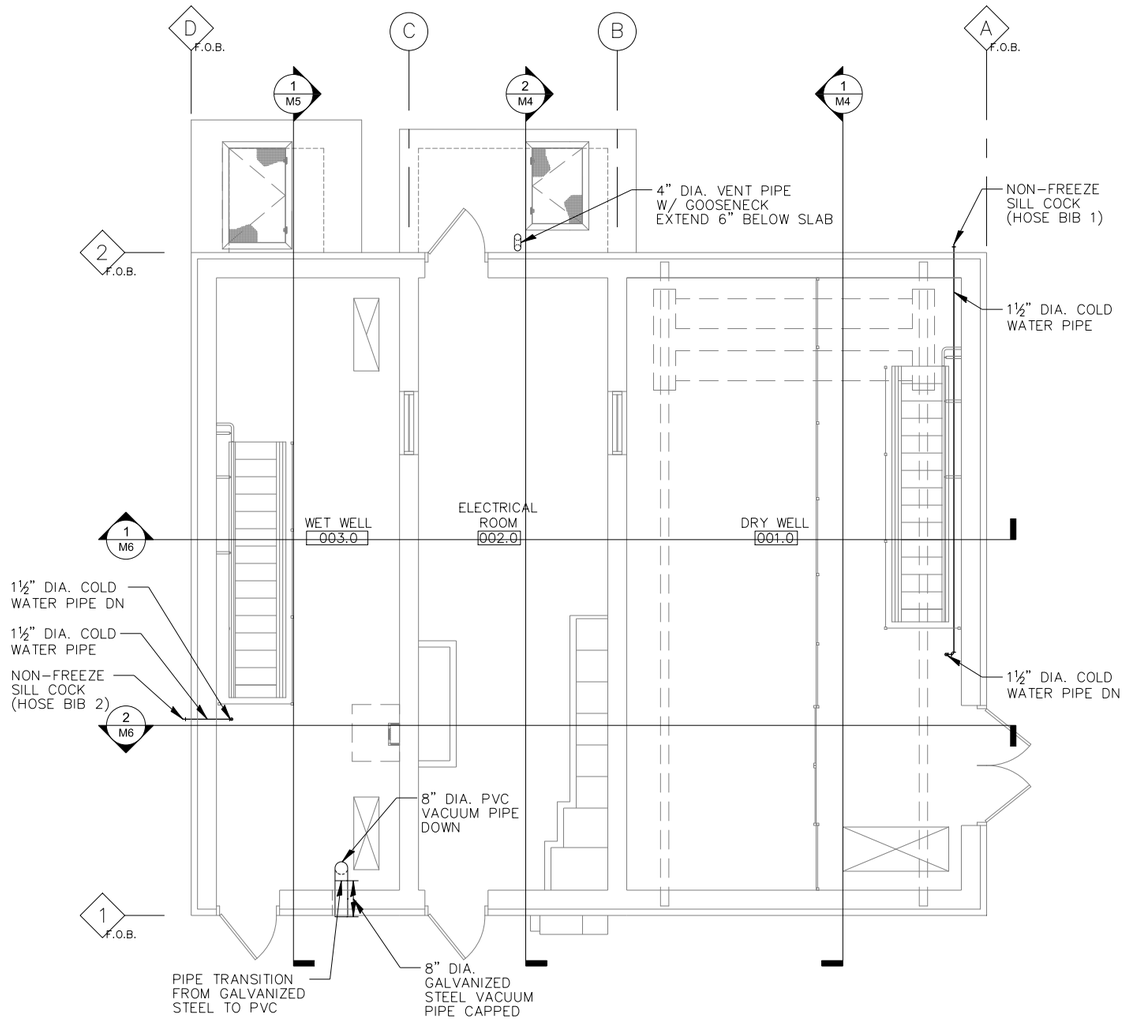
USER NAME = $USER$	DESIGNED MD	REVISED –	
	DRAWN AA	REVISED –	
PLOT SCALE = $SCALE$	CHECKED JB	REVISED –	
PLOT DATE = 9/10/2019	DATE 07/16/2019	REVISED –	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

MECHANICAL ABBREVIATIONS, SYMBOLS AND NOTES
PUMP STATION 38

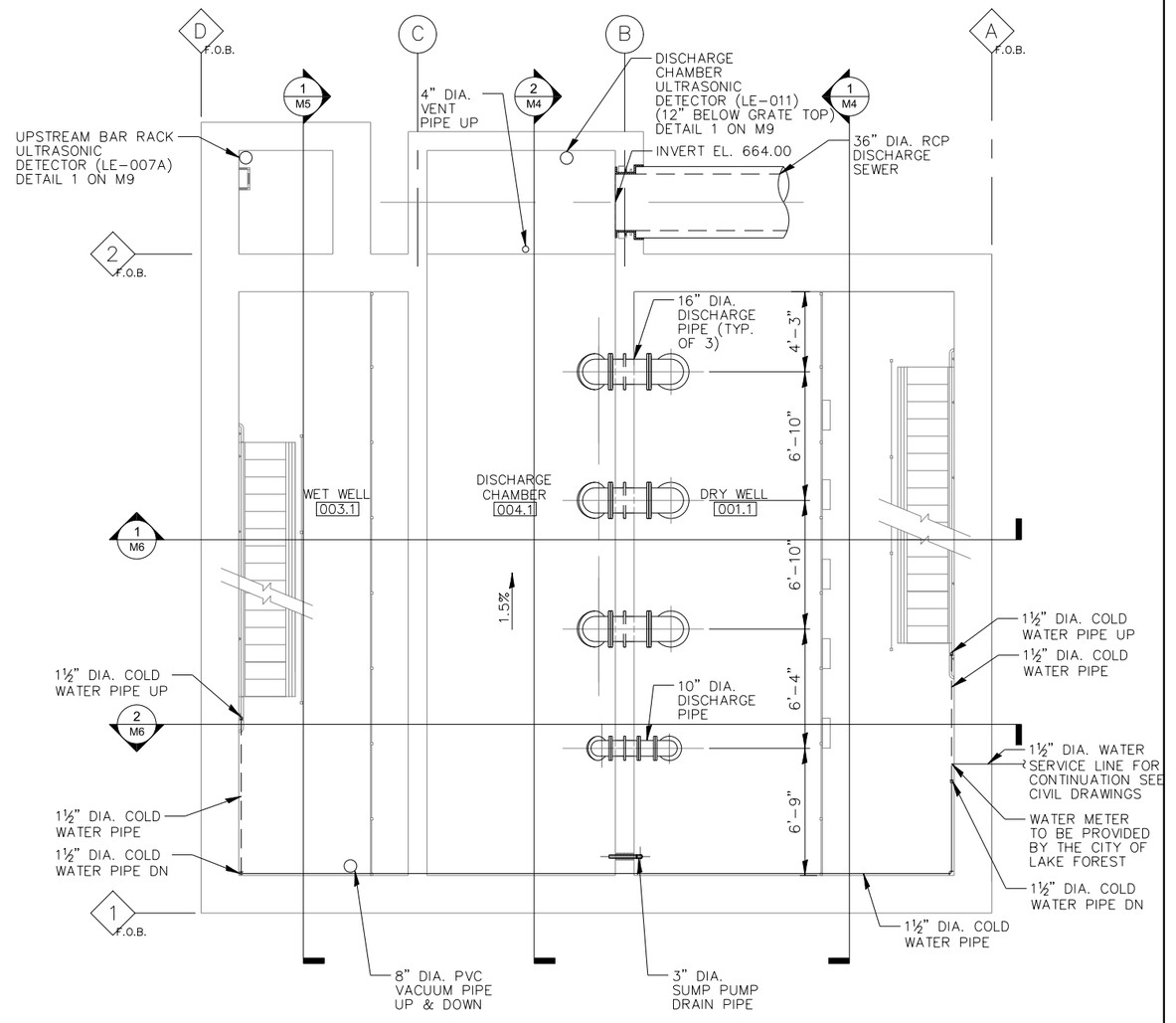
SCALE: AS SHOWN | SHEET NO. 1 OF 10 SHEETS

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
P346 U1245	(21&21S)–I	LAKE	289	220
		CONTRACT NO. 62B65		
	ILLINOIS FED. AID PROJECT			



1 MECH GROUND FLOOR PLAN – EL: 671.50

SCALE: ¼" = 1'-0"



2 MECH INTERMEDIATE FLOOR PLAN (–1) – EL: 661.58 – DISCHARGE EL: 664.00 LP

SCALE: ¼" = 1'-0"

N

0 4' 8' 12' 16'

SCALE IN FEET

M2

9/10/2019 7:36:45 AM
G:\LM161003 IDOT US 41 at Dearpath PS 38\00Model Files\100 PCT Submittal\7355 Pump Station- M2-DEG.dgn

DELTA ENGINEERING GROUP, LLC

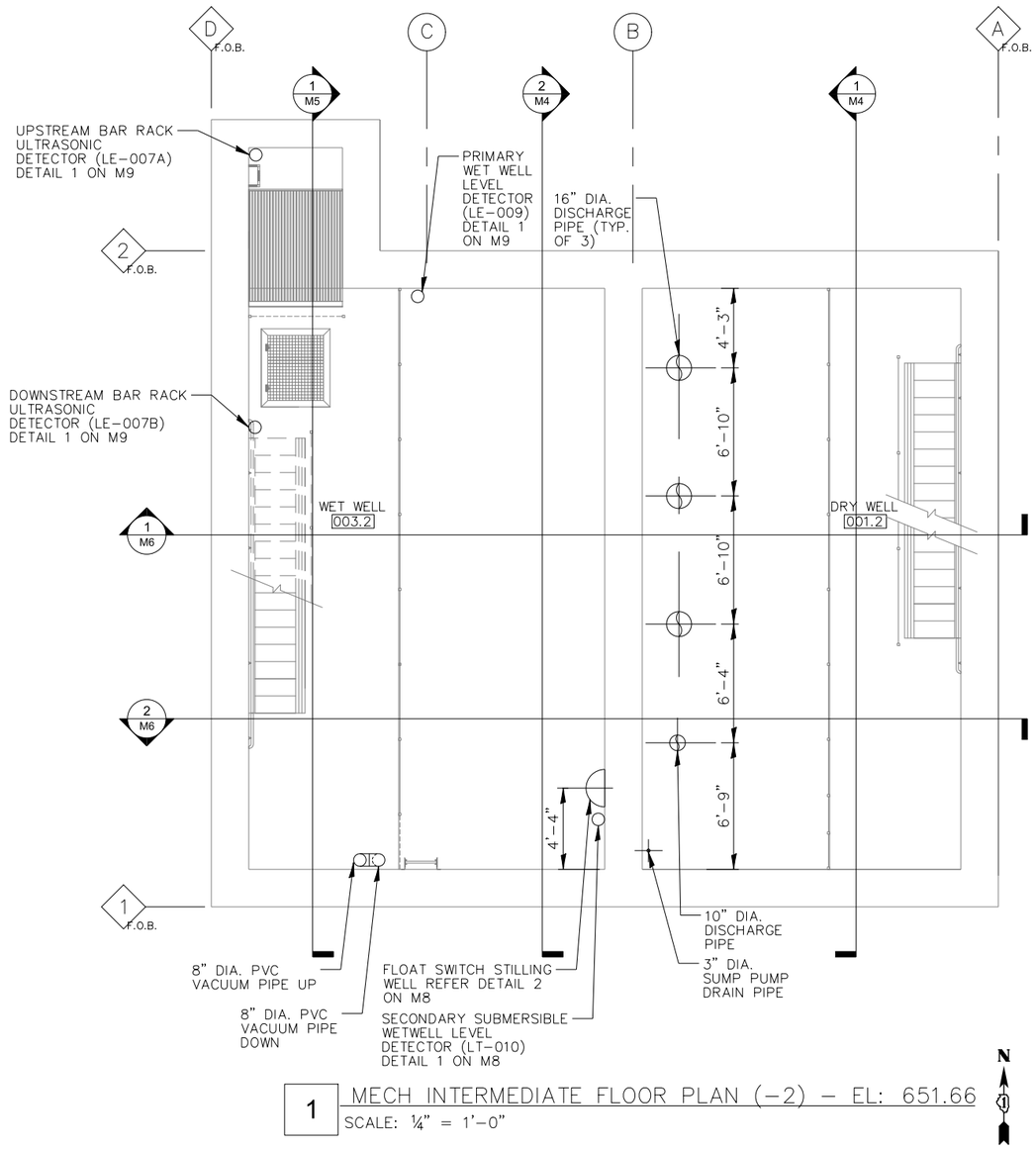
USER NAME = $USER$	DESIGNED MD	REVISED –	
	DRAWN AA	REVISED –	
PLOT SCALE = $SCALE$	CHECKED JB	REVISED –	
PLOT DATE = 9/10/2019	DATE 07/16/2019	REVISED –	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

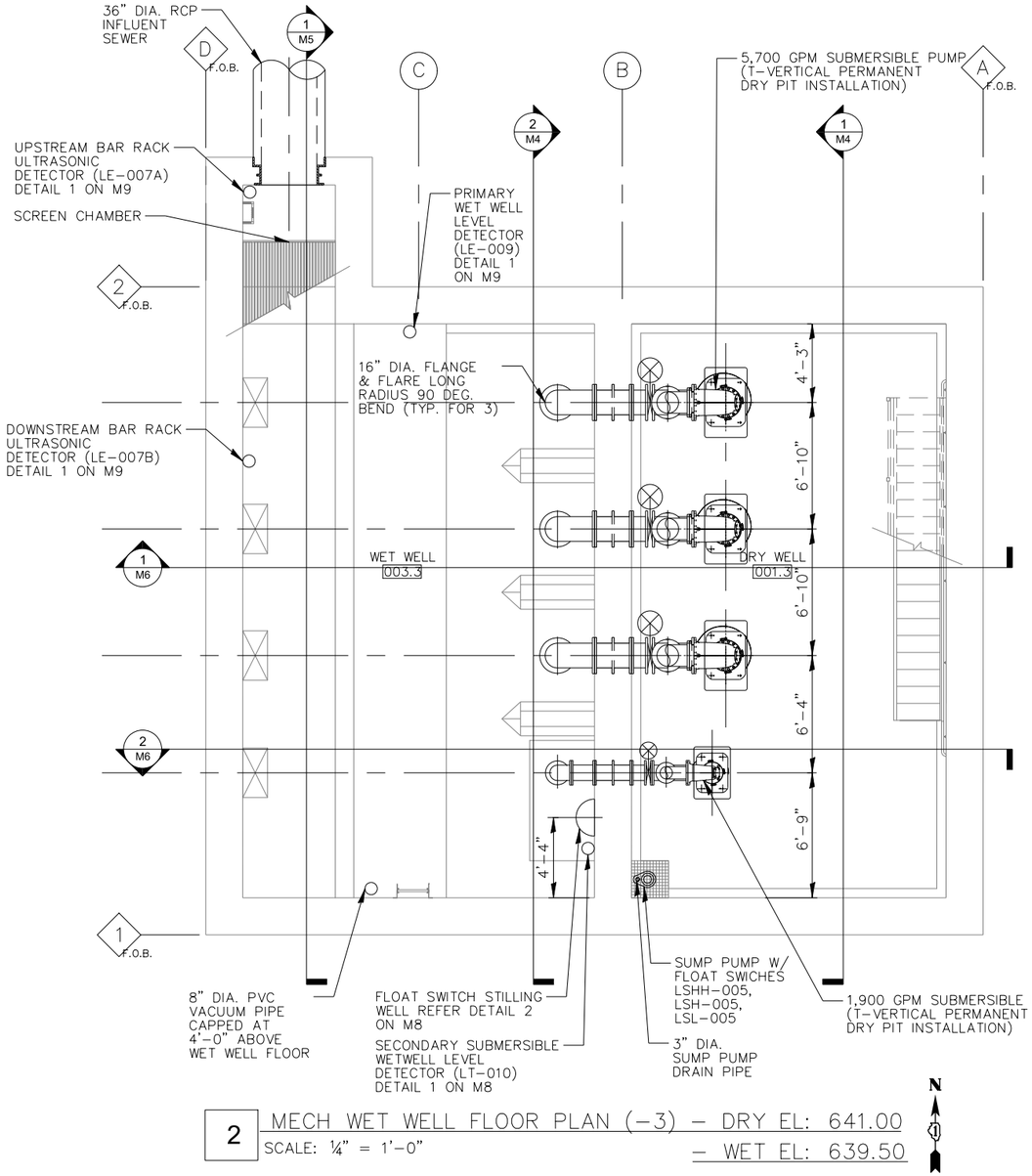
MECH GROUND & INTERMEDIATE FLOOR PLANS
PUMP STATION 38

SCALE: AS SHOWN | SHEET NO. 2 OF 10 SHEETS

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
P346 U1245	(21&21S)-I	LAKE	289	221
		CONTRACT NO. 62B65		
	ILLINOIS FED. AID PROJECT			



1 MECH INTERMEDIATE FLOOR PLAN (-2) – EL: 651.66
SCALE: ¼" = 1'-0"



2 MECH WET WELL FLOOR PLAN (-3) – DRY EL: 641.00 – WET EL: 639.50
SCALE: ¼" = 1'-0"

0 4' 8' 12' 16'

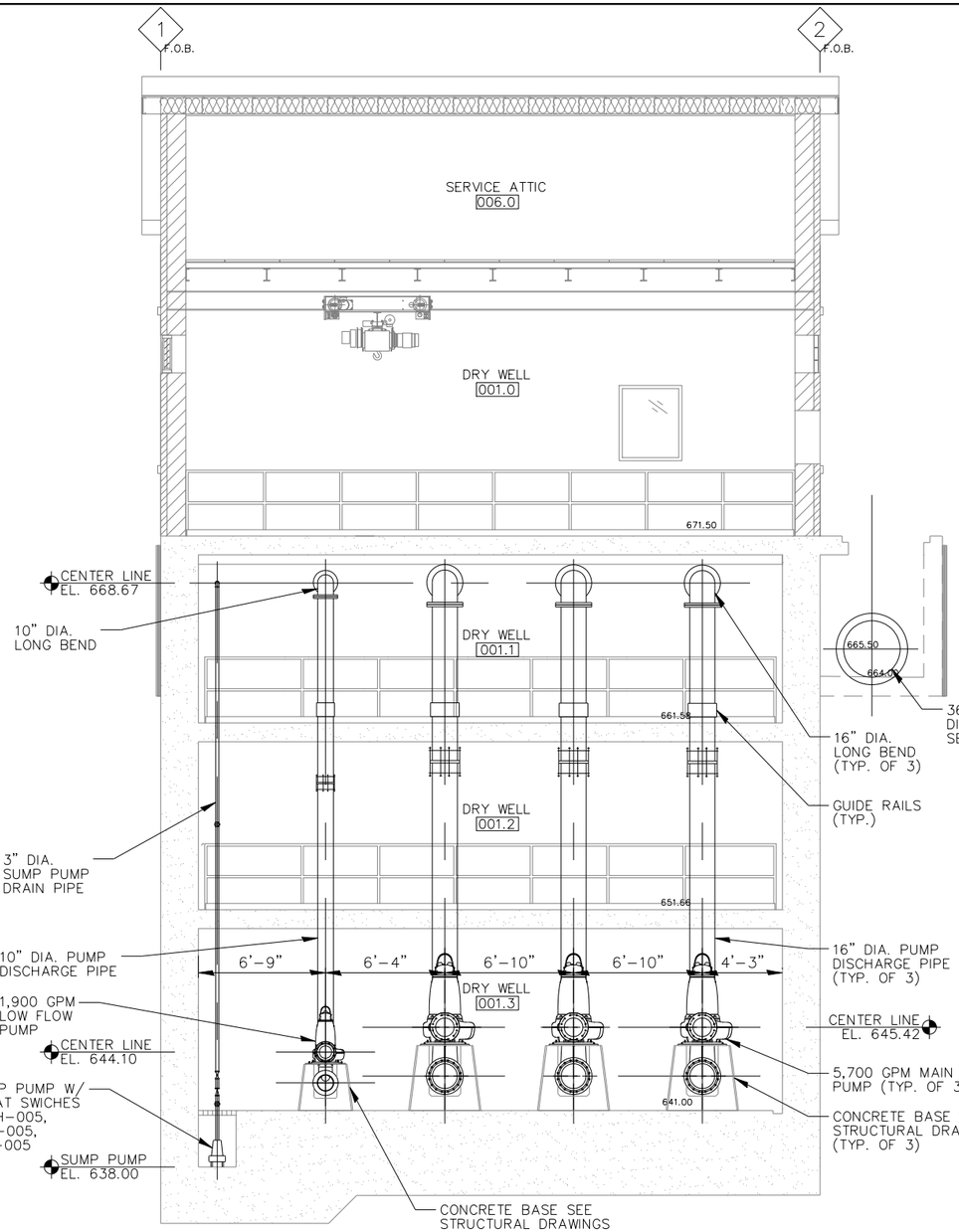
SCALE IN FEET

M3

DELTA ENGINEERING GROUP, LLC	USER NAME = $USER$	DESIGNED MD	REVISED –	**STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION**	**MECH INTERMEDIATE & WET WELL FLOOR PLANS PUMP STATION 38**
		DRAWN AA	REVISED –		
	PLOT SCALE = $SCALE$	CHECKED JB	REVISED –		SCALE: AS SHOWN SHEET NO. 3 OF 10 SHEETS
	PLOT DATE = 9/10/2019	DATE 07/16/2019	REVISED –		

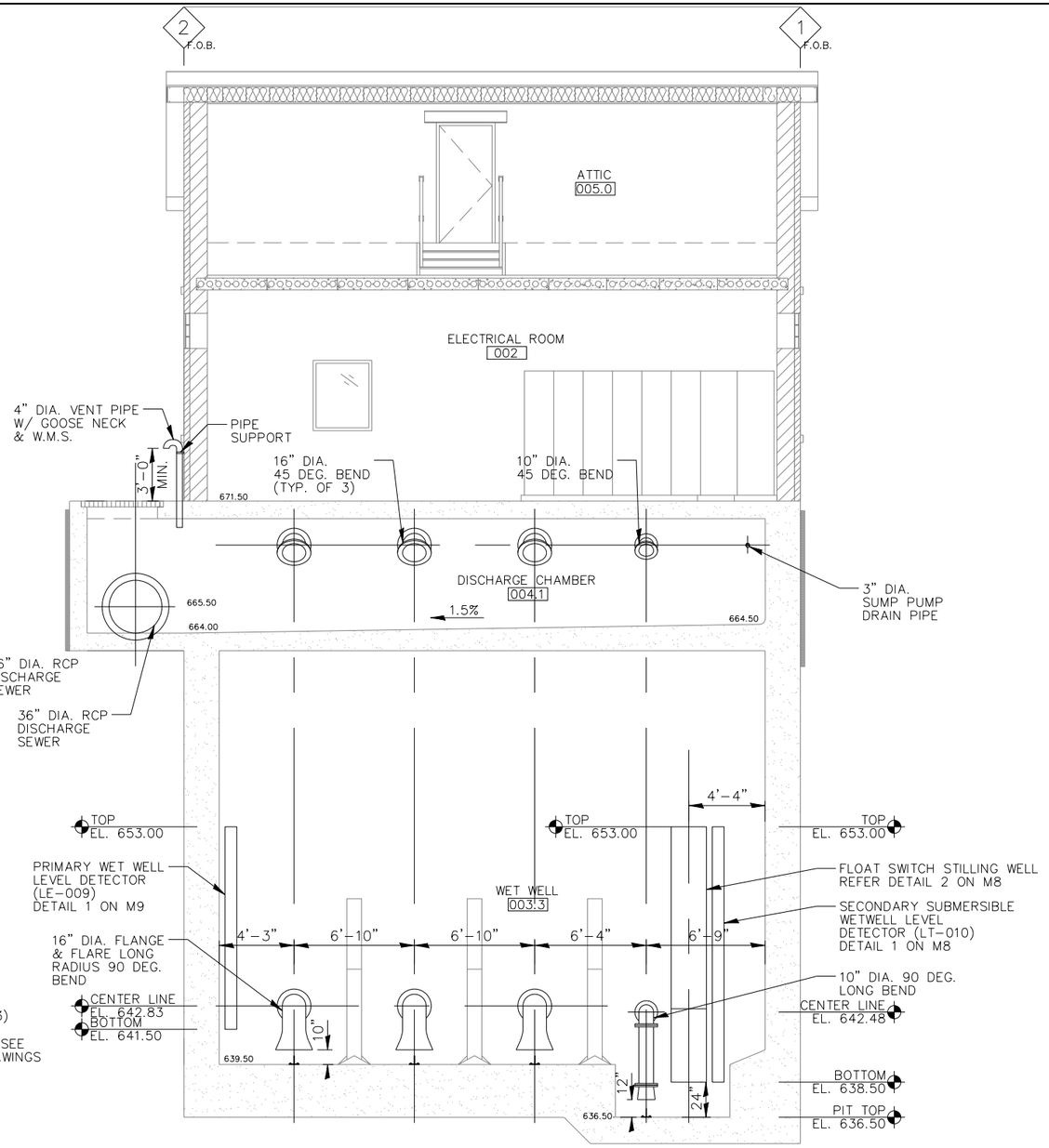
F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
P346 U1245	(21&21S)-I	LAKE	289	222
		CONTRACT NO. 62B65		
	ILLINOIS FED. AID PROJECT			

9/10/2019 7:37:08 AM
G:\LM161003 IDOT US 41 at Dearpath PS 38\00Model Files\100 PCT Submittal\7355 Pump Station- M3-DEG.dgn



1 MECH BUILDING SECTION

SCALE: ¼" = 1'-0"



2 MECH BUILDING SECTION

SCALE: ¼" = 1'-0"

0 4' 8' 12' 16'

SCALE IN FEET

M4

9/10/2019 7:37:35 AM
G:\LM16\003 IDOT US 41 at Dearpath PS 38\00Model Files\100 PCT Submittal\7355 Pump Station- M4-DEG.dgn

DELTA ENGINEERING GROUP, LLC

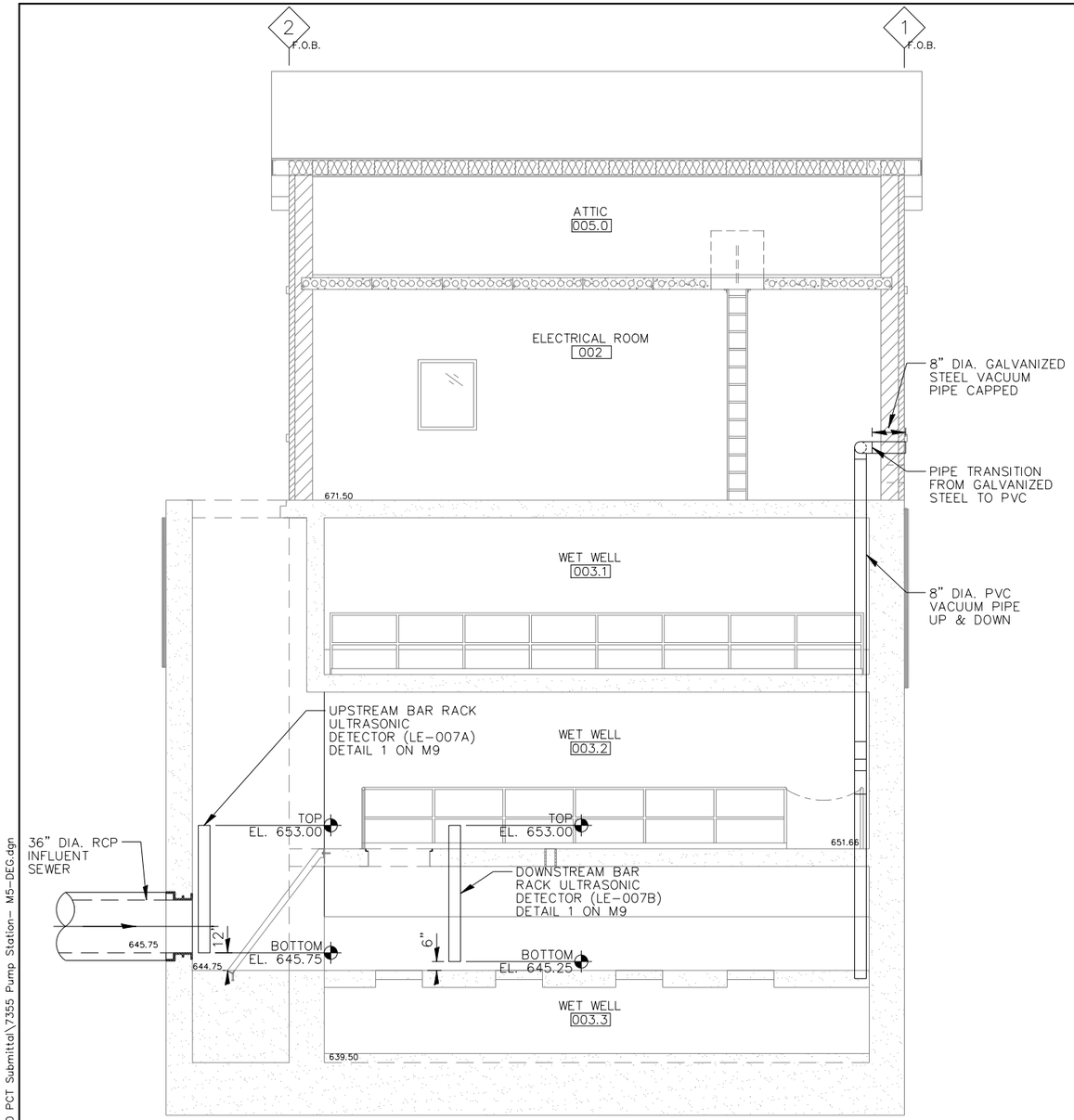
USER NAME = $USER$	DESIGNED MD	REVISED —	
	DRAWN AA	REVISED —	
PLOT SCALE = $SCALE$	CHECKED JB	REVISED —	
PLOT DATE = 9/10/2019	DATE 07/16/2019	REVISED —	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

MECH BUILDING SECTIONS
PUMP STATION 38

SCALE: AS SHOWN | SHEET NO. 4 OF 10 SHEETS

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
P346 U1245	(21&21S)-I	LAKE	289	223
		CONTRACT NO. 62B65		
	ILLINOIS FED. AID PROJECT			



1 MECH BUILDING SECTION

SCALE: ¼" = 1'-0"

0 4' 8' 12' 16'

SCALE IN FEET

M5

9/10/2019 7:38:11 AM
G:\LM\61003 IDOT US 41 at Dearpath PS 38\00Model Files\100 PCT Submittal\7355 Pump Station- M5-DEG.dgn

DELTA ENGINEERING GROUP, LLC

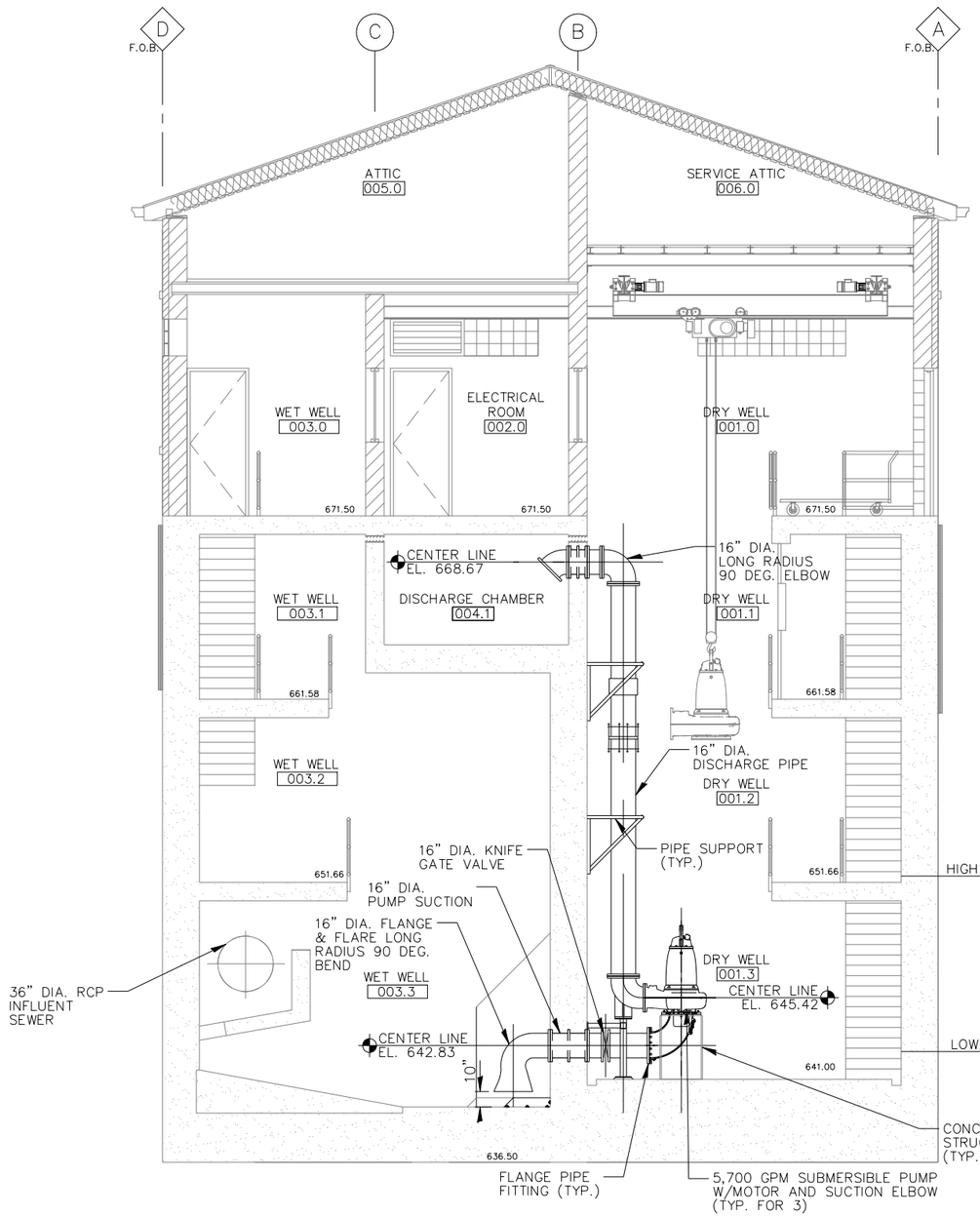
USER NAME = $USER$	DESIGNED MD	REVISED —	
	DRAWN AA	REVISED —	
PLOT SCALE = $SCALE$	CHECKED JB	REVISED —	
PLOT DATE = 9/10/2019	DATE 07/16/2019	REVISED —	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

MECH BUILDING SECTIONS
PUMP STATION 38

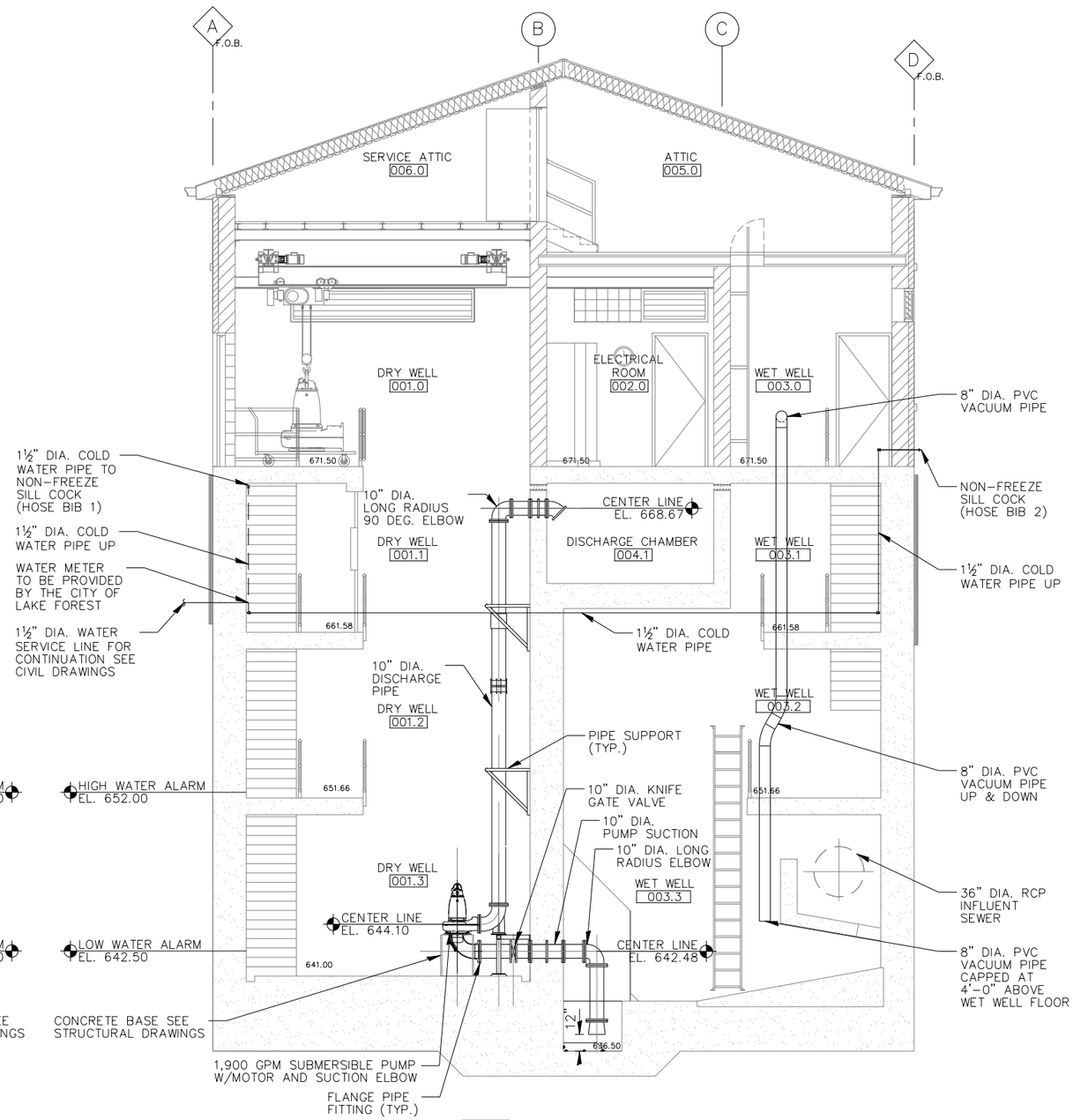
SCALE: AS SHOWN | SHEET NO. 5 OF 10 SHEETS

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.346 U1245	(21&21S)-I	LAKE	289	224
		CONTRACT NO. 62B65		
	ILLINOIS FED. AID PROJECT			



1 MECH BUILDING SECTION

SCALE: ¼" = 1'-0"



2 MECH BUILDING SECTION

SCALE: ¼" = 1'-0"

NOTE:

1. ALL SUCTION AND DISCHARGE PIPING FROM PUMPS SHALL BE DUCTILE IRON PIPE WITH FLANGED JOINTS.
2. ALL FLANGES SHALL BE DUCTILE IRON.
3. FOR ADDITIONAL INFORMATION REGARDING HIGH AND LOW WATER ALARM ELEVATIONS REFER TO SHEET IC18.

0 4' 8' 12' 16'

SCALE IN FEET

M6

9/10/2019 7:38:44 AM
G:\LM161003 IDOT US 41 at Dearpath PS 38\00Model Files\100 PCT Submittal\7355 Pump Station- M6-DEG.dgn

DELTA ENGINEERING GROUP, LLC

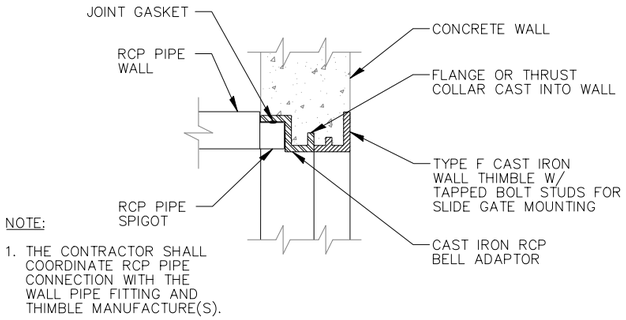
USER NAME = $USER$	DESIGNED MD	REVISED —	
	DRAWN AA	REVISED —	
PLOT SCALE = $SCALE$	CHECKED JB	REVISED —	
PLOT DATE = 9/10/2019	DATE 07/16/2019	REVISED —	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

MECH BUILDING SECTIONS
PUMP STATION 38

SCALE: AS SHOWN | SHEET NO. 6 OF 10 SHEETS

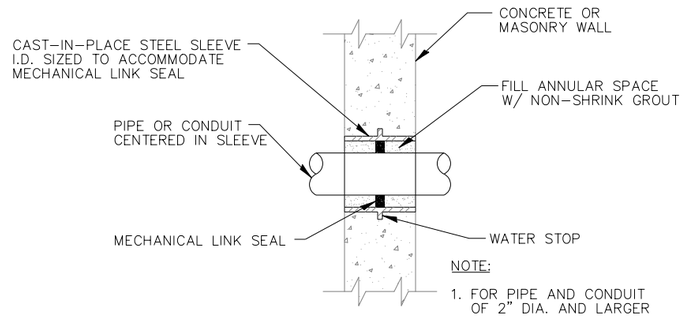
F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
P346 U1245	(21&21S)-I	LAKE	289	225
		CONTRACT NO. 62B65		
	ILLINOIS FED. AID PROJECT			



NOTE:

1. THE CONTRACTOR SHALL COORDINATE RCP PIPE CONNECTION WITH THE WALL PIPE FITTING AND THIMBLE MANUFACTURE(S).

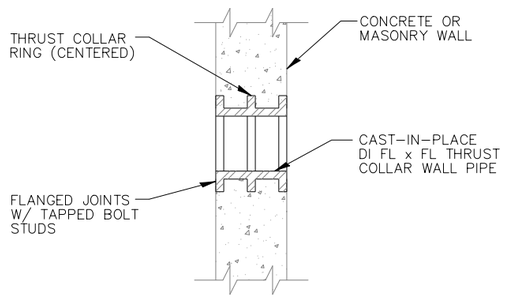
1 WALL CASTING CONNECTION
SCALE: NONE



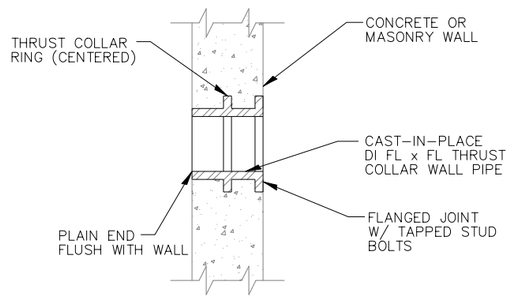
NOTE:

1. FOR PIPE AND CONDUIT OF 2" DIA. AND LARGER

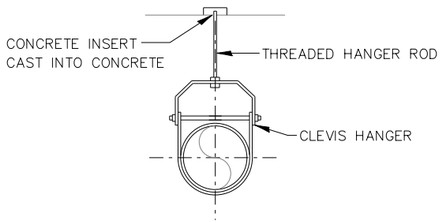
2 PIPE AND CONDUIT SEALED PENETRATION
SCALE: NONE



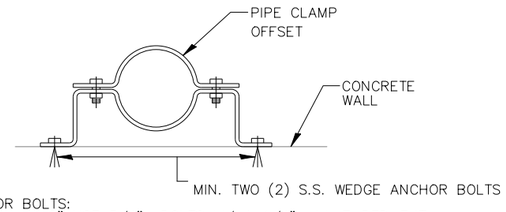
3 WALL PIPE CASTING (FL x FL)
SCALE: NONE



4 WALL PIPE CASTING (PE x FL)
SCALE: NONE

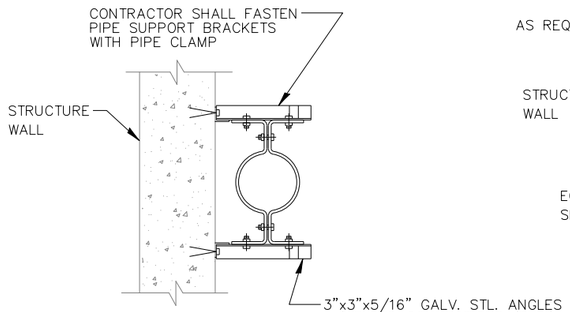


5 PIPE HANGERS
SCALE: NONE

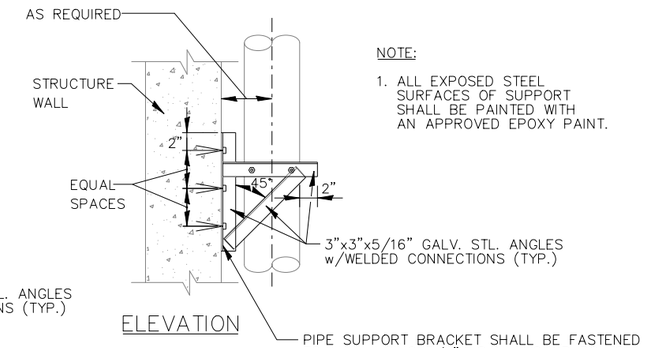


ANCHOR BOLTS:
PIPE DIA. ≥ 8" USE 3/4"ø BOLTS W/ 4-1/4" MIN. EMBEDMENT
PIPE DIA. < 8" USE 1/2"ø BOLTS W/ 3-1/2" MIN. EMBEDMENT

6 PIPE SUPPORT-1
SCALE: NONE



PLAN

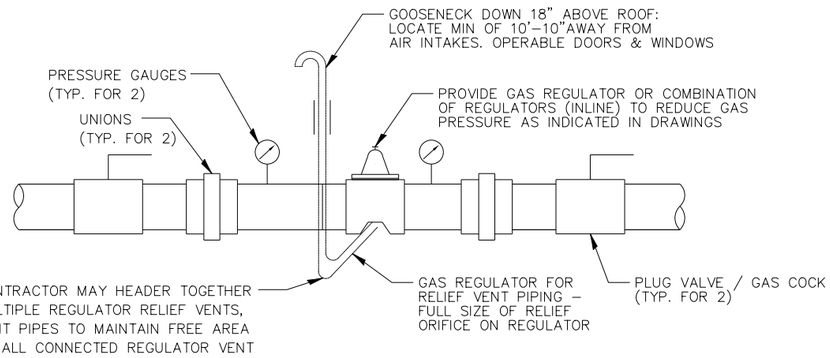


NOTE:

1. ALL EXPOSED STEEL SURFACES OF SUPPORT SHALL BE PAINTED WITH AN APPROVED EPOXY PAINT.

ELEVATION

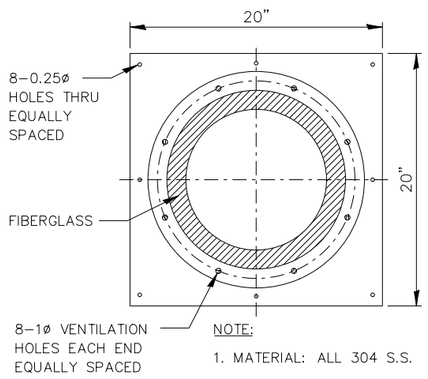
7 PIPE SUPPORT-2
SCALE: NONE



NOTE:

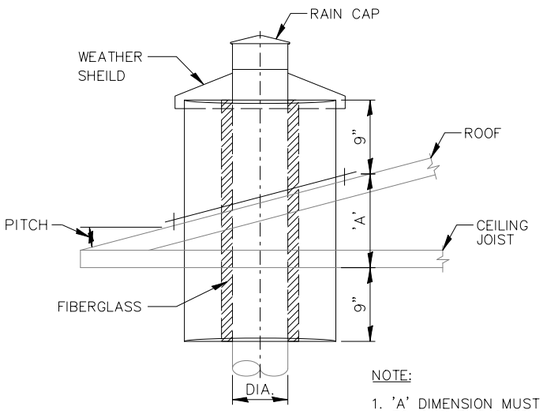
1. GAS METER AND PRESSURE REGULATOR BY NORTH SHORE GAS CO.

8 NATURAL GAS PRESSURE REDUCING STATION
SCALE: NONE



NOTE:

1. MATERIAL: ALL 304 S.S.
2. THIMBLE INCLUDES LOOSE PLATES.



NOTE:

1. 'A' DIMENSION MUST BE ADDED TO FIND THE OVERALL LENGTH. 9" OF EXTENSION IS REQUIRED, TO MEET CODE. ADD 'A' + 18" FOR OVERALL LENGTH NEEDED.

9 THIMBLE DETAIL
SCALE: NONE

M7

9/10/2019 7:39:21 AM
G:\LM161003 IDOT US 41 at Dearpath PS 38\00Model Files\100 PCT Submittal\7355 Pump Station- M7-DEG.dgn

DELTA ENGINEERING GROUP, LLC

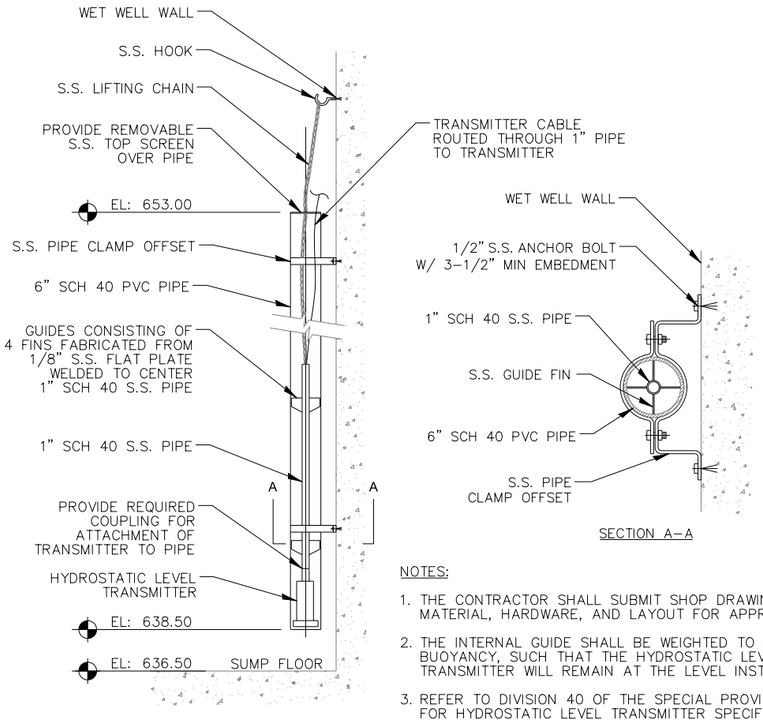
USER NAME = $USER$	DESIGNED MD	REVISED —	
	DRAWN AA	REVISED —	
PLOT SCALE = $SCALE$	CHECKED JB	REVISED —	
PLOT DATE = 9/10/2019	DATE 07/16/2019	REVISED —	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

MECHANICAL DETAILS
PUMP STATION 38

SCALE: AS SHOWN | SHEET NO. 7 OF 10 SHEETS

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
P346 U1245	(21&21S)-I	LAKE	289	226
		CONTRACT NO. 62B65		
		ILLINOIS FED. AID PROJECT		

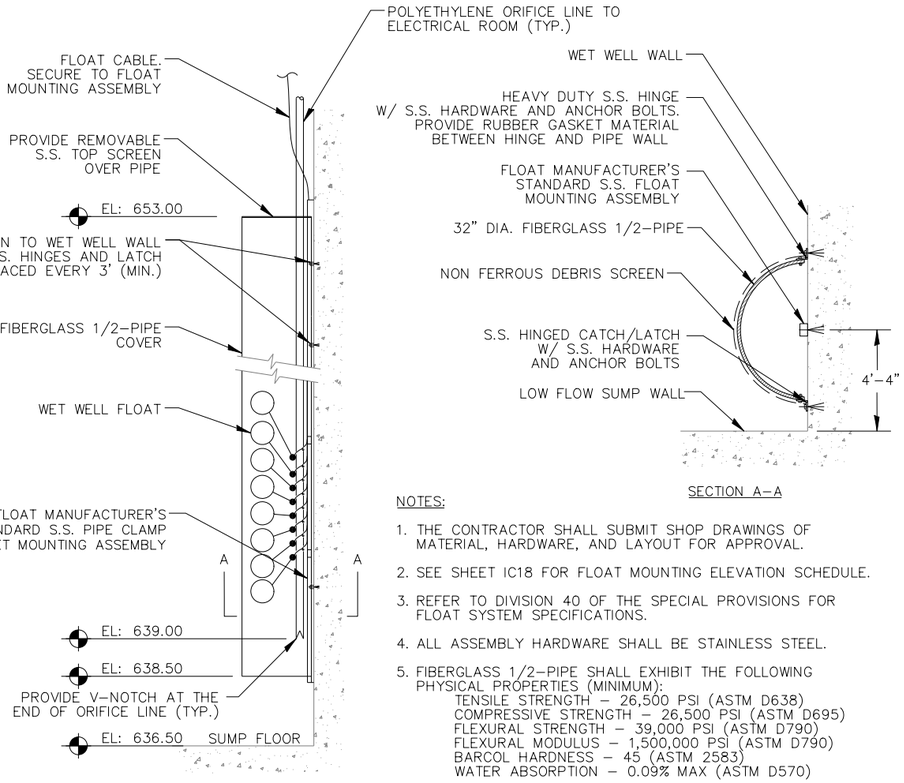


NOTES:

1. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS OF MATERIAL, HARDWARE, AND LAYOUT FOR APPROVAL.
2. THE INTERNAL GUIDE SHALL BE WEIGHTED TO AVOID BUOYANCY, SUCH THAT THE HYDROSTATIC LEVEL TRANSMITTER WILL REMAIN AT THE LEVEL INSTALLED.
3. REFER TO DIVISION 40 OF THE SPECIAL PROVISIONS FOR HYDROSTATIC LEVEL TRANSMITTER SPECIFICATION.

1 SUBMERSIBLE LEVEL TRANSMITTER INSTALLATION

SCALE: NONE



NOTES:

1. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS OF MATERIAL, HARDWARE, AND LAYOUT FOR APPROVAL.
2. SEE SHEET IC18 FOR FLOAT MOUNTING ELEVATION SCHEDULE.
3. REFER TO DIVISION 40 OF THE SPECIAL PROVISIONS FOR FLOAT SYSTEM SPECIFICATIONS.
4. ALL ASSEMBLY HARDWARE SHALL BE STAINLESS STEEL.
5. FIBERGLASS 1/2-PIPE SHALL EXHIBIT THE FOLLOWING PHYSICAL PROPERTIES (MINIMUM):
   TENSILE STRENGTH - 26,500 PSI (ASTM D638)
   COMPRESSIVE STRENGTH - 26,500 PSI (ASTM D695)
   FLEXURAL STRENGTH - 39,000 PSI (ASTM D790)
   FLEXURAL MODULUS - 1,500,000 PSI (ASTM D790)
   BARCOL HARDNESS - 45 (ASTM 2583)
   WATER ABSORPTION - 0.09% MAX (ASTM D570)

2 STILLING WELL INSTALLATION

SCALE: NONE

M8

9/10/2019 7:39:49 AM
G:\LM161003 IDOT US 41 at Dearpath PS 38\00Model Files\100 PCT Submittal\7355 Pump Station- M8-DEG.dgn

DELTA ENGINEERING GROUP, LLC

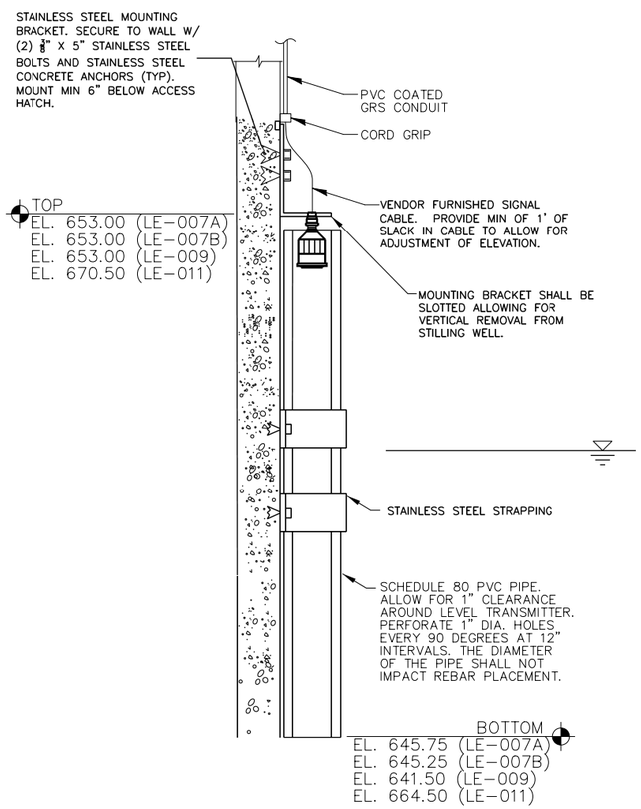
USER NAME = $USER$	DESIGNED MD	REVISED -	
	DRAWN AA	REVISED -	
PLOT SCALE = $SCALE$	CHECKED JB	REVISED -	
PLOT DATE = 9/10/2019	DATE 07/16/2019	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

MECHANICAL DETAILS
PUMP STATION 38

SCALE: AS SHOWN | SHEET NO. 8 OF 10 SHEETS

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
7346 U1245	(21&21S)-I	LAKE	289	227
		CONTRACT NO. 62B65		
	ILLINOIS	FED. AID PROJECT		



1 ULTRASONIC DETECTOR (LE-007A),(LE-007B), (LE-009) & (LE-011)
SCALE: NONE

M9

DELTA ENGINEERING GROUP, LLC

USER NAME = $USER$	DESIGNED MD	REVISED —	
	DRAWN AA	REVISED —	
PLOT SCALE = $SCALE$	CHECKED JB	REVISED —	
PLOT DATE = 9/10/2019	DATE 07/16/2019	REVISED —	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

MECHANICAL DETAILS
PUMP STATION 38

SCALE: AS SHOWN | SHEET NO. 9 OF 10 SHEETS

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
P346 U1245	(21&21S)-I	LAKE	289	228
		CONTRACT NO. 62B65		
	ILLINOIS FED. AID PROJECT			

PUMP SCHEDULE													
TAG	LOCATION	SERVICE	FLUID	TYPE	GPM	HEAD FEET	MOTOR				MANUFACTURER	MODEL NO.	REMARKS
							BHP	HP	RPM	VOLT/PH/HZ			
MFP-1 (MAIN FLOW PUMP)	DRY WELL	PUMP STATION	WATER	VERTICAL	5,700	29.50	58.0	70	1,185	460/3/60	FLYGHT	NT3301LT3-628	1, 2, 3
MFP-2 (MAIN FLOW PUMP)	DRY WELL	PUMP STATION	WATER	VERTICAL	5,700	29.50	58.0	70	1,185	460/3/60	FLYGHT	NT3301LT3-628	1, 2, 3
MFP-3 (MAIN FLOW PUMP)	DRY WELL	PUMP STATION	WATER	VERTICAL	5,700	29.50	58.0	70	1,185	460/3/60	FLYGHT	NT3301LT3-628	1, 2, 3
LFP-1 (LOW FLOW PUMP)	DRY WELL	PUMP STATION	WATER	VERTICAL	1,900	26.00	17.1	20	1,760	460/3/60	FLYGHT	NT3153LT3-413	1, 2, 3
SP-1 (SUMP PUMP)	DRY WELL	PUMP STATION	WATER	VERTICAL	20	30.00	0.4	1/2	3,480	460/3/60	HYDRO MATIC	SK-50	1, 2, 3

NOTES:

1. ALL EQUIPMENTS SHALL BE SUITABLE FOR CLASS 1, GROUP D, DIVISION 2, EXPLOSION PROOF CONSTRUCTION FOR HAZARDOUS LOCATIONS.
2. COORDINATE WITH ELECTRICAL AND SCADA PLANS.
3. REFER TO SHEET IC18 FOR DATA OF PUMP OPERATIONS WITH RISING / FALLING WATER LEVELS.

DELTA ENGINEERING GROUP, LLC

USER NAME = $USER$	DESIGNED MD	REVISED —	
	DRAWN AA	REVISED —	
PLOT SCALE = $SCALE$	CHECKED JB	REVISED —	
PLOT DATE = 9/10/2019	DATE 07/16/2019	REVISED —	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

MECHANICAL SCHEDULES
PUMP STATION 38

SCALE: AS SHOWN | SHEET NO. 10 OF 10 SHEETS

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
P346 U1245	(21&21S)-I	LAKE	289	229
		CONTRACT NO. 62B65		
	ILLINOIS FED. AID PROJECT			

GENERAL HV SYMBOLS

HV FITTINGS

SYMBOL	DESCRIPTION
	FLEXIBLE EQUIPMENT AND DUCT CONNECTION
	SUPPLY AIR DUCT UP
	EXHAUST AIR DUCT UP
	SUPPLY AIR DUCT DOWN
	EXHAUST AIR DUCT DOWN
	DIRECTION OF AIRFLOW
M	MOTORIZED DAMPER
T	THERMOSTAT
	CONTINUATION
X X	EQUIPMENT TAG EQUIPMENT NUMBER

GENERAL HV ABBREVIATIONS

AD	ACCESS DOOR
AFF	ABOVE FINISHED FLOOR
AL	ALUMINUM
AMP	AMPERE
AP	ACCESS PANEL
AVG	AVERAGE
BHP	BRAKE HORSEPOWER
BLDG	BUILDING
BOD	BOTTOM OF DUCT
BTUH	BRITISH THERMAL UNITS PER HOUR
CAV	CONSTANT AIR VOLUME
CD	CEILING DIFFUSER
CFM	CUBIC FEET PER MINUTE
CL	CENTER LINE
CONC	CONCRETE
DB	DRY BULB TEMPERATURE °F
DIFF	DIFFUSER
DG	DOOR GRILLE
DN	DOWN
DRN	DRAIN
DTL	DETAIL
DWG	DRAWING
DX	DIRECT EXPANSION
EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE °F
EC	ELECTRICAL CONTRACTOR
EF	EXHAUST FAN
EFF	EFFICIENCY
EL	ELEVATION
ESP	EXTERNAL STATIC PRESSURE
EUH	ELECTRIC UNIT HEATER
EWT	ENTERING WATER TEMPERATURE °F
EXH	EXHAUST
F	FILTER
°F	TEMPERATURE IN DEGREES FAHRENHEIT
FA	FREE AREA
FLEX	FLEXIBLE
FPM	FEET PER MINUTE
FT	FOOT / FEET
FT2	SQUARE FEET
FT3	CUBIC FEET
G	GAUGE
GC	GENERAL CONTRACTOR
H	HORIZONTAL
HTG	HEATING
HP	HORSEPOWER
HZ	HERTZ
ID	INSIDE DIAMETER
IN	INCH
INSUL	INSULATION
KW	KILOWATT
LAT	LEAVING AIR TEMPERATURE °F
LB	POUND
M	MOTOR
MAX	MAXIMUM
MBH	ONE THOUSAND BTU'S PER HOUR
MC	MECHANICAL CONTRACTOR
MECH	MECHANICAL
MIN	MINIMUM
MD	MOTORIZED DAMPER
MTG	MOUNTING
N	NORTH
N.C.	NORMALLY CLOSED
NK	NECK
NO	NORMALLY OPEN
NTS	NOT TO SCALE
OA	OUTSIDE AIR
OAI	OUTSIDE AIR INTAKE
OD	OUTSIDE DIAMETER
OV	OUTLET VELOCITY
P	PUMP
PH	PHASE
PRESS	PRESSURE
REG	REGISTER
RH	RELATIVE HUMIDITY
RM	ROOM
RO	RELIEF OPENING
RPM	REVOLUTION PER MINUTE
S	SWITCH
SA	SUPPLY AIR
SC	SPEED CONTROL
SCH	SCHEDULE
SF	SUPPLY FAN
SP	STATIC PRESSURE
SS	STAINLESS STEEL
STL	STEEL
SUP	SUPPLY
T	THERMOSTAT
ΔT	TEMPERATURE DIFFERENCE
TA	TRANSFER AIR
TD	TEMPERATURE DROP
TE	TOILET EXHAUST
TEMP	TEMPERATURE
THRU	THROUGH
TS	TIP SPEED
TSP	TOTAL STATIC PRESSURE
TYP	TYPICAL
V	VOLTAGE
VD	VOLUME DAMPER
VEL	VELOCITY
VIB ISOL	VIBRATION ISOLATOR
VIF	VERIFY IN FIELD
VOL	VOLUME
W	WATT
W/	WITH
WC	WATER COLUMN
WMS	WIRE MESH SCREEN
WP	WORKING PRESSURE

NOTES:

1. THIS IS A GENERAL LEGEND PROVIDED TO FACILITATE USE OF THE PLANS. REFER TO THE PLANS AND SPECIFICATIONS FOR ITEMS REQUIRED.
2. DUCTS AND FITTINGS ARE SHOWN WITH FLANGED JOINTS. OTHER JOINTS ARE SHOWN AS REQUIRED ON MECHANICAL DRAWINGS.
3. ALL SYMBOLS AND ABBREVIATIONS SHOWN ON THIS SHEET MAY NOT APPEAR ON THIS SET OF DRAWINGS.

GENERAL MECHANICAL NOTES:

1. ALL WORK SHALL BE IN ACCORDANCE WITH SPECIFICATIONS.
2. DRAWINGS ARE GENERALLY DIAGRAMMATIC, ROUTING OF PIPING AND DUCTWORK ARE SHOWN. BUT DO NOT INTEND TO SHOW EVERY RISE, DROP, OFFSET, FITTING NOR EVERY STRUCTURAL ELEMENT THAT MAY BE ENCOUNTERED DURING THE INSTALLATION OF THIS WORK. MAKE ANY REQUIRED CHANGES FROM THE GENERAL ROUTING SHOWN ON THESE DRAWINGS, SUCH AS OFFSETS, BENDS OR CHANGES IN ELEVATION DUE TO COORDINATION WITH THE WORK OF OTHER TRADES AND BUILDING CONSTRUCTION. ALL CHANGES SHALL BE MADE WITHOUT ADDITIONAL COST TO THE OWNER OR DELAY IN COMPLETION OF THE PROJECT.
3. IT IS INTENDED THAT EQUIPMENT SHALL BE LOCATED SYMMETRICALLY WITH THE ARCHITECTURAL ELEMENTS OF THE BUILDING. NOT WITH STANDING THE FACT THAT LOCATIONS INDICATED BY THESE DRAWINGS MAY BE DISTORTED FOR CLEARNESS OF PRESENTATION.
4. PROVIDE SLEEVES IN FLOOR AND WALLS AS SHOWN ON THE DRAWINGS OR REQUIRED BY JOB SITE CONDITIONS OR SPECIFIED, WHEN INSTALLING THEIR WORK.
5. PROVIDE ALL AUXILIARY SUPPORTING STEEL AS REQUIRED FOR THE SUPPORTING OF HIS PIPING, DUCTWORK, CONDUIT, EQUIPMENT, ETC. AS APPROVED BY THE ARCHITECT. ALL SUPPORTING STEEL FOR ITEMS SHALL BE FROM BUILDING STRUCTURAL MEMBERS ONLY.
6. ALL DUCTWORK SIZES SHOW ON THE DRAWINGS ARE INSIDE DIMENSIONS, WHERE DUCT LINING IS CALLED FOR. INCREASE THE SIZE OF THE DUCT TO MAINTAIN THE MINIMUM INSIDE DIMENSIONS CALLED FOR ON THE DRAWINGS.
7. ALL DUCTWORK CONNECTIONS TO AIR MOVING EQUIPMENT SHALL BE MADE WITH FLEXIBLE DUCT CONNECTIONS ON THE INLET AND DISCHARGE OF ALL SUPPLY/RETURN AND EXHAUST FANS (EXCEPT ROOF MOUNTED EXHAUST FANS).
8. ALL SUSPENDED SUPPLY AND EXHAUST FANS SHALL BE HUNG WITH OR SET ON SPRING VIBRATION ISOLATORS.
9. INSTALL TURNING VALVES IN ALL SQUARE DUCT ELBOWS. INSTALL MANUAL VOLUME DAMPERS (VD) IN EACH BRANCH DUCT AT CONNECTION TO MAIN DUCT IN EACH DUCT AFTER A BRANCH DUCT SPLIT.
10. ALL MOTORIZED DAMPERS AND DAMPER MOTORS SHALL BE PROVIDED BY CONTRACTOR.
11. INSTALL A SHEET METAL SLEEVE AROUND ANY DUCTWORK WHICH GOES THRU WALL CONSTRUCTION. PACK FIBERGLASS INSULATION AROUND SLEEVE AND DUCT AND CAULK WITH FIRE SEAL CAULKING.
12. CONTRACTOR SHALL PROVIDE BALANCING DAMPERS AT ALL DUCTWORK TAKEOFFS FOR SUPPLY, RETURN, AND EXHAUST DUCTWORK.
13. ALL THERMOSTATS SHALL BE INSTALLED AT FIVE (5) FEET ABOVE FINISHED FLOOR.
14. ALL DUCT SIZES INDICATED ON PLANS AND RISER ARE CLEAR INSIDE DIMENSIONS. DUCT SIZES NOT SHOWN SHALL BE SIZED TO VELOCITIES NO GREATER THAN UPSTREAM SECTION USING SIMILAR ASPECT RATIOS.
15. PROVIDE MANUAL VOLUME DAMPERS IN ALL BRANCH DUCT WORK TO AIR DIFFUSERS, REGISTERS AND GRILLES.
16. ALL SUPPLY AIR TAKEOFFS FROM MAIN TRUNK DUCTS ARE TO BE PROVIDED WITH BELL MOUTH FITTINGS OR 45 DEGREE ENTRY TO PROVIDE THE SMOOTHEST AIR FLOW POSSIBLE.
17. PROVIDE TURNING VANES IN ALL LOW-PRESSURE 90 DEGREE DUCT TURNS.
18. ALL AIR MOVING EQUIPMENT SHALL BE PROVIDED WITH VIBRATION ISOLATORS AND ISOLATED WITH FLEXIBLE DUCT CONNECTIONS.
19. FOR EXACT LOCATION OF WALL, FLOOR AND ROOF OPENING SEE STRUCTURAL DRAWINGS.
20. ALL EQUIPMENT, PIPING, DUCTWORK TO BE HUNG FROM STRUCTURAL STEEL MEMBERS OR SUPPLEMENTARY STEEL MEMBERS. NO LOADS SHALL BE PERMITTED TO HANG FROM ANY DECK.
21. ALL WORK PERFORMED SHALL CONFORM TO ALL APPLICABLE CITY OF LAKE FOREST CODES.
22. ALL DUCT WORK SHALL BE FABRICATED FROM GALVANIZED SHEET METAL.
23. ALL FLEXIBLE LOW-PRESSURE DUCT WORK SHALL BE PROVIDED AND NOT EXCEED 5'-0" IN LENGTH. MFG. WIREMOLD TYPE WK UL-181, CLASS 1.
24. ALL FLUES SHALL TERMINATE 3'-0" ABOVE THE ROOF LINE.
25. DUCTWORK IN THE DRY AND WET WELL AREAS SHALL BE GROUNDED IN DESIGNATED CLASS 1, GROUP D, DIVISION 2 HAZARDOUS LOCATIONS.
26. ALL EQUIPMENTS IN THE DRY AND WET WELL AREAS SHALL BE SUITABLE FOR CLASS 1, GROUP D, DIVISION 2 HAZARDOUS LOCATIONS.

HV1

9/10/2019 7:44:20 AM
G:\LM161003 IDOT US 41 at Dearpath PS 38\00Model Files\100 PCT Submittal\7355 Pump Station- HV1-DEG.dgn

DELTA ENGINEERING GROUP, LLC

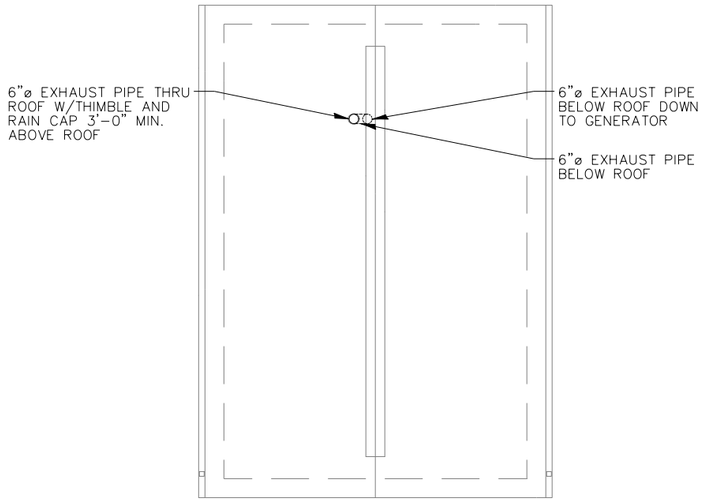
USER NAME = $USER$	DESIGNED MD	REVISED —
	DRAWN AA	REVISED —
PLOT SCALE = $SCALE$	CHECKED JB	REVISED —
PLOT DATE = 9/10/2019	DATE 07/16/2019	REVISED —

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

HV ABBREVIATIONS, SYMBOLS AND NOTES
PUMP STATION 38

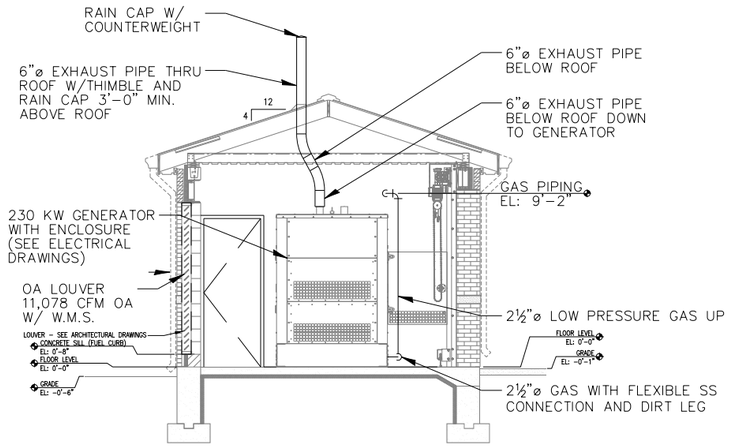
SCALE: AS SHOWN | SHEET NO. 1 OF 8 SHEETS

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
P346 U1245	(21&21S)-I	LAKE	289	230
		CONTRACT NO. 62B65		
	ILLINOIS FED. AID PROJECT			



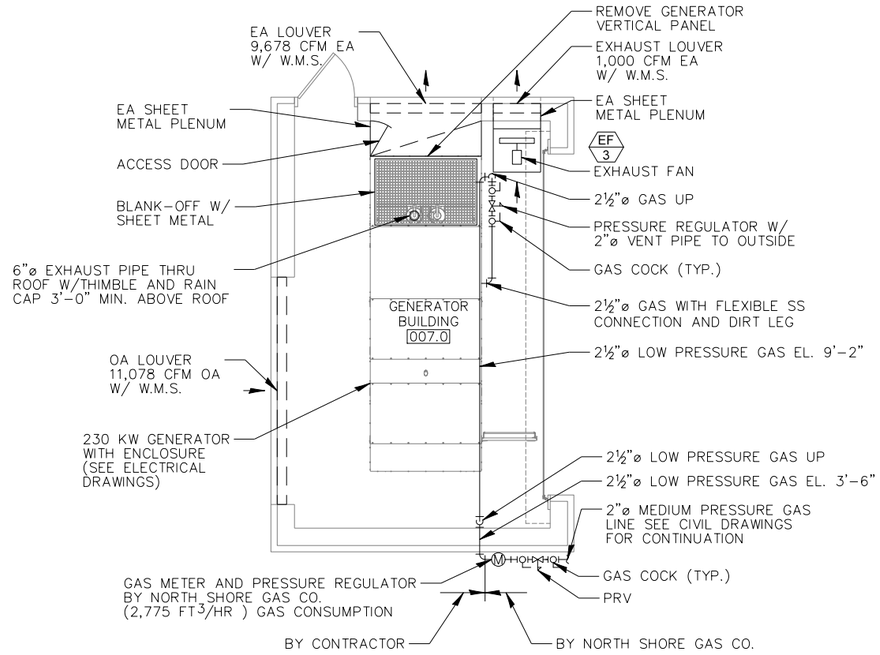
1 GENERATOR BUILDING HV ROOF PLAN

SCALE: ¼" = 1'-0"



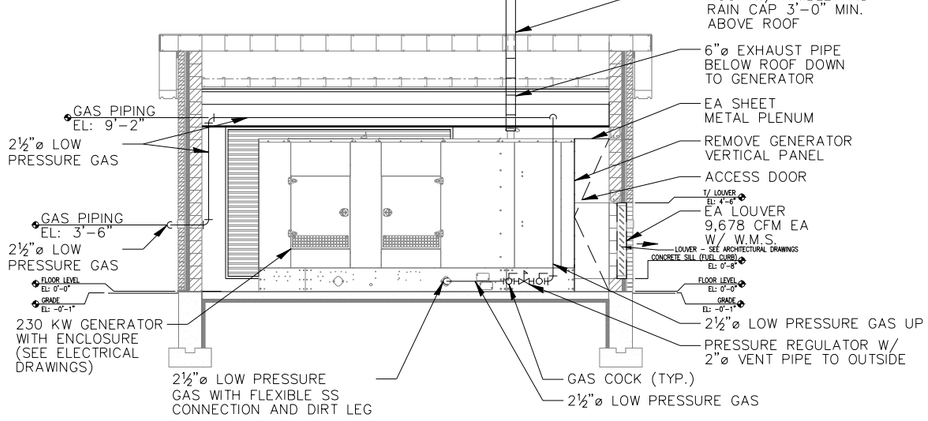
2 GENERATOR BUILDING HV CROSS SECTION

SCALE: ¼" = 1'-0"



1 GENERATOR BUILDING HV GROUND PLAN – EL: 671.50

SCALE: ¼" = 1'-0"



3 GENERATOR BUILDING HV LONGITUDINAL SECTION

SCALE: ¼" = 1'-0"

0 4' 8' 12' 16'

SCALE IN FEET

HV1.1

9/10/2019 7:44:50 AM
G:\LM161003 IDOT US 41 at Dearpath PS 38\00Model Files\100 PCT Submittal\7355 Pump Station- HV1.1-DEG.dgn

DELTA ENGINEERING GROUP, LLC

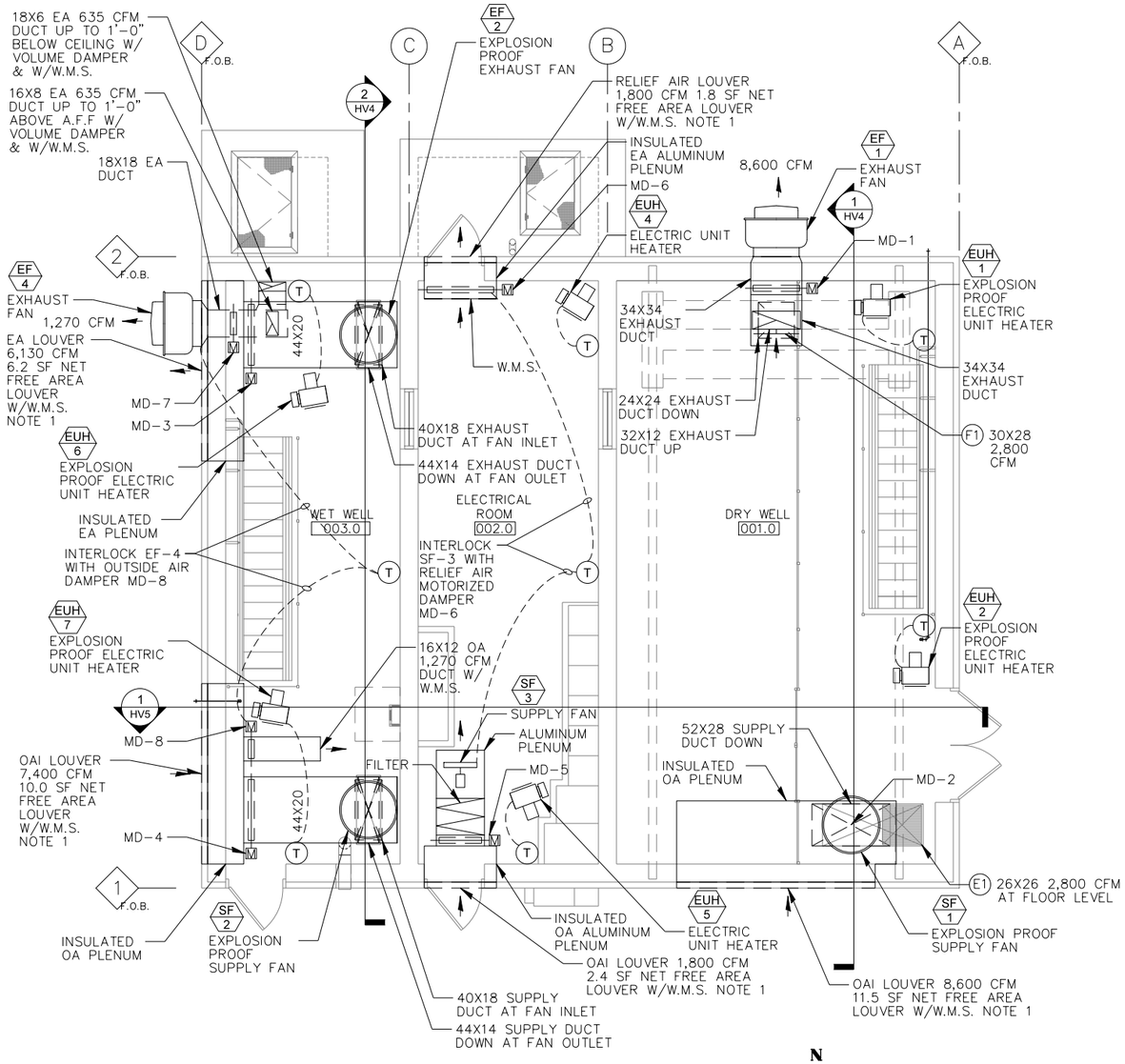
USER NAME = $USER$	DESIGNED MD	REVISED –	
	DRAWN AA	REVISED –	
PLOT SCALE = $SCALE$	CHECKED JB	REVISED –	
PLOT DATE = 9/10/2019	DATE 07/16/2019	REVISED –	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

GENERATOR BUILDING HV GROUND PLAN
PUMP STATION 38

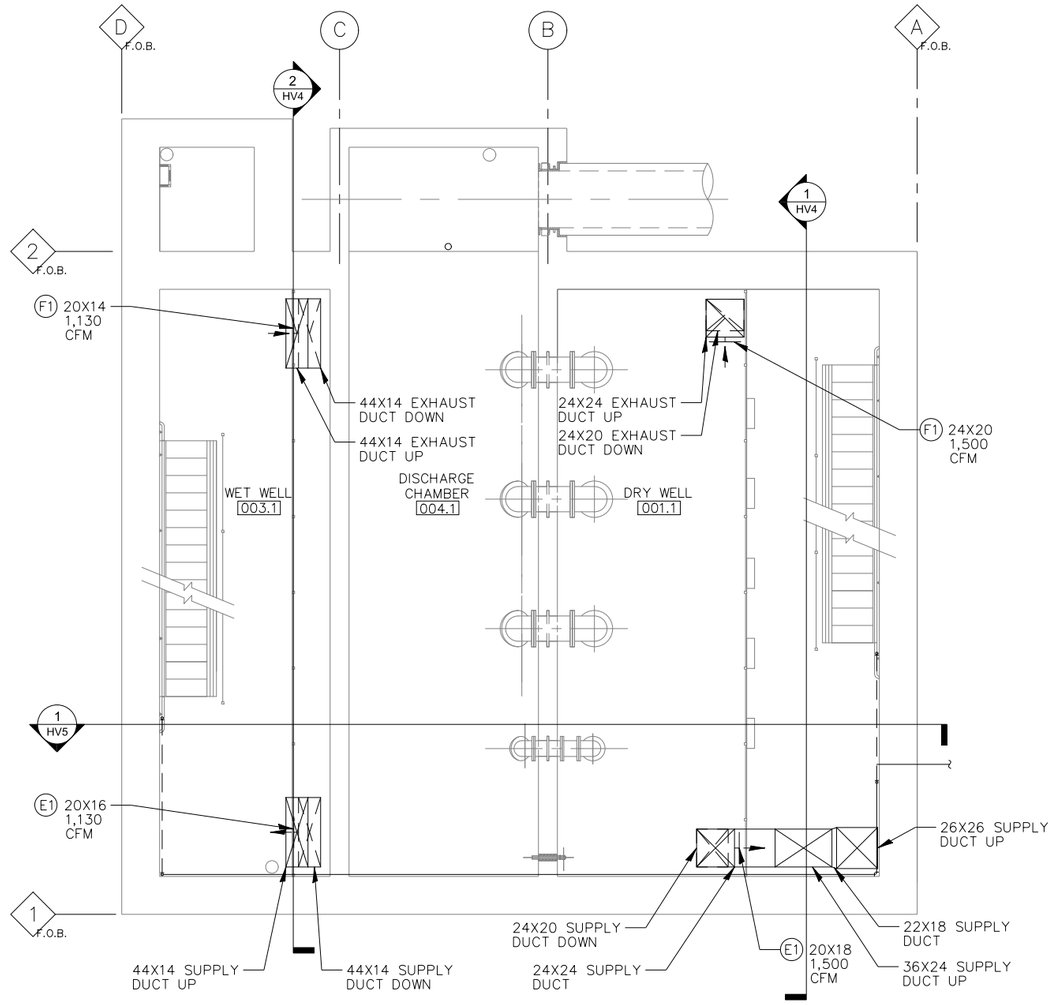
SCALE: AS SHOWN | SHEET NO. 2 OF 8 SHEETS

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F346 U1245	(21&21S)-I	LAKE	289	231
		CONTRACT NO. 62B65		
	ILLINOIS FED. AID PROJECT			



1 HV GROUND FLOOR PLAN – EL: 671.50

SCALE: ¼" = 1'-0"



2 HV INTERMEDIATE FLOOR PLAN (–1) – EL: 661.58 – DISCHARGE EL: 664.00 LP

SCALE: ¼" = 1'-0"

NOTE:

1. BLANK OFF UNUSED PORTION OF THE LOUVER W/INSULATED PANEL.
2. ALL DUCTWORK REGISTERS, MOTORIZED DAMPERS AND RELATED ACCESSORIES IN THE DRY WELL AND WET WELL AREAS SHALL BE STAINLESS STEEL.
3. ALL EQUIPMENT LOCATED IN THE DRY WELL AND WET WELL AREAS SHALL BE SUITABLE FOR CLASS 1, GROUP D, DIVISION 2 HAZARDOUS LOCATIONS.
4. ALL DUCTWORK, MOTORIZED DAMPERS AND RELATED ACCESSORIES IN THE ELECTRICAL ROOM SHALL BE ALUMINUM.

0 4' 8' 12' 16'

SCALE IN FEET

HV2

9/10/2019 7:47:44 AM
G:\LM161003 IDOT US 41 at Dearpath PS 38\00Model Files\100 PCT Submittal\7355 Pump Station- HV2-DEG.dgn

DELTA ENGINEERING GROUP, LLC

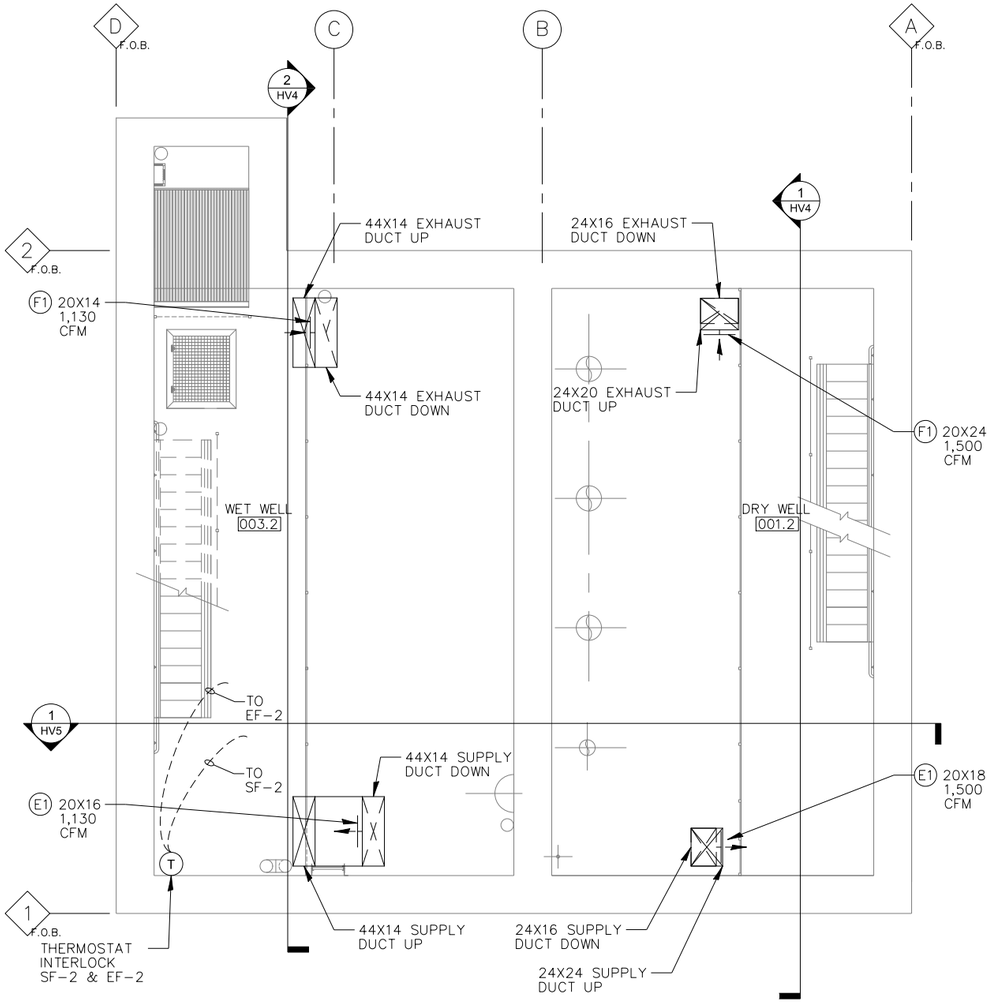
USER NAME = $USER$	DESIGNED MD	REVISED –	
	DRAWN AA	REVISED –	
PLOT SCALE = $SCALE$	CHECKED JB	REVISED –	
PLOT DATE = 9/10/2019	DATE 07/16/2019	REVISED –	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

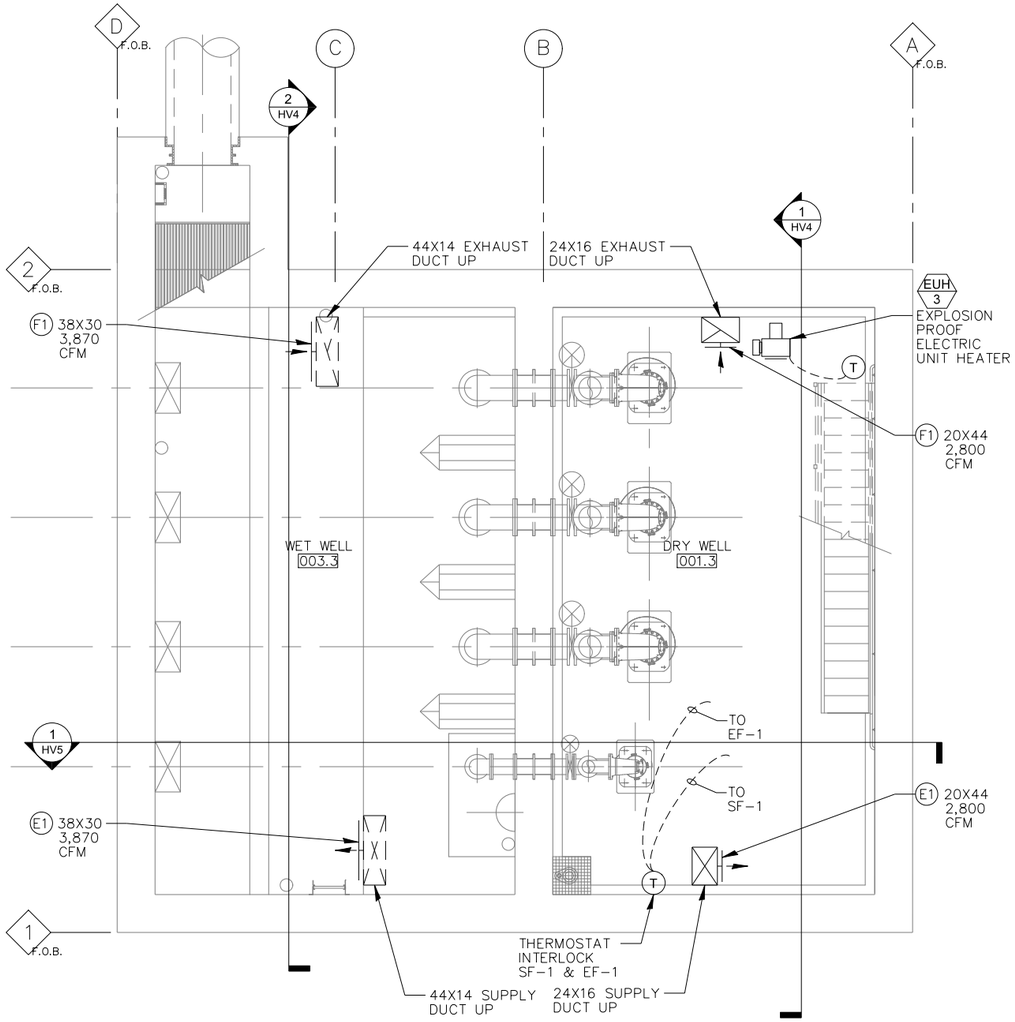
HV GROUND & INTERMEDIATE FLOOR PLANS
PUMP STATION 38

SCALE: AS SHOWN | SHEET NO. 3 OF 8 SHEETS

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
P346 U1245	(21&21S)-I	LAKE	289	232
		CONTRACT NO. 62B65		
		ILLINOIS FED. AID PROJECT		



1 HV INTERMEDIATE FLOOR PLAN (-2) – EL: 651.66
SCALE: ¼" = 1'-0"



2 HV WET WELL FLOOR PLAN (-3) – DRY EL: 641.00
– WET EL: 639.50
SCALE: ¼" = 1'-0"

0 4' 8' 12' 16'

SCALE IN FEET

HV3

9/10/2019 7:49:24 AM
G:\LM161003 IDOT US 41 at Dearpath PS 38\00Model Files\100 PCT Submittal\7355 Pump Station- HV3-DEG.dgn

DELTA ENGINEERING GROUP, LLC

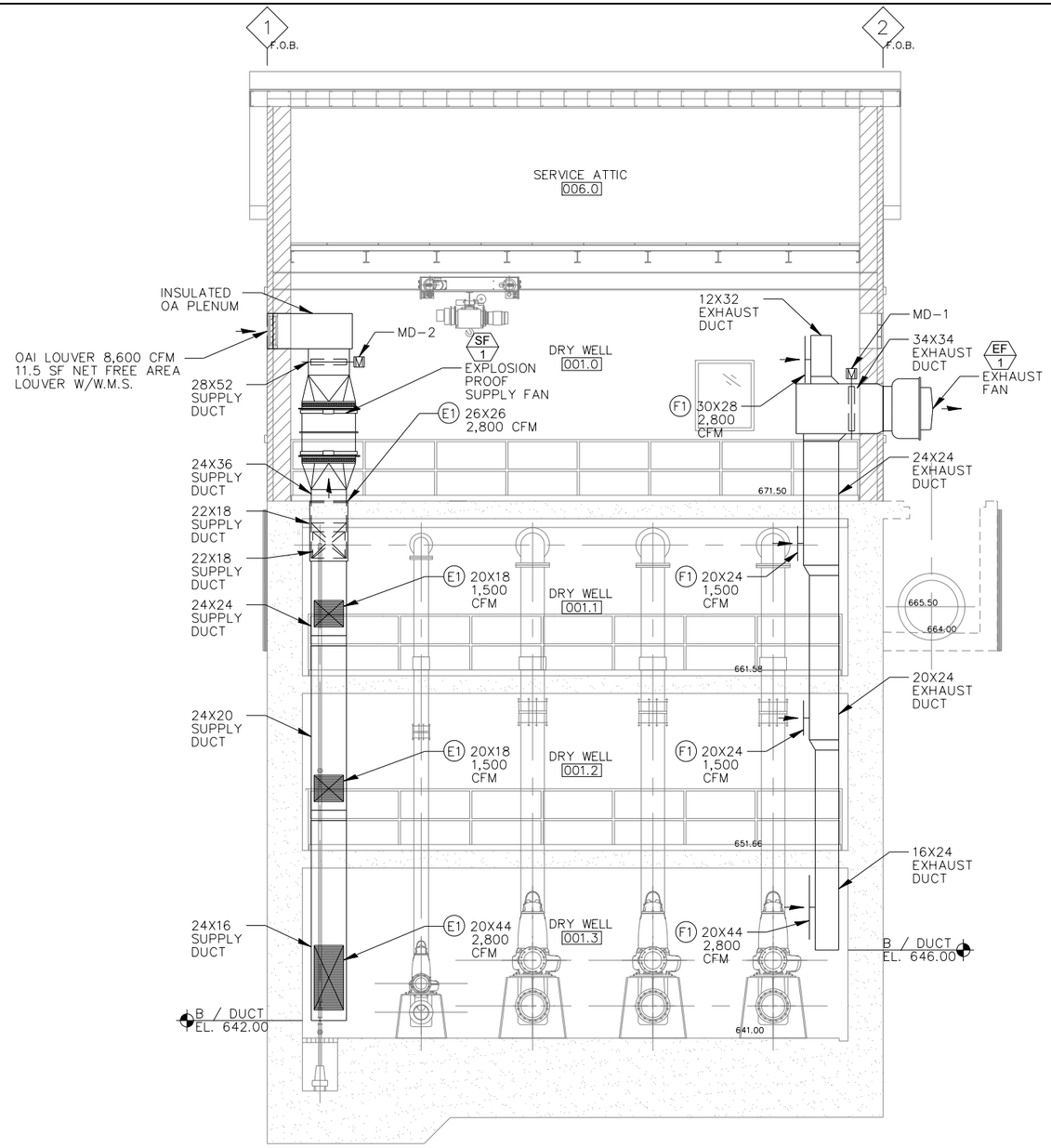
USER NAME = $USER$	DESIGNED MD	REVISED –	
	DRAWN AA	REVISED –	
PLOT SCALE = $SCALE$	CHECKED JB	REVISED –	
PLOT DATE = 9/10/2019	DATE 07/16/2019	REVISED –	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

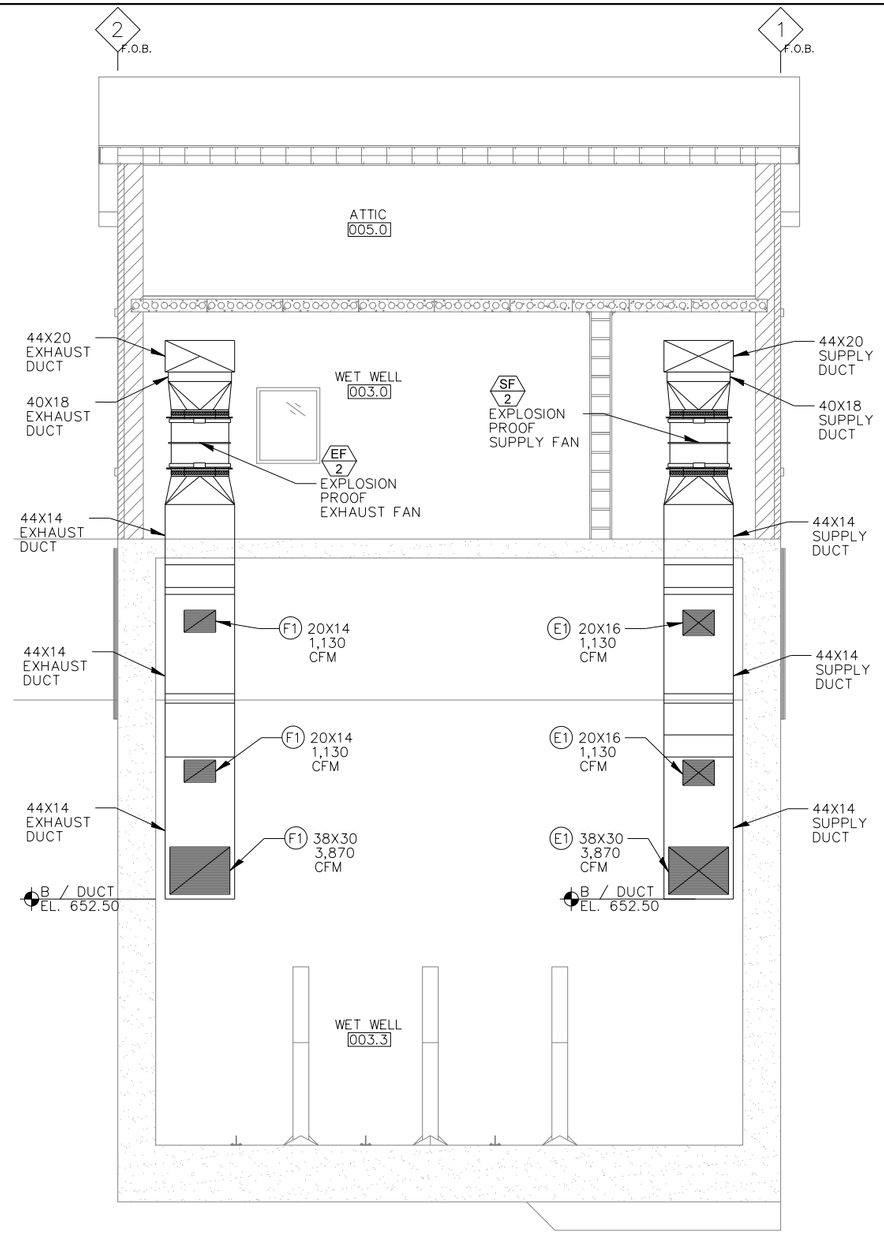
HV INTERMEDIATE & WET WELL FLOOR PLANS
PUMP STATION 38

SCALE: AS SHOWN | SHEET NO. 4 OF 8 SHEETS

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
P346 U1245	(21&21S)-I	LAKE	289	233
		CONTRACT NO. 62B65		
	ILLINOIS FED. AID PROJECT			



1 HV BUILDING SECTION
SCALE: ¼" = 1'-0"



2 HV BUILDING SECTION
SCALE: ¼" = 1'-0"

0 4' 8' 12' 16'

SCALE IN FEET

HV4

9/10/2019 7:49:46 AM
G:_M16\003 IDOT US 41 at Dearpath PS 38\00Model Files\100 PCT Submittal\7355 Pump Station- HV4-DEG.dgn

DELTA ENGINEERING GROUP, LLC

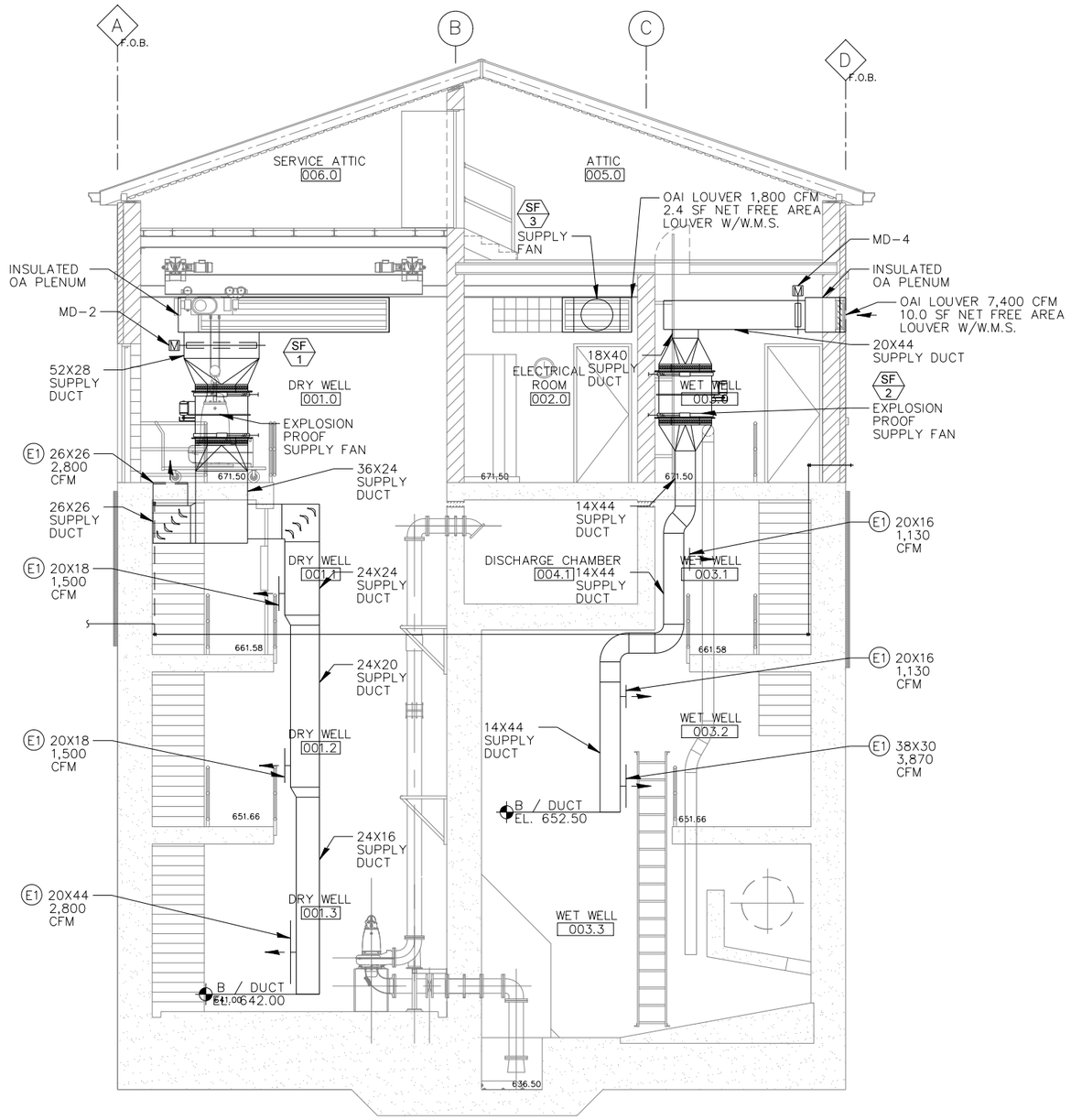
USER NAME = $USER$	DESIGNED MD	REVISED —	
	DRAWN AA	REVISED —	
PLOT SCALE = $SCALE$	CHECKED JB	REVISED —	
PLOT DATE = 9/10/2019	DATE 07/16/2019	REVISED —	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

HV BUILDING SECTIONS
PUMP STATION 38

SCALE: AS SHOWN | SHEET NO. 5 OF 8 SHEETS

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
P346 U1245	(21&21S)-I	LAKE	289	234
		CONTRACT NO. 62B65		
	ILLINOIS FED. AID PROJECT			



1 HV BUILDING SECTION

SCALE: ¼" = 1'-0"

0 4' 8' 12' 16'

SCALE IN FEET

HV5

9/10/2019 7:50:08 AM
G:_M161003 IDOT US 41 at Dearpath PS 38\00Model Files\100 PCT Submittal\7355 Pump Station- HV5-DEG.dgn

DELTA ENGINEERING GROUP, LLC

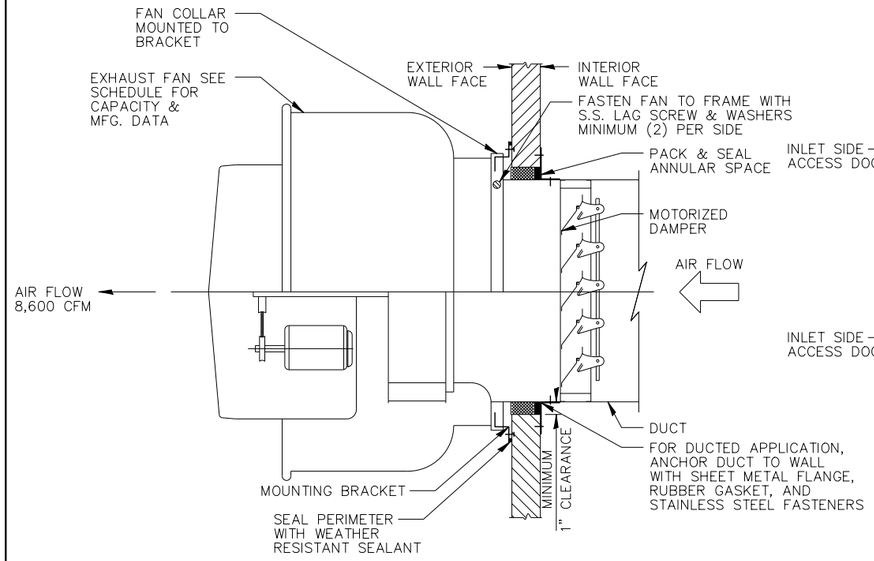
USER NAME = $USER$	DESIGNED MD	REVISED —	
	DRAWN AA	REVISED —	
PLOT SCALE = $SCALE$	CHECKED JB	REVISED —	
PLOT DATE = 9/10/2019	DATE 07/16/2019	REVISED —	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

HV BUILDING SECTIONS
PUMP STATION 38

SCALE: AS SHOWN | SHEET NO. 6 OF 8 SHEETS

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
P346 U1245	(21&21S)-I	LAKE	289	235
		CONTRACT NO. 62B65		
	ILLINOIS FED. AID PROJECT			

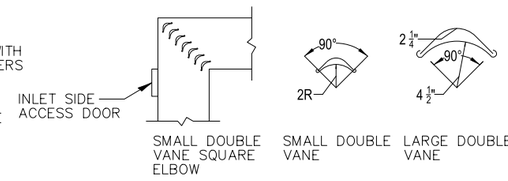


NOTES:

1. FAN EQUIPPED WITH HINGED KIT.
2. FOR ATTACHMENT TO WALL FOLLOW MANUFACTURER RECOMMENDATIONS.

1 TYPICAL SIDEWALL OUTSIDE FAN MOUNTING DETAIL EF-1 & EF-4

SCALE: NONE

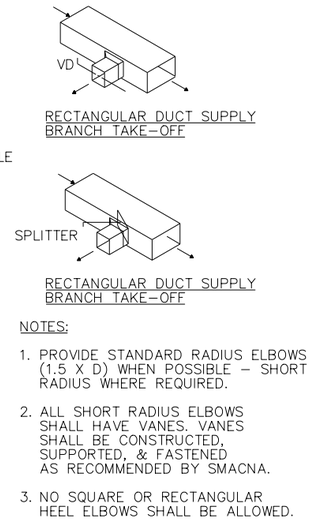


NOTES:

1. FOR DUCT WITH 2000 FPM VELOCITY AND ABOVE

2 DOUBLE VANE ELBOW DETAILS

SCALE: NONE



NOTES:

1. PROVIDE STANDARD RADIUS ELBOWS (1.5 X D) WHEN POSSIBLE – SHORT RADIUS WHERE REQUIRED.
2. ALL SHORT RADIUS ELBOWS SHALL HAVE VANES. VANES SHALL BE CONSTRUCTED, SUPPORTED, & FASTENED AS RECOMMENDED BY SMACNA.
3. NO SQUARE OR RECTANGULAR HEEL ELBOWS SHALL BE ALLOWED.

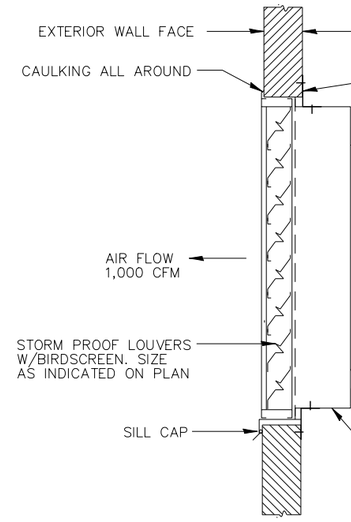
NOTES:

1. IF R IS LESS THAN W, THEN FULL ARC TURNING VANE(S) SHALL BE PROVIDED, SEE SCHEDULE BELOW.
2. INSIDE BEND MAY BE SQUARE FOR W > 12", NO SQUARE HEELS PERMITTED.

VANE SCHEDULE	
WIDTH	NO. OF VANES
* 12"	1
12"–24"	2
24"–36"	3
36"–60"	4
60"–84"	5
> 84"	6

3 TYPICAL DUCT DETAILS

SCALE: NONE

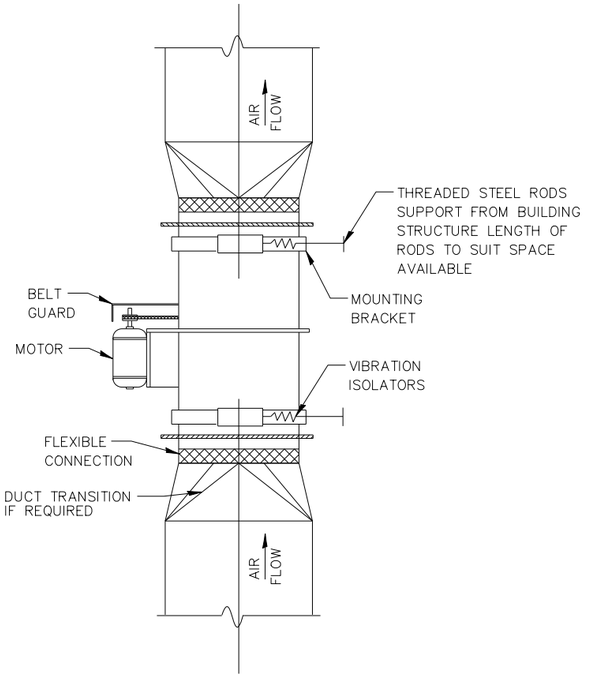


4 TYPICAL SIDEWALL INSIDE FAN MOUNTING DETAIL SF-3

SCALE: NONE

5 TYPICAL SIDEWALL INSIDE FAN MOUNTING DETAIL EF-3

SCALE: NONE



6 TYPICAL INLINE FAN DETAIL SF-1, SF-2 & EF-2

SCALE: NONE

HV6

9/10/2019 7:50:48 AM
G:\LM161003 IDOT US 41 at Dearpath PS 38\00Model Files\100 PCT Submittal\7355 Pump Station- HV6-DEG.dgn

DELTA ENGINEERING GROUP, LLC

USER NAME = $USER$	DESIGNED MD	REVISED –	
	DRAWN AA	REVISED –	
PLOT SCALE = $SCALE$	CHECKED JB	REVISED –	
PLOT DATE = 9/10/2019	DATE 07/16/2019	REVISED –	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

HV DETAILS
PUMP STATION 38

SCALE: AS SHOWN | SHEET NO. 7 OF 8 SHEETS

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
P.346 U1245	(21&21S)-I	LAKE	289	236
		CONTRACT NO. 62B65		
	ILLINOIS FED. AID PROJECT			

GENERATOR SCHEDULE

	CATERPILLAR 230 KW	GENERAC 230 KW	KOHLER 250 KW
NATURAL GAS CONSUMPTION 100% LOAD (CF/HR)	2,775	2,775	2,536
AIR FLOW BOTH COMBUSTION AND RADIATION (CFM)	10,072	10,072	23,032
HEAT REJECTION TO COOLANT (BTU/HR)	743,830	743,830	971,340
SUPPLY FINAL PRESSURE (INCHES H2O)	7' - 11"	7' - 11"	7' - 11"

FAN SCHEDULE

TAG	LOCATION	SERVICE	TYPE	MAXIMUM AIR QUANTITY (CFM)	TOTAL STATIC PRESSURE (IN. OF WATER)	FAN SPEED (RPM)	OUTLET VELOCITY (FPM)	DISCHARGE DIRECTION	DRIVE A: BELT B: DIRECT	FAN MOTOR DATA						WEIGHT (LBS)	MANUFACTURER	MODEL NO.	REMARKS
										MOTOR BHP	MOTOR HP	SPEED (RPM)	VOLTAGE	PHASE	HERTZ				
SF-1	DRY WELL	DRY WELL	IN LINE CENTRUFIGAL	8,600	1.0	608	--	HORIZONTAL	A	2.54	3.0	1,750	480	3	60	956	TWIN CITY FAN	TCLB330A1	1, 2, 3, 5, 6
SF-2	WET WELL LOWER LEVEL	WET WELL	IN LINE CENTRUFIGAL	6,130	1.0	926	702	HORIZONTAL	A	1.93	3.0	1,750	480	3	60	475	TWIN CITY FAN	TCLB245A1	1, 2, 3, 5, 6
SF-3	ELECTRICAL	ELECTRICAL	PROPELLER	1,800	1.0	--	--	HORIZONTAL	A	0.55	0.8	1,800	480	3	60	469	TWIN CITY FAN	WPB24B105	1, 2, 4
EF-1	DRY WELL	DRY WELL	WALL EXHAUSTER CENTRUFIGAL	8,600	1.0	917	583	HORIZONTAL	A	2.41	3.0	1,750	480	3	60	350	TWIN CITY FAN	BCRW300EHP	1, 2, 3, 6
EF-2	WET WELL LOWER LEVEL	WET WELL	IN LINE CENTRUFIGAL	6,130	1.0	926	702	HORIZONTAL	A	1.93	3.0	1,750	480	3	60	475	TWIN CITY FAN	TCLB245A1	1, 2, 3, 5, 6
EF-3	GENERATOR BUILDING	GENERATOR BUILDING	PROPELLER	1,000	0.5	1,276	_	HORIZONTAL	A	0.16	0.25	1,750	460	3	60	152	TWIN CITY FAN	WPB21B105	1, 2
EF-4	WET WELL GRADE LEVEL	WET WELL GRADE LEVEL	WALL EXHAUSTER CENTRUFIGAL	1,270	0.5	971	_	HORIZONTAL	A	0.19	0.25	1,750	120	1	60	166	TWIN CITY FAN	BCRW140EHP	1, 2, 3, 6

NOTES:

1. PROVIDE ELECTRICAL DISCONNECT TO BE INSTALLED BY ELECTRICAL CONTRACTOR.
2. ALL MOTOR STARTERS PROVIDED BY ELECTRICAL CONTRACTOR.
3. PROVIDE EXPLOSION PROOF MOTOR ENCLOSURE SUITABLE FOR CLASS 1, GROUP D, DIVISION 2 HAZARDOUS LOCATIONS.
4. PROVIDE 2" ALUMINUM WASHABLE FILTERS WITH HOUSING ACCESS DOOR.
5. PROVIDE SPRING HANGER VIBRATION ISOLATORS.
6. ALL EQUIPMENTS SHALL BE SUITABLE FOR CLASS 1, GROUP D, DIVISION 2 HAZARDOUS LOCATIONS.

MOTORIZED DAMPER SCHEDULE

TAG	SERVING	FUNCTION	OPERATION	BLADE TYPE	DAMPER SIZE IN X IN	CFM	FACE VELOCITY (FPM)	ACTION	MATERIAL	VOLTAGE	PHASE	HERTZ	MANUFACTURER	MODEL NO.	REMARKS
MD-1	EF-1	EA	ELECTRIC	PARALLEL BLADE	34 X 34	8,600	1,071	TWO POSITION	SS	120	1	60	NAILOR INDUSTRIES, INC	1,010	1, 2, 3
MD-2	SF-1	OA	ELECTRIC	PARALLEL BLADE	52 X 28	8,600	851	TWO POSITION	SS	120	1	60	NAILOR INDUSTRIES, INC	1,010	1, 2, 3
MD-3	EF-2	EA	ELECTRIC	PARALLEL BLADE	44 X 20	6130	1,000	TWO POSITION	SS	120	1	60	NAILOR INDUSTRIES, INC	1010	1, 2, 3
MD-4	SF-2	OA	ELECTRIC	PARALLEL BLADE	44 X 20	6,130	1,000	TWO POSITION	SS	120	1	60	NAILOR INDUSTRIES, INC	1,010	1, 2, 3
MD-5	SF-3	SA	ELECTRIC	PARALLEL BLADE	28 X28	1,800	331	TWO POSITION	AL	120	1	60	NAILOR INDUSTRIES, INC	2010IB	1, 3
MD-6	RELIEF AIR	EA	ELECTRIC	PARALLEL BLADE	48 X 24	1,800	225	TWO POSITION	AL	120	1	60	NAILOR INDUSTRIES, INC	2010IB	1, 3
MD-7	OUTSIDE AIR	OA	ELECTRIC	PARALLEL BLADE	16 X 12	1270	953	TWO POSITION	SS	120	1	60	NAILOR INDUSTRIES, INC	1020	1, 2, 3
MD-8	EF-4	EA	ELECTRIC	PARALLEL BLADE	18 X 18	1,270	564	TWO POSITION	SS	120	1	60	NAILOR INDUSTRIES, INC	1,020	1, 2, 3

NOTES:

1. DAMPERS SHALL BE INSULATED BLADE TYPE.
2. DAMPERS ACTUATION SHALL BE IN AN EXPLOSION PROOF ENCLOSURE SUITABLE FOR CLASS 1, GROUP D, DIVISION 2 HAZARDOUS LOCATIONS.
3. DAMPERS SHALL BE PROVIDED WITH A PROOF-OF-OPEN LIMIT SWITCH.

AIR INLETS AND OUTLETS SCHEDULE

TAG	SERVICE	DAMPER	NECK SIZE INCH	MATERIAL	CEILING TYPE	MANUFACTURER	MODEL NO.	REMARKS
E1	SUPPLY	SEE PLANS	SEE PLANS	STAINLESS STEEL	EXPOSED	NAILOR INDUSTRIES, INC	67DH-O	DOUBLE DEFLECTION WITH HORIZONTAL FRONT BARS SUPPLY REGISTER WITH OPPOSED BLADES DAMPER
F1	EXHAUST	SEE PLANS	SEE PLANS	STAINLESS STEEL	EXPOSED	NAILOR INDUSTRIES, INC	6745H-O	HORIZONTAL SINGLE DEFLECTION FIXED 45 DEGREE FACE BARS EXHAUST REGISTER WITH OPPOSED BLADES DAMPER

ELECTRIC UNIT HEATER SCHEDULE

TAG	LOCATION	TYPE	AIR QUANTITY (CFM)	FAN MOTOR					HEATING COIL				WEIGHT (LBS)	MANUFACTURER	MODEL NO.	REMARKS
				MOTOR HP	VOLT	PHASE	HERTZ	DISCONNECT SWITCH (YES/NO)	KW	VOLT	PHASE	HETRZ				
EUH-1	DRY WELL	HORIZONTAL	400	1/4	480	3	60	YES	5	480	3	60	188	OUELLET	OHX050	1,2,3
EUH-2	DRY WELL	HORIZONTAL	400	1/4	480	3	60	YES	5	480	3	60	188	OUELLET	OHX050	1.2.3
EUH-3	DRY WELL	HORIZONTAL	400	1/4	480	3	60	YES	5	480	3	60	188	OUELLET	OHX050	1,2,3
EUH-4	ELECTRICAL ROOM	HORIZONTAL	625	1/33	480	3	60	YES	7.5	480	3	60	67	OUELLET	OHVU075	3
EUH-5	ELECTRICAL ROOM	HORIZONTAL	625	1/33	480	3	60	YES	7.5	480	3	60	67	OUELLET	OHVU075	3
EUH-6	WET WELL	HORIZONTAL	350	1/4	480	3	60	YES	3	480	3	60	188	OUELLET	OHX030	1,2,3
EUH-7	WET WELL	HORIZONTAL	350	1/4	480	3	60	YES	3	480	3	60	188	OUELLET	OHX030	1,2,3

NOTE:

1. PROVIDE EXPLOSION PROOF FAN, THERMALLY PROTECTED, PERMANENTLY LUBRICATED.
2. HEATER SHALL SUITABLE FOR CLASS 1, GROUP D, DIVISION 2 HAZARDOUS LOCATIONS.
3. WALL MOUNTED THERMOSTAT FURNISHED BY UNIT MANUFACTURER.

VENTILATION SCHEDULE

ROOM NO.	ROOM NAME	LOCATION	FLOOR AREA SQ. FT.	ORDINANCE REQUIREMENTS		PLAN REQUIREMENTS		FAN	SYSTEM	REMARKS
				CFM AIR SUPPLY	CFM AIR EXHAUST	CFM AIR SUPPLY	CFM AIR EXHAUST	SUPPLY FAN	EXHAUST FAN	
001	DRY WELL	GROUND FLOOR	572	NR	NR	2,800	2,800	SF-1	EF-1	
002	ELECTRICAL ROOM	GROUND FLOOR	323	NR	NR	1,800	1,800	SF 3	RO	
003	WET WELL	GROUND FLOOR	313	NR	NR	1,270	1,270	RO	EF-4	
001.1	DRY WELL	INTERMEDIATE FLOOR (-1)	527	NR	NR	1,500	1,500	SF-1	EF-1	
003.1	WET WELL	INTERMEDIATE FLOOR (-1)	279	NR	NR	1,130	1,130	SF-2	EF-2	
004.1	DISCHARGE CHAMBER	INTERMEDIATE FLOOR (-1)	323	NR	NR	-	-	-	-	
001.2	DRY WELL	INTERMEDIATE FLOOR (-2)	527	NR	NR	1,500	1,500	SF-1	EF-1	
003.2	WET WELL	INTERMEDIATE FLOOR (-2)	279	NR	NR	1,130	1,130	SF-2	EF-2	
001.3	DRY WELL	WET WELL FLOOR (-3)	527	NR	NR	2,800	2,800	SF-1	EF-1	
003.3	WET WELL	WET WELL FLOOR (-3)	589	NR	NR	3,870	3,870	SF-2	EF-2	
-	**TOTAL**	-	**4,259**	**0**	**0**	**17,800**	**17,800**	-	-	-

NR = NOT REQUIRED
RO = RELIEF OPENING

HV7

DELTA ENGINEERING GROUP, LLC

USER NAME = $USER$	DESIGNED MD	REVISED —	
	DRAWN AA	REVISED —	
PLOT SCALE = $SCALE$	CHECKED JB	REVISED —	
PLOT DATE = 9/10/2019	DATE 07/16/2019	REVISED —	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

HV SCHEDULES
PUMP STATION 38

SCALE: AS SHOWN | SHEET NO. 8 OF 8 SHEETS

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.U. 1245	(21&21S)-I	LAKE	289	237
		CONTRACT NO. 62B65		
		ILLINOIS FED. AID PROJECT		

9/10/2019 7:51:14 AM
G:\LM161003 IDOT US 41 at Dearpath PS 38\00Model Files\100 PCT Submittal\7355 Pump Station- HV7-DEG.dgn

BUILDING PLANS

- POWER PANELBOARD
- SURFACE MOUNTED CONTROL PANELBOARD
- MANUAL DISCONNECT SWITCH NONFUSED (RATING AS INDICATED)
- MANUAL DISCONNECT SWITCH FUSED (RATING AS INDICATED)
- MAGNETIC MOTOR STARTER (RATING AS INDICATED)
- COMBINATION MAGNETIC MOTOR STARTER AND FUSED DISCONNECT SWITCH (RATING AS INDICATED)
- CONTROL STATION (1, 2 & 3 BUTTONS SHOWN)
- 50HP — SINGLE SPEED ELECTRIC MOTOR (KW OR HP RATING AS INDICATED)
- MD — MOTORIZED DAMPER
- L — LIMIT SWITCH
- OS — INTRUSION ALARM OVERRIDE SWITCH RECESSED IN WALL
- MS — MAGNETICALLY OPERATED REED SWITCH
- F — FLOAT SWITCH
- PS — PRESSURE SWITCH
- FS — FLOW SWITCH
- EP — ELECTRIC - PNEUMATIC SWITCH
- PE — PNEUMATIC - ELECTRIC SWITCH
- TQ — TORQUE SWITCH
- T — TRANSFORMER
- P — FIRE ALARM PULL STATION
- AV — AUDIO VISUAL ALARM
- SD — SMOKE DETECTOR
- HD — HEAT DETECTOR
- FD — FLAME DETECTOR
- GD — COMBUSTIBLE GAS DETECTOR
- T — THERMOSTAT
- UH — UNIT HEATER - DOWNBLAST TYPE OR CENTRIFUGAL FAN TYPE
- ALARM HORN
- GROUND GRID
- GROUND ROD
- GROUND TEST WELL
- LIGHTNING CONDUCTOR
- PB — ELECTRIC PULL BOX
- J — ELECTRIC JUNCTION BOX
- HANDHOLE COMPOSITE CONCRETE

BUILDING PLANS

- F1-2a — LED FIXTURE F1 INDICATES FIXTURE TYPE- REFER TO FIXTURE SCHEDULE 2a INDICATES CIRCUIT NO. 2 ON SWITCH a (TYP.)
- LED FIXTURE
- WALL MOUNTED LED FIXTURE
- LED FIXTURE ON EMERGENCY CIRCUIT
- LED FIXTURE ON EMERGENCY CIRCUIT
- EXIT SIGN SINGLE SIDED (ABOVE DOOR)
- DIRECTIONAL EXIT SIGN - DOUBLE SIDED (DIRECTION AS INDICATED - TYP.)
- DIRECTIONAL EXIT SIGN - SINGLE SIDED
- BATTERY UNIT FOR EMERGENCY LIGHT
- BATTERY OPERATED EMERGENCY LIGHT WITH TWO HEADS
- EMERGENCY LIGHT, REMOTE HEAD
- BARE GROUND CABLE
- EXPOSED CONDUIT
- CONCEALED CONDUIT IN FLOOR OR UNDERGROUND
- LP-1-6 — CONDUIT HOME-RUN TO PANEL AS INDICATED (LP-1-6 DENOTES PANEL DESIGNATION, SLASH LINES INDICATE QUANTITY OF WIRE, GROUND WIRE INDICATED AS LONG LINE WITH DOT, NEUTRAL WIRE INDICATED AS LONG LINE, PHASE WIRES AND SWITCH LEGS INDICATED AS SHORT LINES)
- CONDUIT TURNED DOWN
- CONDUIT TURNED UP
- CONDUIT TERMINATED OR CAPPED
- SINGLE POLE TOGGLE SWITCH
- T — MANUAL MOTOR STARTER SWITCH WITH THERMAL OVERLOAD PROTECTION
- TMR — TIMED-ON SWITCH
- SINGLE RECEPTACLE
- DUPLEX RECEPTACLE
- QUADRUPLEX RECEPTACLE
- GFCI — DUPLEX RECEPTACLE WITH GROUND FAULT CIRCUIT INTERRUPTER
- IG — DUPLEX RECEPTACLE WITH ISOLATED GROUND

SCHEMATIC SYMBOLS

- CONDUCTOR CONNECTION
- NO CONNECTION
- TERMINAL ON A DEVICE
- NORMALLY OPEN CONTACT
- NORMALLY CLOSED CONTACT

SCHEMATIC SYMBOLS

- SINGLE POLE, SINGLE THROW SWITCH
- SINGLE POLE, DOUBLE THROW SWITCH
- DOUBLE POLE, SINGLE THROW SWITCH
- DOUBLE POLE, DOUBLE THROW SWITCH
- THREE WAY ROTARY SWITCH
- NORMALLY CLOSED MOMENTARY PUSH BUTTON SWITCH
- NORMALLY OPEN MOMENTARY PUSH BUTTON SWITCH
- EMERGENCY STOP BUTTON - MAINTAINED
- 1 2 — 2 POSITION SELECTOR SWITCH (EXTRA CONTACT BLOCK)
- 1 2 — NORMALLY OPEN DOUBLE BREAK SINGLE THROW CONTACT BLOCK
- 1 2 — NORMALLY CLOSED DOUBLE BREAK SINGLE THROW CONTACT BLOCK
- 1 2 — DOUBLE BREAK DOUBLE THROW CONTACT BLOCK
- MUSHROOM HEAD PUSH BUTTON
- MAINTAINED CONTACT PUSH BUTTON
- 1 2 — 2 OR 3 POSITIONS SELECTOR SWITCH (CLOSED CONTACTS INDICATED BY "X")
- 3 POLE SINGLE THROW DISCONNECT SWITCH
- HEATER ELEMENT SWITCH - CLOSES ON RISING TEMPERATURE
- HEATER ELEMENT SWITCH - OPENS ON RISING TEMPERATURE
- PRESSURE SWITCH - CLOSES ON RISING PRESSURE
- PRESSURE SWITCH - OPENS ON RISING PRESSURE
- AUTOMATIC TRANSFER SWITCH

SCHEMATIC SYMBOLS

- DIFFERENTIAL PRESSURE SWITCH - CLOSES WHEN THE DIFFERENTIAL IN PRESSURE BETWEEN TWO DIAPHRAGMS EXCEEDS A SET POINT
- DIFFERENTIAL PRESSURE SWITCH - OPENS WHEN THE DIFFERENTIAL IN PRESSURE BETWEEN TWO DIAPHRAGMS EXCEEDS A SET POINT
- TIME DELAY RELAY SWITCH -CLOSES ON TIME DELAY AFTER ENERGIZATION OF RELAY COIL
- TIME DELAY RELAY SWITCH -OPENS ON TIME DELAY AFTER ENERGIZATION OF RELAY COIL
- TIME DELAY RELAY SWITCH -OPENS ON TIME DELAY AFTER DE-ENERGIZATION OF RELAY COIL
- TIME DELAY RELAY SWITCH -CLOSES ON TIME DELAY AFTER DE-ENERGIZATION OF RELAY COIL
- LEVEL SWITCH - CLOSES ON RISING LEVEL
- LEVEL SWITCH - OPENS ON RISING LEVEL
- FLOW SWITCH - CLOSES ON FLOW
- FLOW SWITCH - OPENS ON FLOW
- N.O. LIMIT SWITCH
- TRANSFORMER TYPE AND RATED AS INDICATED
- CONNECTION TO GROUND
- LIGHTNING OR SURGE ARRESTER
- THERMAL OVERLOAD ELEMENT
- CIRCUIT BREAKER
- HEATING ELEMENT
- SV — SOLENOID VALVE
- DEVICE ENCLOSURE
- ANN — ANNUNCIATOR
- COUNT — COUNTER
- ETM — ELAPSED TIME METER
- TMR — ELECTRONIC TIMER
- TOT — TOTALIZER
- PSC — PUMP START COUNTER
- R — INDICATOR LIGHT (SEE SCHEMATIC DIAGRAM DEVICE TABLE FOR COLOR SYMBOLS)
- R — INDICATOR LIGHT (PUSH TO TEST TYPE)
- TIMED-ON SWITCH
- CURRENT SWITCH

SCHEMATIC SYMBOLS

M — COIL
- C - CLOSE
- CR - CONTROL RELAY
- F - FAST OR FORWARD
- M - MOTOR STARTER
- MX - MOTOR STARTER AUXILIARY RELAY
- N - NORMAL
- O - OPEN
- OL - OVERLOAD RELAY
- R - REVERSE
- S - SLOW
- TD - TIME DELAY RELAY
- TDAE - TIME DELAY AFTER ENERGIZATION
- TDAD - TIME DELAY AFTER DE-ENERGIZATION

ONE-LINE DIAGRAMS

- POWER CIRCUIT
- EQUIPMENT ENCLOSURE
- CONTROL OR INTERLOCK CIRCUIT
- BUS (RATING AS INDICATED)
- CONDUCTOR CONNECTION
- DRAWOUT DEVICE
- DRAWOUT MOLDED CASE CIRCUIT BREAKER (600V, THERMAL MAGNETIC TYPE, UNLESS NOTED OTHERWISE)
  - 500AT, 600AF
  - TRIP SETTING (TYP.)
  - FRAME SIZE (TYP.)
- MOLDED CASE CIRCUIT BREAKER (600V, THERMAL MAGNETIC TYPE, UNLESS NOTED OTHERWISE)
- FUSE (RATING AS INDICATED)
- DRAWOUT FUSE (RATING AS INDICATED)
- FUSE - SWITCH (RATING AS INDICATED)
- NON-FUSIBLE DISCONNECT SWITCH
- THERMAL OVERLOAD ELEMENT
- INSTANTANEOUS CONTACT
- CURRENT TRANSFORMER-DOUGHNOUT TYPE (QUANTITY, RATIO AND RATING AS INDICATED)
- CURRENT TRANSFORMER-WINDOW TYPE (RATIO AND RATING AS INDICATED)
- POTENTIAL TRANSFORMER (QUANTITY, RATIO AND RATING AS INDICATED)
- CAPACITOR
- BATTERY
- AS — AMMETER SWITCH
- VS — VOLTMETER SWITCH
- SS — SELECTOR SWITCH
- A — AMMETER (RANGE AS INDICATED)

ONE-LINE DIAGRAMS

- V — VOLTMETER (RANGE AS INDICATED)
- KWH — KILOWATHOUR METER
- M — MICROPROCESSOR METERING DEVICE
- CONTROL STATION
- TRANSFER SWITCH (TYPE AND RATING AS INDICATED)
- SINGLE SPEED NON-REVERSING MANUAL STARTER (NEMA OR IEC DESIGNATION AS SPECIFIED OR SHOWN)
- SINGLE SPEED NON-REVERSING MAGNETIC STARTER (NEMA OR IEC DESIGNATION AS SPECIFIED OR SHOWN)
- COMBINATION CIRCUIT BREAKER & SINGLE SPEED NON-REVERSING MAGNETIC STARTER (NEMA OR IEC DESIGNATION AS SPECIFIED OR SHOWN)
- COMBINATION DISCONNECT SWITCH & SINGLE SPEED NON-REVERSING STARTER (NEMA OR IEC DESIGNATION AS SPECIFIED OR SHOWN)
- G E — ENGINE GENERATOR
- GFR — GROUND FAULT RELAY

ABBREVIATIONS

A	AMMETER
AFF	ABOVE FINISHED FLOOR
AS	AMMETER SWITCH
COMED	COMMONWEALTH EDISON
CPT	CONTROL POWER TRANSFORMER
CR	CONTROL RELAY
DS1	DISCONNECT SWITCH #1
DS-1	DOOR SWITCH #1
EF	EXHAUST FAN
EUH	ELECTRIC UNIT HEATER
FLS	FLOAT LEVEL SWITCH
F.O.B.	FACE OF BUILDING
GD	GAS DETECTOR
GM	GAS MONITORING PANEL
HD	HEAT DETECTOR
JB	JUNCTION BOX
LFP	LOW FLOW PUMP
LP	LIGHTING PANELBOARD
LS	LIMIT SWITCH
MCP	MINIMUM CURRENT PROTECTION
MD	MOTORIZED DAMPER
MH	MOUNTING HEIGHT
MP-1	MAIN PUMP #1
PDR	PUMP DELAY RELAY
PP	POWER PANEL
PPR	PUMP PROTECTION RELAY
RTM	RELAY TEMP/MOISTURE
RTR	RELAY TIMED RUN
RTU	REMOTE TERMINAL UNIT
SD	SMOKE DETECTOR
SF	SUPPLY FAN
SG	SLIDE GATE
SS	SELECTOR SWITCH
T	THERMOSTAT
TMR	TIMER
TQ	TORQUE SWITCH
TS	TEMPERATURE SWITCH
UH	UNIT HEATER
WP	WEATHERPROOF
XP	EXPLOSION PROOF

XX / X
- EQUIPMENT TYPE
- EQUIPMENT TAG
- EQUIPMENT NO.

E1

FILE NAME = L:\7955\CAD\Sheets\Building\Electrical\Pump Station 38 - Electrical Drawings\ELECTRICAL 1 SYMBOL LIST.dgn

KNIGHT Engineers & Architects

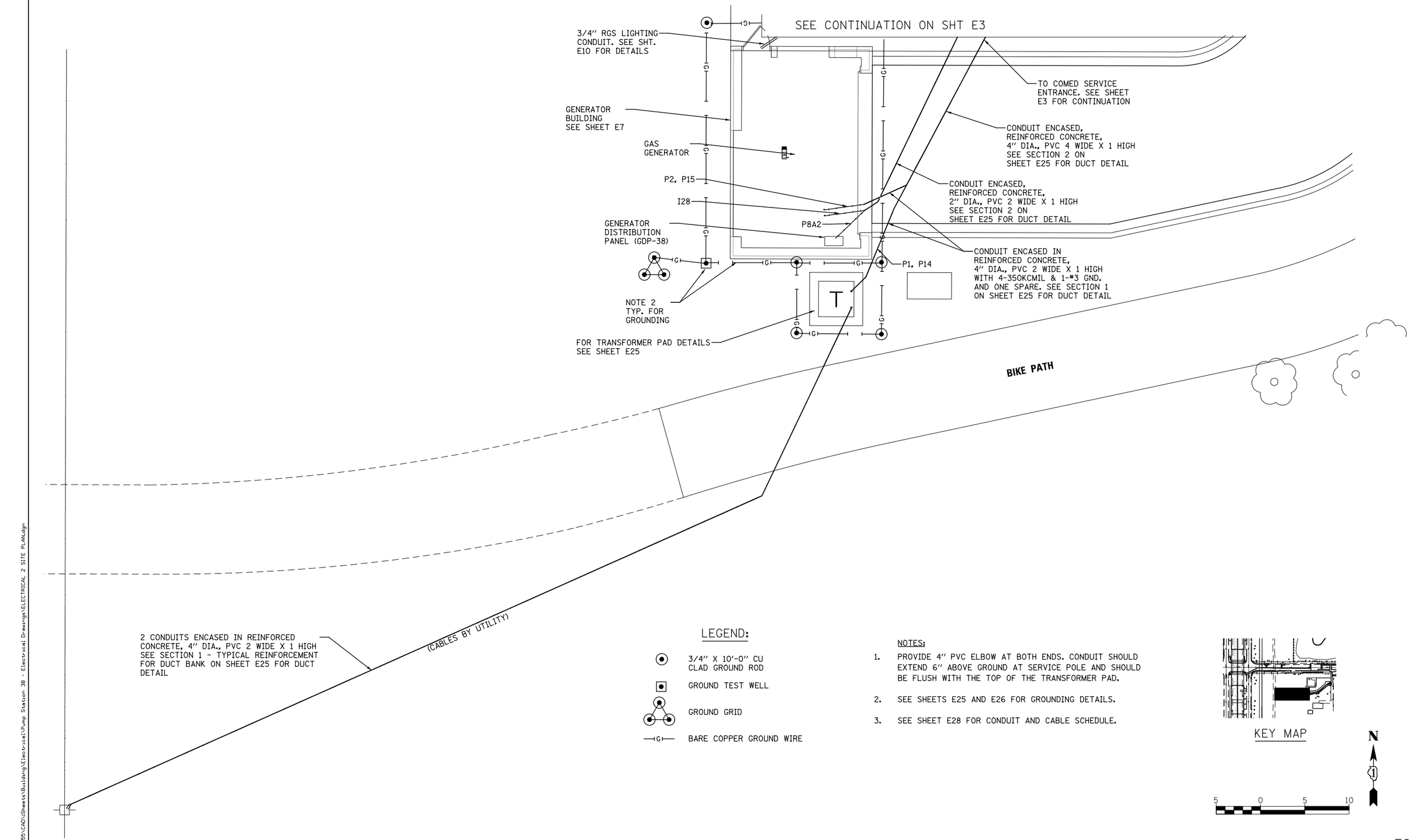
USER NAME = cliss	DESIGNED PNS	REVISED -
	DRAWN MB	REVISED -
PLOT SCALE = 1:2	CHECKED JWM	REVISED -
PLOT DATE = 6/25/2020	DATE 06/26/20	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ELECTRICAL SYMBOL LIST
PUMP STATION 38

SCALE: | SHEET 1 OF 1 SHEETS | STA. | TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	238
		CONTRACT NO. 62B65		
	ILLINOIS FED. AID PROJECT			



LEGEND:

- 3/4" X 10'-0" CU CLAD GROUND ROD
- GROUND TEST WELL
- GROUND GRID
- BARE COPPER GROUND WIRE

NOTES:

1. PROVIDE 4" PVC ELBOW AT BOTH ENDS. CONDUIT SHOULD EXTEND 6" ABOVE GROUND AT SERVICE POLE AND SHOULD BE FLUSH WITH THE TOP OF THE TRANSFORMER PAD.
2. SEE SHEETS E25 AND E26 FOR GROUNDING DETAILS.
3. SEE SHEET E28 FOR CONDUIT AND CABLE SCHEDULE.

KEY MAP

N

5 0 5 10

E2

FILE NAME = L:\7395\CADD\Sheets\Building\Electrical\Pump Station 38 - Electrical Drawings\ELECTRICAL 2 SITE PLAN.dgn

KNIGHT Engineers & Architects

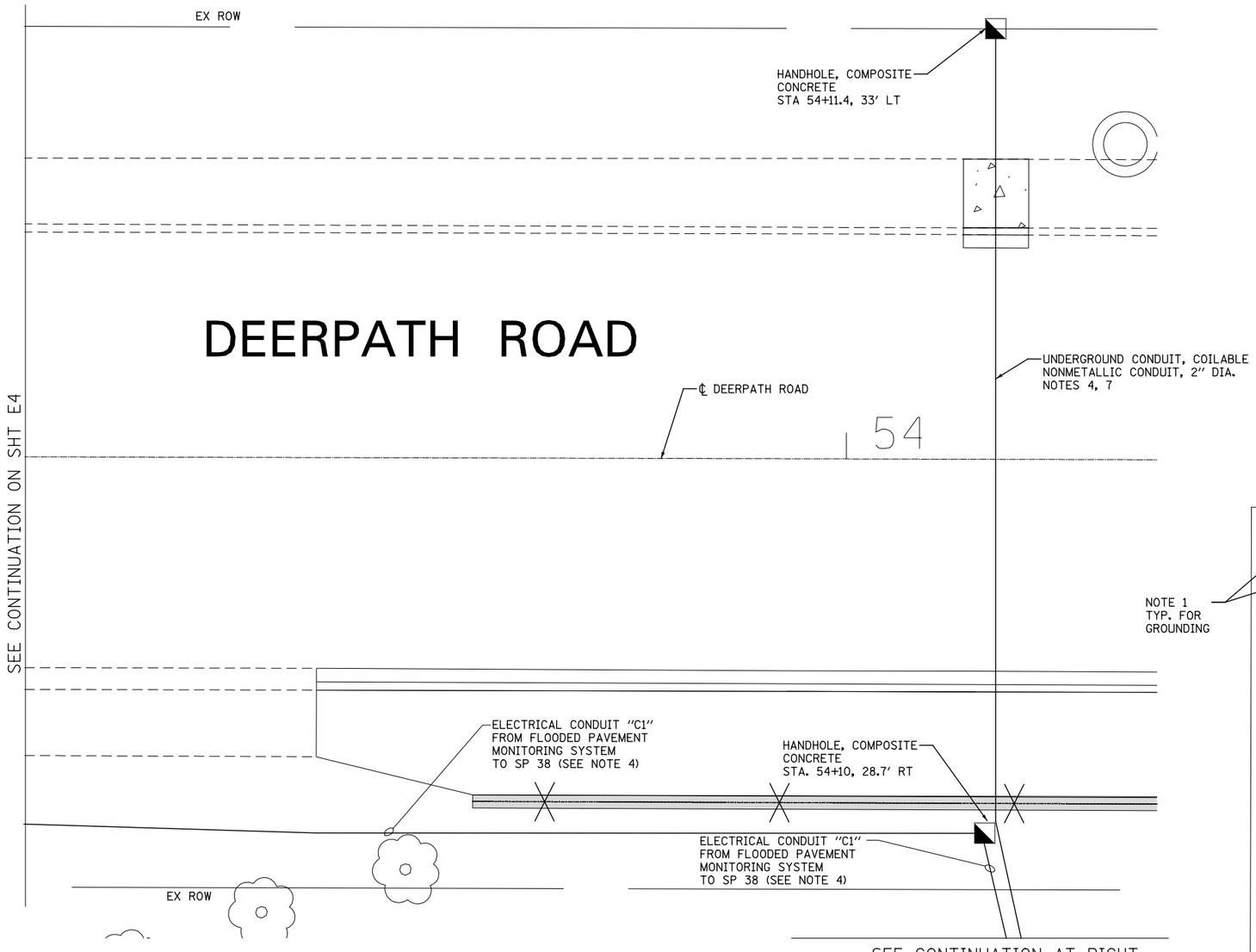
USER NAME = cliss	DESIGNED PNS	REVISED -
	DRAWN MB	REVISED -
PLOT SCALE = 1:10	CHECKED JWM	REVISED -
PLOT DATE = 6/25/2020	DATE 06/26/20	REVISED -

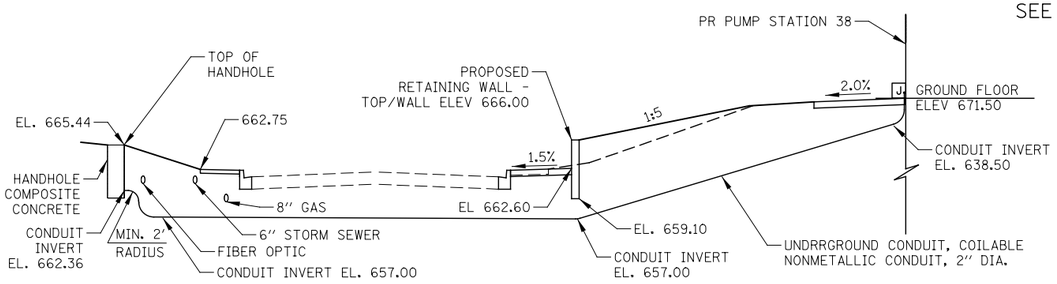
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ELECTRICAL GROUNDING AND UNDERGROUND UTILITIES PLAN
PUMP STATION 38

SCALE: | SHEET 1 OF 3 SHEETS | STA. | TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	239
		CONTRACT NO. 62B65		
	ILLINOIS	FED. AID PROJECT		

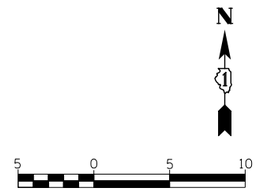


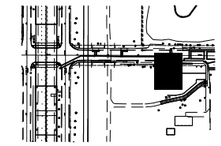


2" CNC CONDUIT PROFILE
NO SCALE

NOTES:

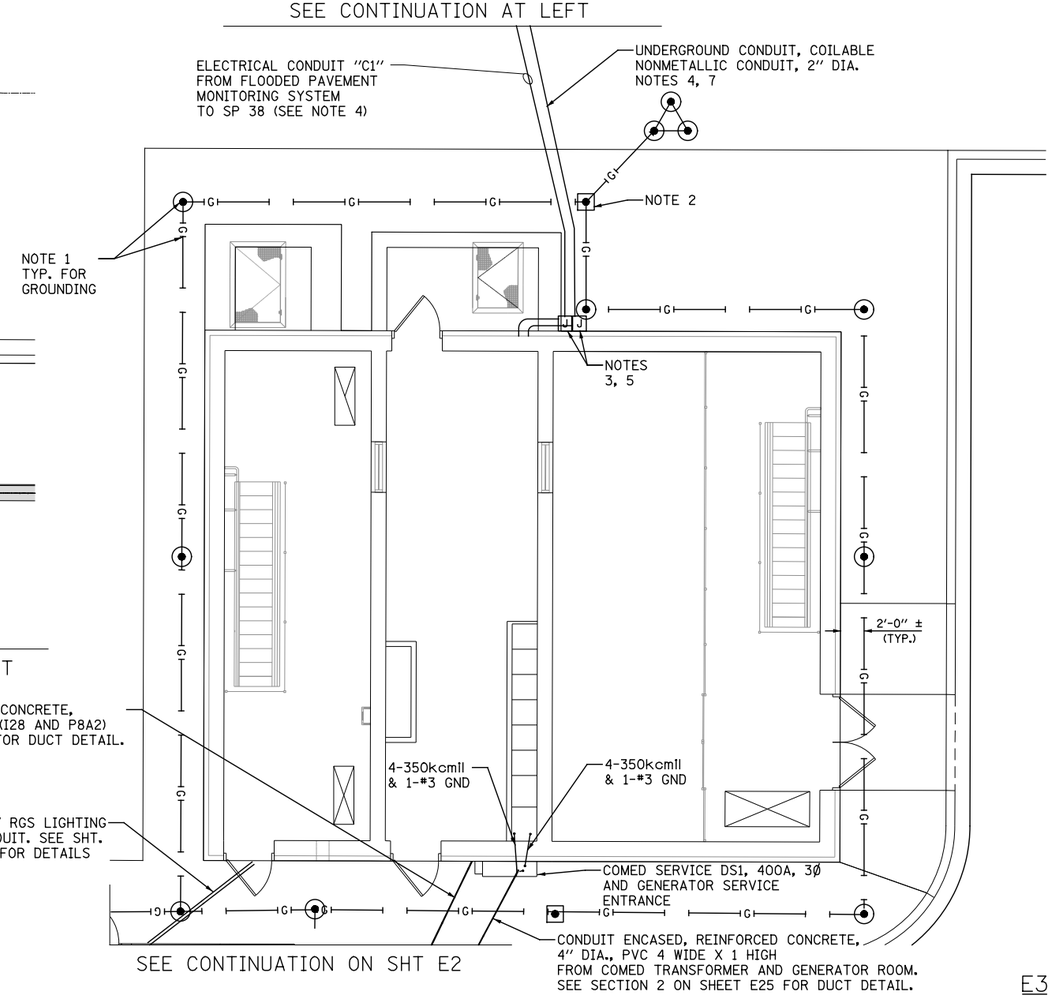
1. SEE SHEETS E25 AND E26 FOR GROUNDING DETAILS.
2. TEST WELL (ACCESS BOX). SEE DETAIL ON SHEET E25.
3. STUB UP CNC CONDUITS INTO JB'S AND CONTINUE CONDUITS THROUGH THE WALL AT ELEVATION 672.00 WITH PVC COATED RGS INSIDE BUILDING. SEE SHEET E5 FOR CONTINUATION.
4. CONDUIT OUTSIDE BUILDING AND/OR WIRING SHALL NOT BE INCLUDED IN "PUMP STATION ELECTRICAL WORK" PAY ITEM, BUT SHALL BE PAID FOR SEPARATELY.
5. JUNCTION BOX, STAINLESS STEEL, ATTACHED TO STRUCTURE, 12" X 6" X 4" SHALL BE INCLUDED IN THE "PUMP STATION ELECTRICAL WORK" PAY ITEM. JUNCTION BOXES SHALL BE INSTALLED SO THAT THE CONDUITS OVERLAPPING WILL BE AVOIDED.
6. SEE SHEET E28 FOR CONDUIT AND CABLE SCHEDULE.
7. CONDUIT FOR CITY OF LAKE FOREST FUTURE USE.





KEY MAP

SEE CONTINUATION AT LEFT



SEE CONTINUATION ON SHT E2

E3

FILE NAME = L:\7355\CAD\Sheets\Building\Electrical\Pump Station 38 - Electrical Drawings\ELECTRICAL 3 SITE PLAN.dgn

KNIGHT
Engineers & Architects

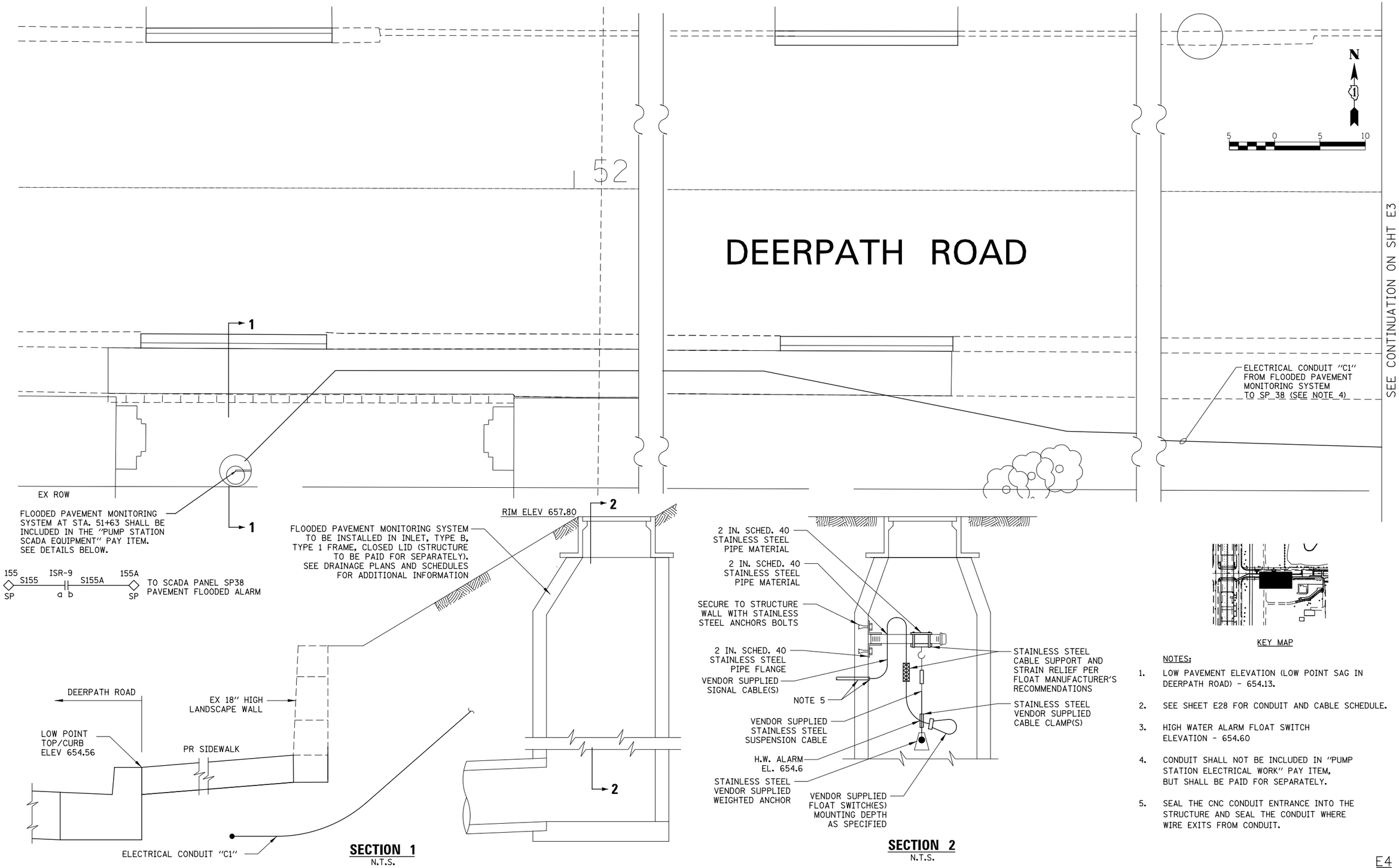
USER NAME = cliss	DESIGNED PNS	REVISED -
	DRAWN MB	REVISED -
PLOT SCALE = 1:9.99982	CHECKED JWM	REVISED -
PLOT DATE = 6/25/2020	DATE 06/26/20	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ELECTRICAL GROUNDING AND UNDERGROUND UTILITIES PLAN
PUMP STATION 38

SCALE: | SHEET 2 OF 3 SHEETS | STA. | TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	240
		CONTRACT NO. 62B65		
	ILLINOIS FED. AID PROJECT			



SECTION 1
N.T.S.

SECTION 2
N.T.S.

NOTES:

1. LOW PAVEMENT ELEVATION (LOW POINT SAG IN DEERPATH ROAD) - 654.13.
2. SEE SHEET E28 FOR CONDUIT AND CABLE SCHEDULE.
3. HIGH WATER ALARM FLOAT SWITCH ELEVATION - 654.60
4. CONDUIT SHALL NOT BE INCLUDED IN "PUMP STATION ELECTRICAL WORK" PAY ITEM, BUT SHALL BE PAID FOR SEPARATELY.
5. SEAL THE CNC CONDUIT ENTRANCE INTO THE STRUCTURE AND SEAL THE CONDUIT WHERE WIRE EXITS FROM CONDUIT.

E4

FILE NAME = L:\7395\CADD\Sheets\Building\Electrical\Pump Station 38 - Electrical Drawings\ELECTRICAL 4 SITE PLAN.dgn

KNIGHT
Engineers & Architects

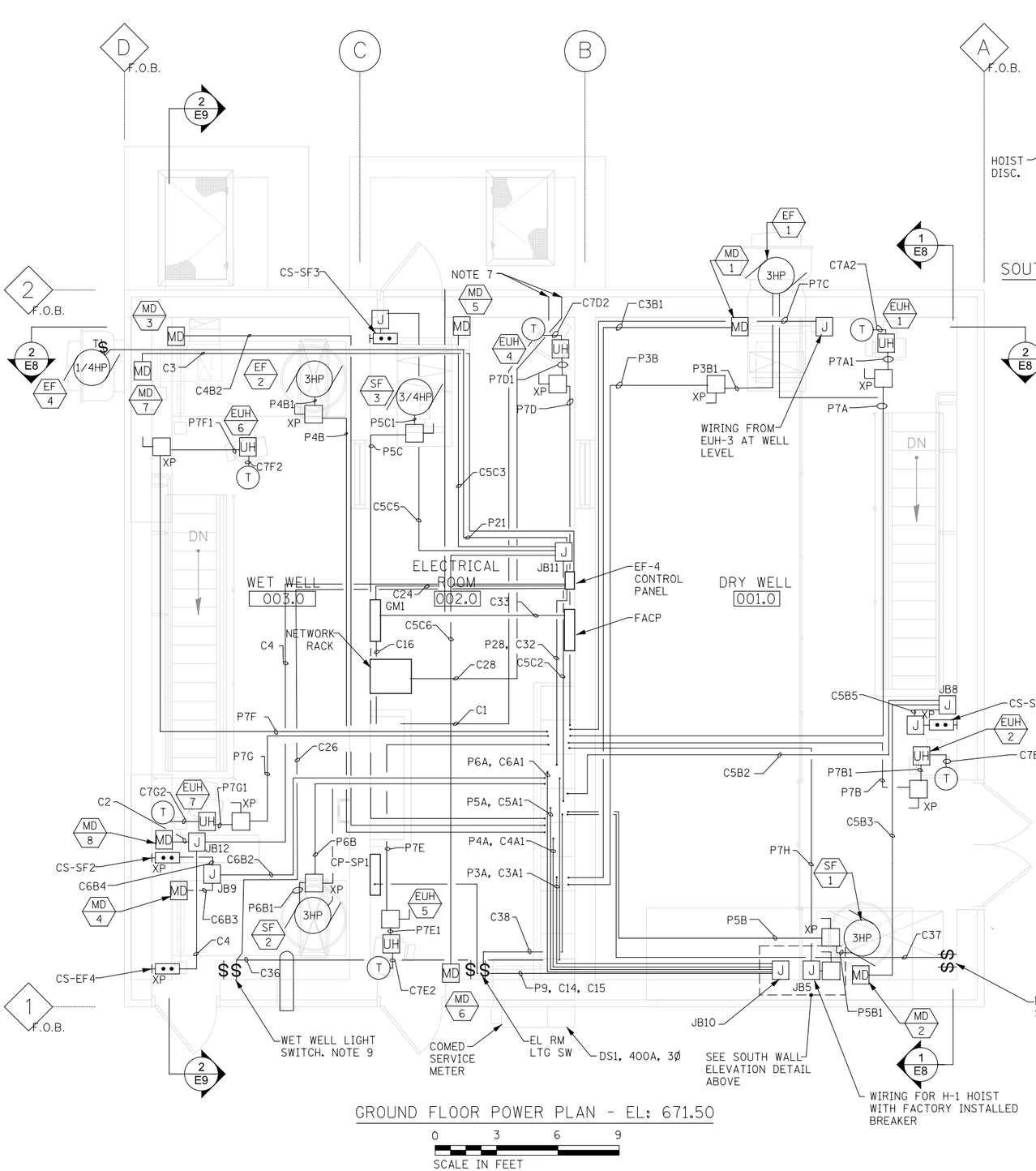
USER NAME = cliss	DESIGNED PNS	REVISED -
	DRAWN MB	REVISED -
PLOT SCALE = 1:10	CHECKED JWM	REVISED -
PLOT DATE = 6/25/2020	DATE 06/26/20	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ELECTRICAL GROUNDING AND UNDERGROUND UTILITIES PLAN
PUMP STATION 38

SCALE: | SHEET 3 OF 3 SHEETS | STA. | TO STA.

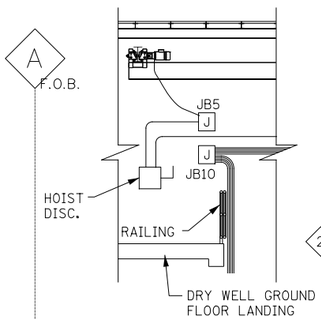
F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	241
		CONTRACT NO. 62B65		
	ILLINOIS	FED. AID PROJECT		



GROUND FLOOR POWER PLAN - EL: 671.50

0 3 6 9

SCALE IN FEET



SOUTH WALL ELEVATION DETAIL

NO SCALE

ROOF LIGHTNING PLAN

0 6 12 18

SCALE IN FEET

NOTES:

1. PROVIDE GRD LUGS IN GROUND WELL FOR TESTING. DO NOT CONNECT ENDS OF GRD LUG TO EACH OTHER.
2. PROVIDE #4/0 CU BARE GRD AND CONNECT TO MCC GROUND BUS.
3. INSTALL GROUND CABLE A MINIMUM OF 36" BELOW FINAL GRADE.
4. INSTALL AIR TERMINALS WITHIN 2'-0" OF ROOF EDGES AND AT INTERVALS NOT EXCEEDING 20'-0" ALONG RIDGES AND ALONG PERIMETER OF THE ROOF.
5. GROUND RODS INSTALLED PER DRAWINGS E2 AND E3 SHOWN HERE FOR CLARIFICATION ONLY.
6. SEE SHEET E25 AND E26 FOR GROUNDING DETAILS.
7. SEE SHEET E3 FOR CONTINUATION. OVERHEAD RGS CONDUIT AND/OR WIRING SHALL BE INCLUDED IN "PUMP STATION ELECTRICAL WORK" PAY ITEM.
8. SEE SHEET E28 FOR CONDUIT AND CABLE SCHEDULE.
9. SEE INTERIOR LIGHTING SCHEMATIC DIAGRAM AND NOTE 5 ON SHEET E10.
10. SEE ONE LINE DIAGRAM ON SHEET E17 AND PANEL SCHEDULES ON SHEET E27 FOR DISCONNECT SIZES AND CIRCUITING.
11. ALL HVAC DUCTING SHALL BE BONDED IN ACCORDANCE WITH NEC ARTICLE 250.104 INFORMATIONAL NOTE 1.
12. SEE STRUCTURAL PLANS FOR CONCRETE PAD DETAILS.
13. SEE SHEET E15 FOR ELECTRICAL ROOM EQUIPMENT.

FILE NAME = L:\7355\CAD\Sheets\Building\Electrical\Pump Station 38 - Electrical Drawings\ELECTRICAL 5 POWER PLANS 1.dgn

KNIGHT
Engineers & Architects

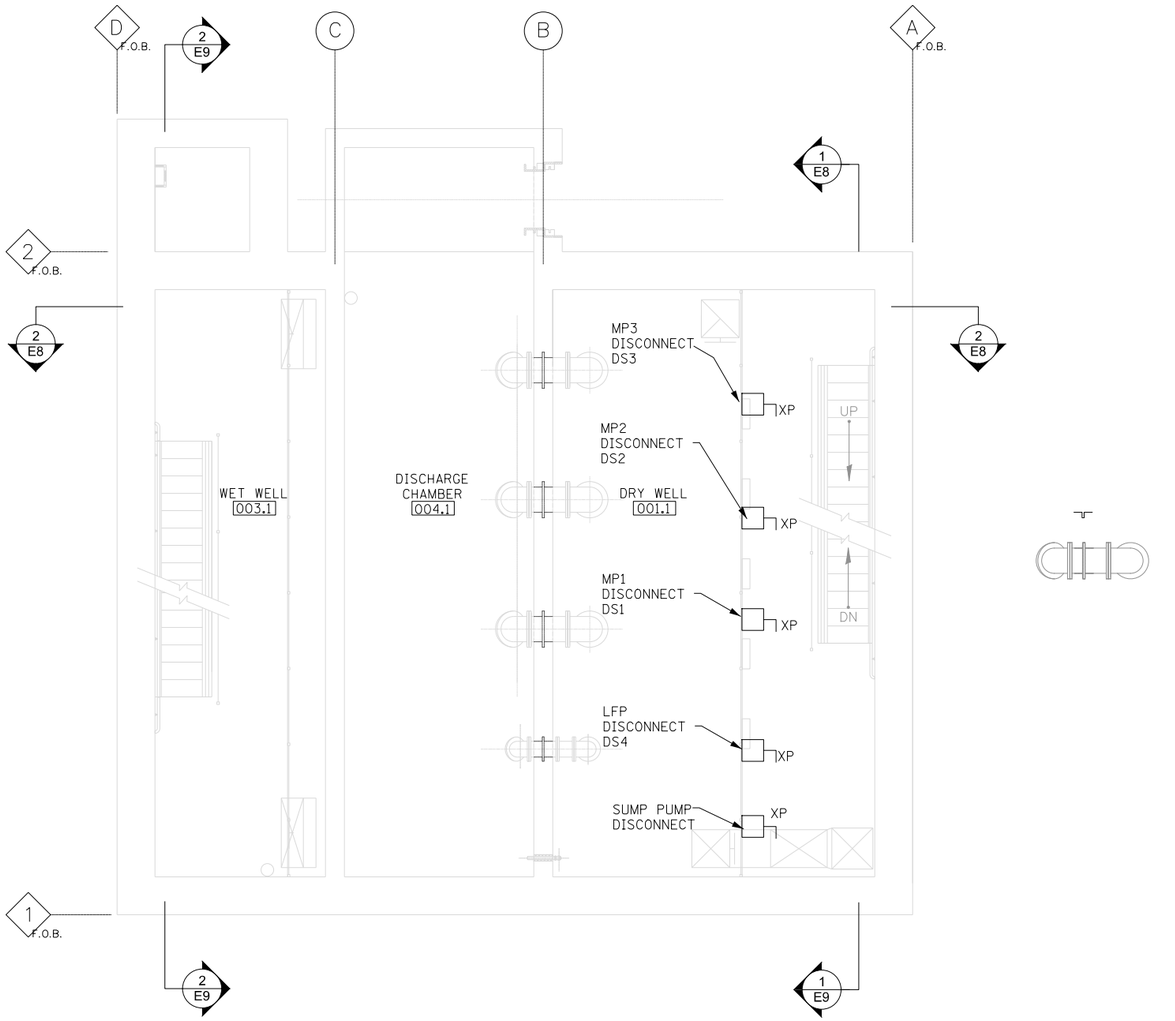
USER NAME = cliss	DESIGNED PNS	REVISED -
	DRAWN MB	REVISED -
PLOT SCALE = 1:24	CHECKED JWM	REVISED -
PLOT DATE = 6/25/2020	DATE 06/26/20	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

GROUND FLOOR POWER PLAN AND ROOF LIGHTNING PLAN
PUMP STATION 38

SCALE: | SHEET 1 OF 3 SHEETS | STA. | TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	242
		CONTRACT NO. 62B65		
	ILLINOIS FED. AID PROJECT			



INTERMEDIATE LEVEL PLAN-1 - EL: 661.58

SCALE: 1/4" = 1'-0"

NOTES:

1. FOR DS1, DS2, DS3 AND DS4 WIRING, SEE DETAIL ON SHEET E16.
2. SEE SHEET E28 FOR CONDUIT AND CABLE SCHEDULE.
3. SEE ONE LINE DIAGRAM ON SHEET E17 AND PANEL SCHEDULES ON SHEET E27 FOR DISCONNECT SIZES AND CIRCUITING.
4. PUMP DISCONNECT SHALL BE INSTALLED ON 2 UNISTRUTS. UNISTRUTS SHALL BE RIGID INSTALLED TO THE RAILING. DISCONNECT ENCLOSURE SHALL MEET THE REQUIREMENTS OF N.E.C. DIVISION 1, CLASS 2, GROUP D AFTER INSTALLATION.
5. ALL HVAC DUCTING SHALL BE BONDED IN ACCORDANCE WITH NEC ARTICLE 250.104 INFORMATIONAL NOTE 1.

0 4 8 12

SCALE IN FEET

E6

FILE NAME = L:\7395\CADD\Sheets\Building\Electrical\Pump Station 38 - Electrical Drawings\ELECTRICAL & POWER PLANS 2.dgn

KNIGHT Engineers & Architects

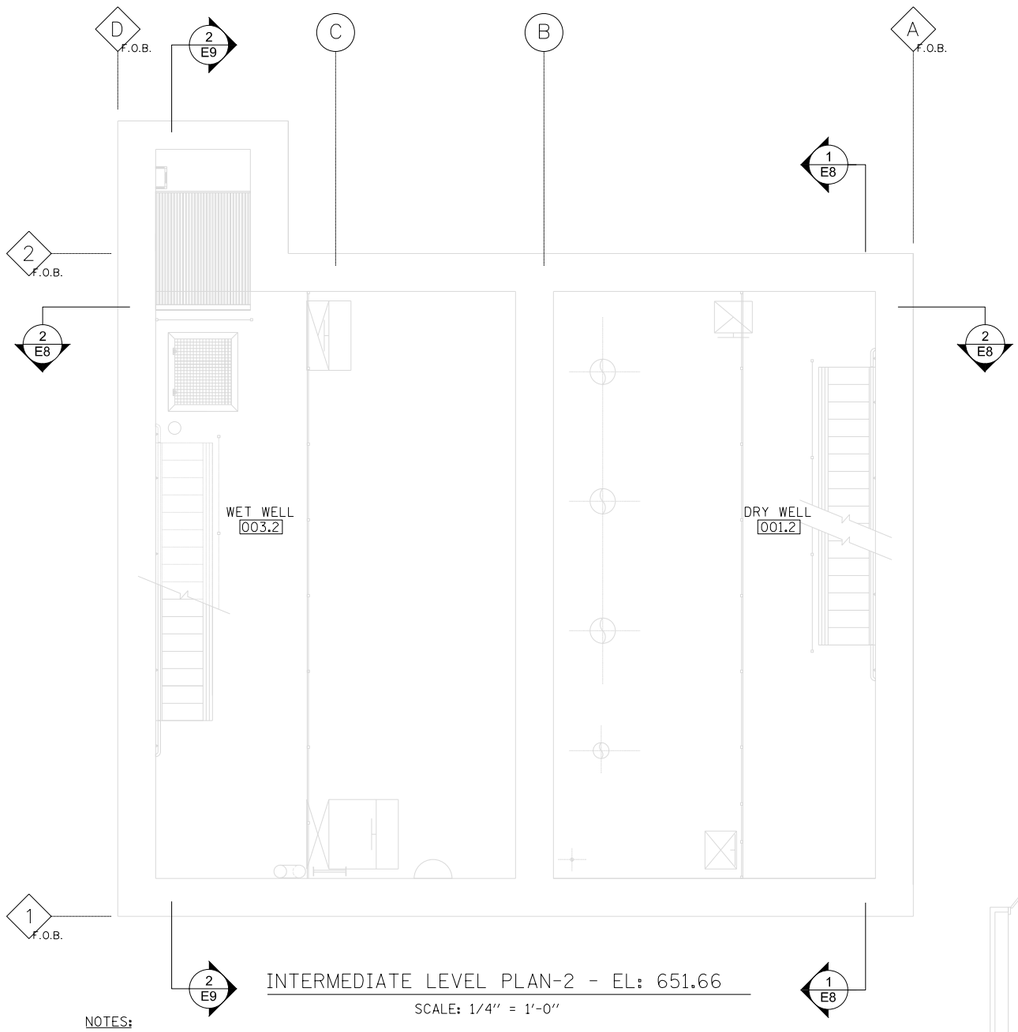
USER NAME = cliss	DESIGNED PNS	REVISED -
	DRAWN MB	REVISED -
PLOT SCALE = 1:32	CHECKED JWM	REVISED -
PLOT DATE = 6/25/2020	DATE 06/26/20	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

PUMP STATION POWER PLANS
PUMP STATION 38

SCALE: | SHEET 2 OF 3 SHEETS | STA. | TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	243
		CONTRACT NO. 62B65		
	ILLINOIS	FED. AID PROJECT		

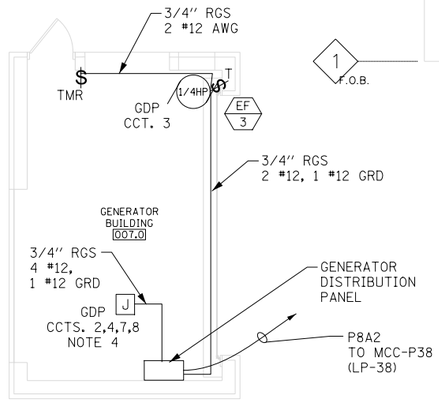


INTERMEDIATE LEVEL PLAN-2 - EL: 651.66

SCALE: 1/4" = 1'-0"

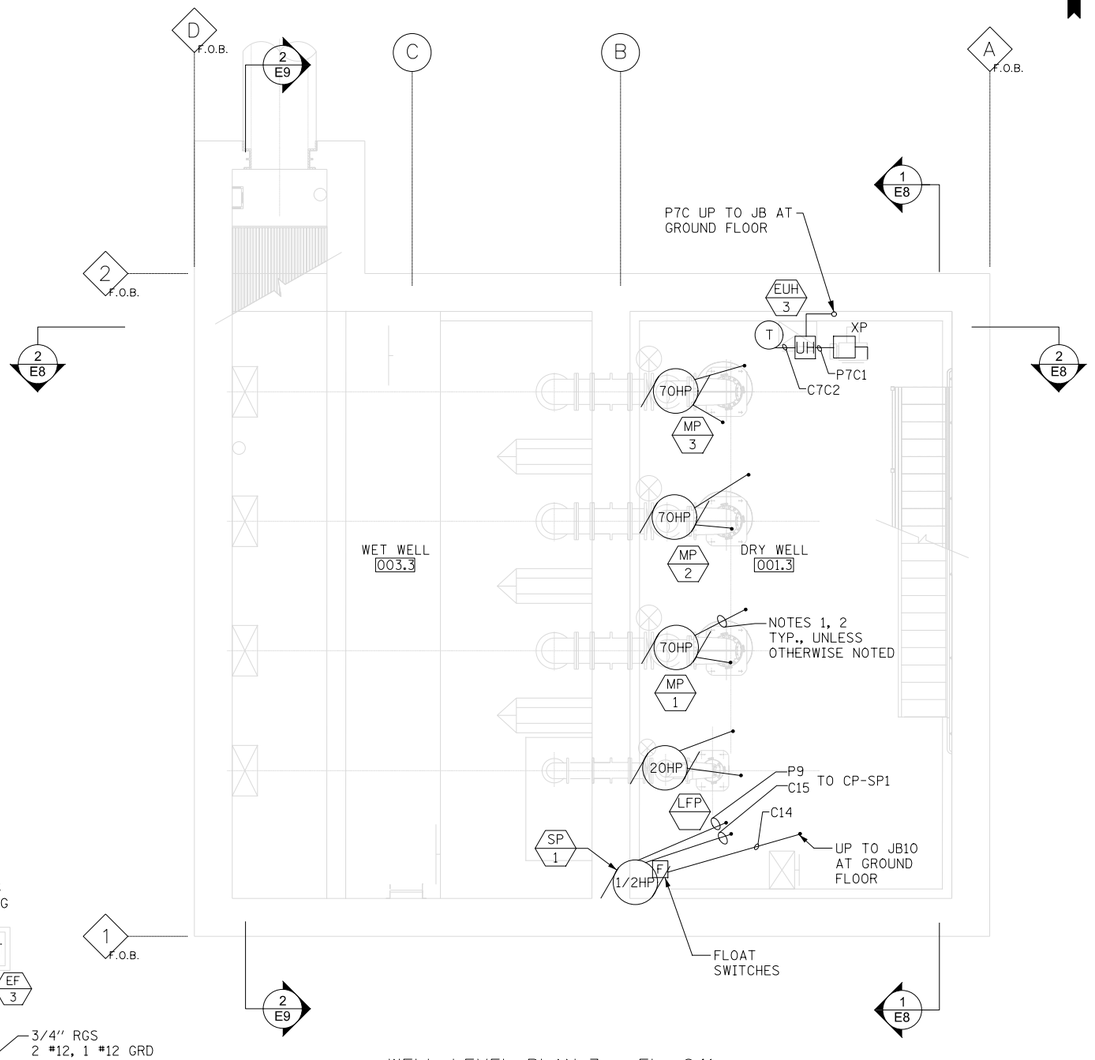
NOTES:

1. CABLES BY PUMP MANUFACTURER UP TO DISCONNECTS AT INTERMEDIATE FLOOR (-1) - EL: 661+58.
2. FOR DETAILS OF CONDUIT AND CABLE RUNS FROM MCC TO MP-1, MP-2, MP-3, LFP AND SP-1, SEE SHEET E8.
3. ELECTRICAL INSTALLATION AND EQUIPMENT WITHIN ENTIRE WET AND DRY WELL AREA SHALL BE PER N.E.C., CLASS I DIV. 2 GROUP D.
4. PROVIDE #12 AWG WIRING FOR BATTERY CHARGER, BLOCK HEATER AND OIL SUMP HEATER (ALL BY GENERATOR MANUFACTURER). SEE GDP-38 PANEL SCHEDULE FOR CIRCUITING.
5. SEE SHEET E28 FOR CONDUIT AND CABLE SCHEDULE.
6. SEE ONE LINE DIAGRAM ON SHEET E17 AND PANEL SCHEDULES ON SHEET E27 FOR DISCONNECT SIZES AND CIRCUITING.
7. ALL HVAC DUCTING SHALL BE BONDED IN ACCORDANCE WITH NEC ARTICLE 250.104 INFORMATIONAL NOTE 1.



GENERATOR BUILDING PLAN

SCALE: 1/4" = 1'-0"



WELL LEVEL PLAN-3 - EL: 641

SCALE: 1/4" = 1'-0"

0 4 8 12

SCALE IN FEET

E7

FILE NAME = L:\7355\CAD\Sheets\Building\Electrical\Pump Station 38 - Electrical Drawings\ELECTRICAL 7 POWER PLANS 3.dgn

KNIGHT
Engineers & Architects

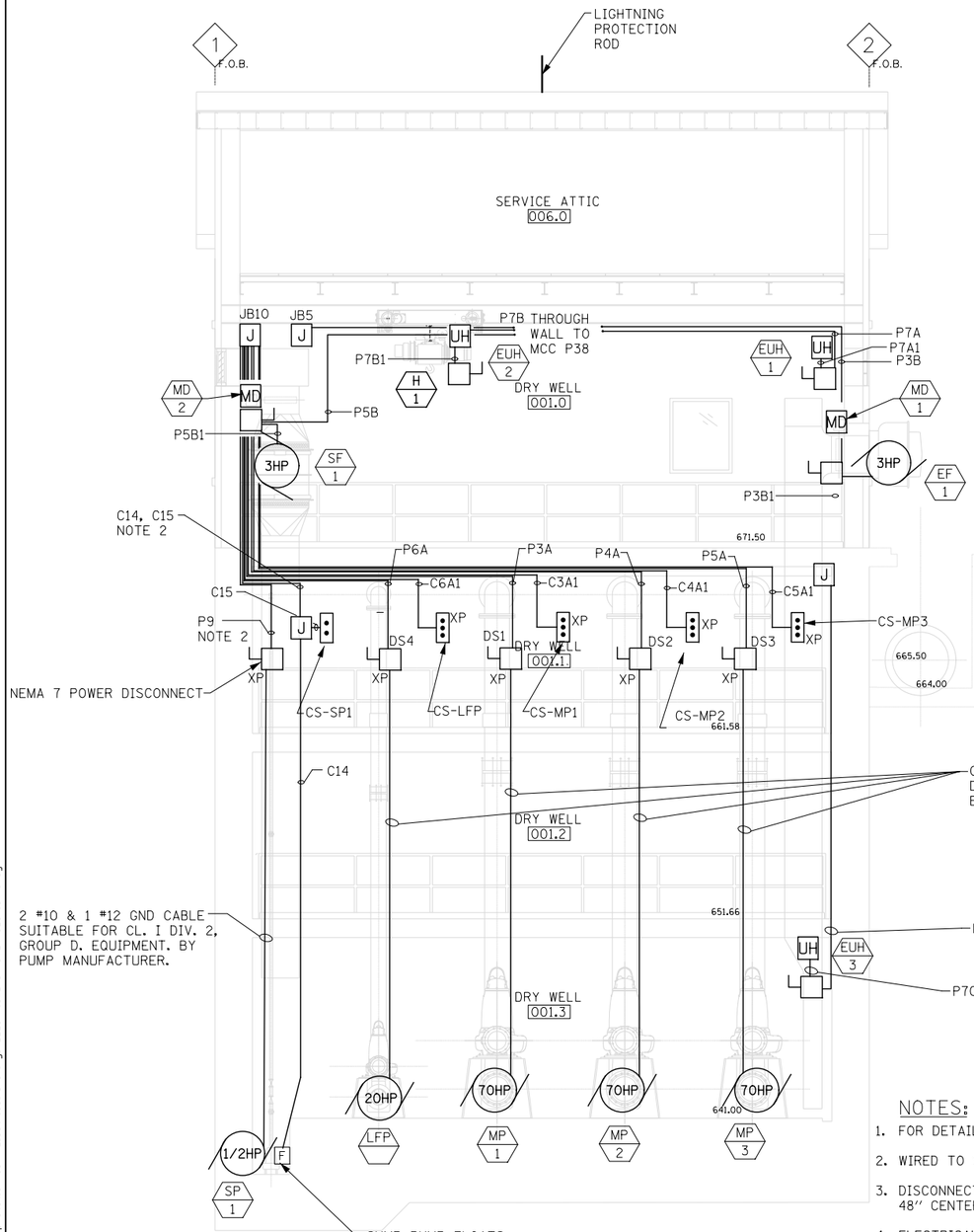
USER NAME = cliss	DESIGNED PNS	REVISED -
	DRAWN MB	REVISED -
PLOT SCALE = 1:32	CHECKED JWM	REVISED -
PLOT DATE = 6/25/2020	DATE 06/26/20	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

PUMP STATION AND GENERATOR BUILDING POWER PLANS
PUMP STATION 38

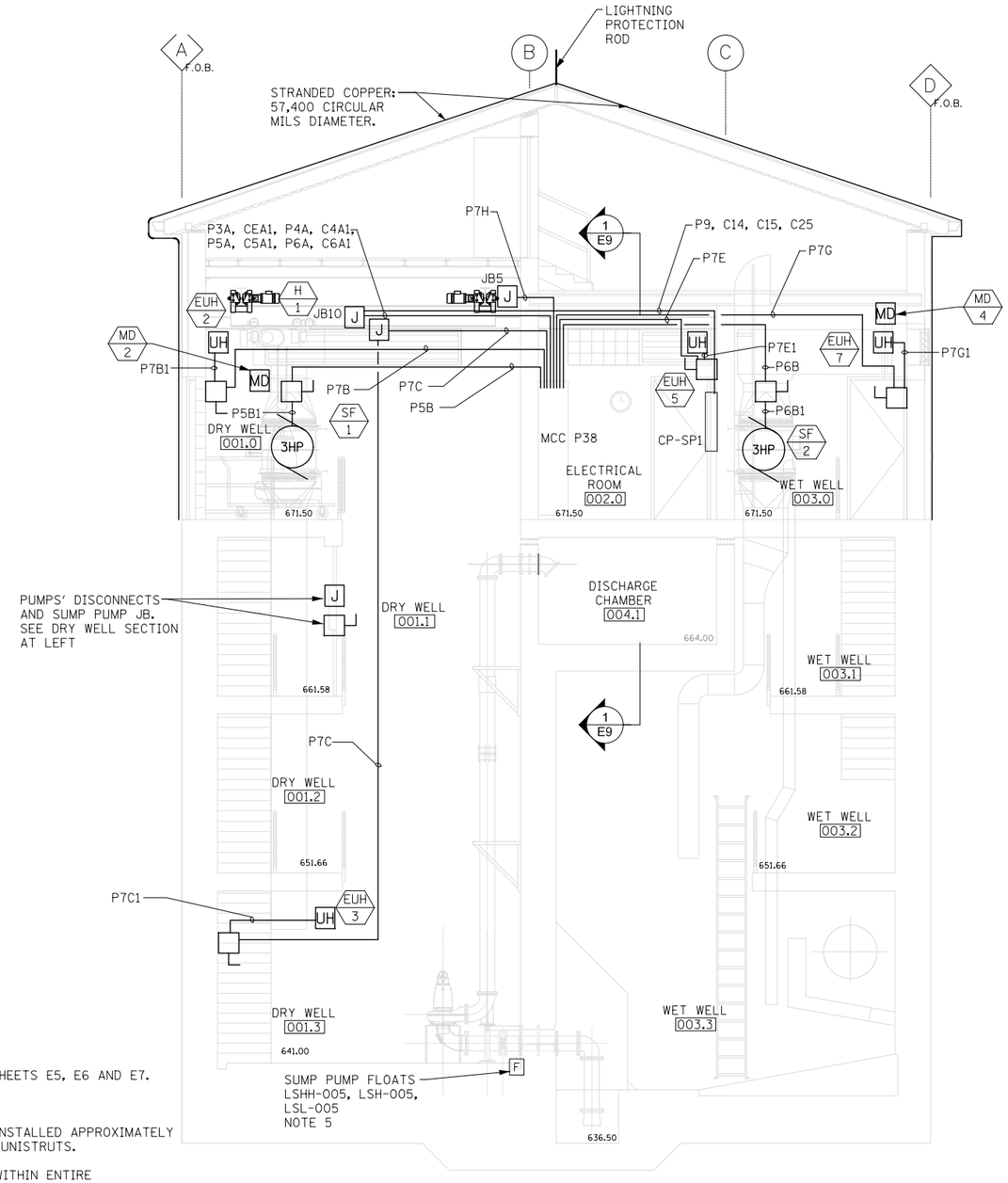
SCALE: | SHEET 3 OF 3 SHEETS | STA. | TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	244
		CONTRACT NO. 62B65		
	ILLINOIS FED. AID PROJECT			



1 DRY WELL SECTION

SCALE: 1/4" = 1'-0"



2 PUMP STATION SECTION ELEVATION
LOOKING SOUTH

SCALE: 1/4" = 1'-0"

0 4 8 12

SCALE IN FEET

NOTES:

1. FOR DETAILED WIRING/CONDUIT RUNS, SEE SHEETS E5, E6 AND E7.
2. WIRED TO SUMP PUMP CONTROL PANEL.
3. DISCONNECT AND PUSH BUTTONS SHALL BE INSTALLED APPROXIMATELY 48" CENTERLINE ABOVE FINISHED FLOOR ON UNISTRUTS.
4. ELECTRICAL INSTALLATION AND EQUIPMENT WITHIN ENTIRE WET AND DRY WELL AREA SHALL BE PER N.E.C. CLASS I DIV. 2, GROUP D.
5. LSHH = 640.50'
   LSH = 639.50'
   LSL = 638.50'
6. SEE SHEET E28 FOR CONDUIT AND CABLE SCHEDULE.
7. SEE ONE LINE DIAGRAM ON SHEET E17 AND PANEL SCHEDULES ON SHEET E27 FOR DISCONNECT SIZES AND CIRCUITING.
8. ALL HVAC DUCTING SHALL BE BONDED IN ACCORDANCE WITH NEC ARTICLE 250.104 INFORMATIONAL NOTE 1.

FILE NAME = L:\7395\CADD\Sheets\Building\Electrical\Pump Station 38 - Electrical Drawings\ELECTRICAL & POWER SECTION 1.dgn

KNIGHT
Engineers & Architects

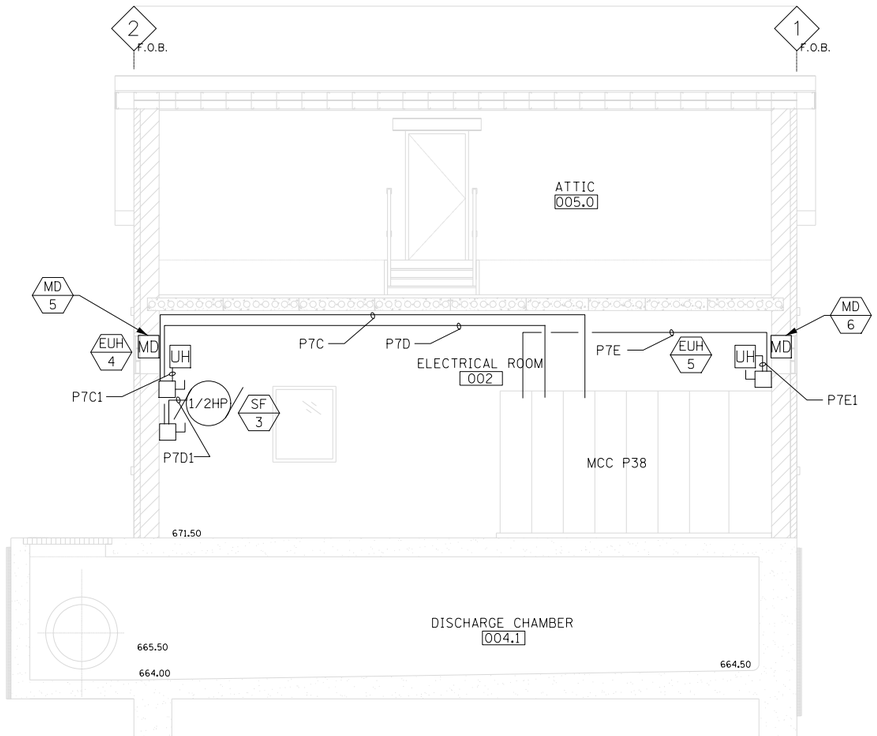
USER NAME = cliss	DESIGNED PNS	REVISED -
	DRAWN MB	REVISED -
PLOT SCALE = 1:32	CHECKED JWM	REVISED -
PLOT DATE = 6/25/2020	DATE 06/26/20	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

PUMP STATION POWER SECTION ELEVATIONS
PUMP STATION 38

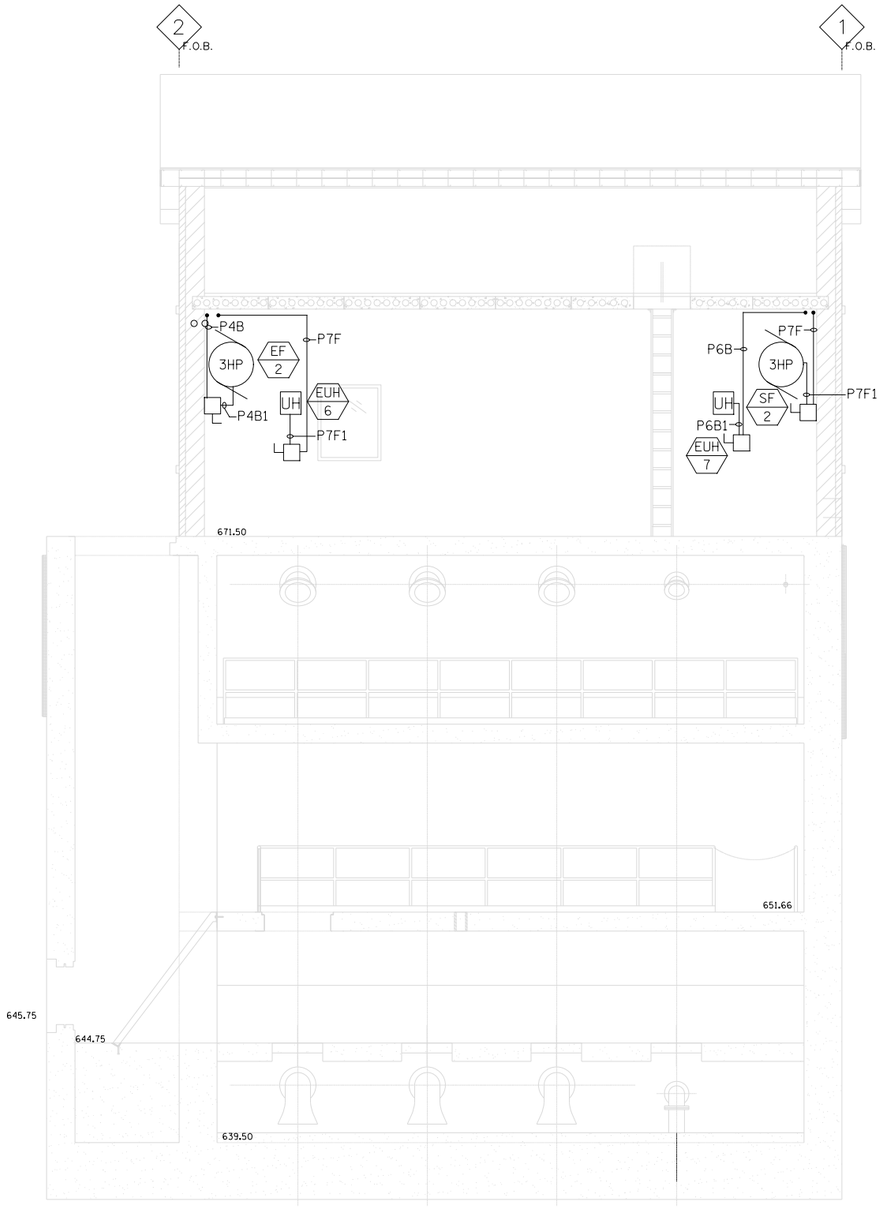
SCALE: | SHEET 1 OF 2 SHEETS | STA. | TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	245
		CONTRACT NO. 62B65		
		ILLINOIS	FED. AID PROJECT	



1 EL. ROOM AND DISTRIBUTION CHAMBER SECTION ELEVATION LOOKING EAST

SCALE: 1/4" = 1'-0"



2 WET WELL SECTION ELEVATION LOOKING EAST

SCALE: 1/4" = 1'-0"

0 4 8 12

SCALE IN FEET

NOTES:

1. SEE SHEET E28 FOR CONDUIT AND CABLE SCHEDULE.
2. SEE ONE LINE DIAGRAM ON SHEET E17 AND PANEL SCHEDULES ON SHEET E27 FOR DISCONNECT SIZES AND CIRCUITING.
3. ALL HVAC DUCTING SHALL BE BONDED IN ACCORDANCE WITH NEC ARTICLE 250.104 INFORMATIONAL NOTE 1.

FILE NAME = L:\7395\CADD\Sheets\Building\Electrical\Pump Station 38 - Electrical Drawings\ELECTRICAL 9 POWER SECTION 2 .dgn

KNIGHT Engineers & Architects

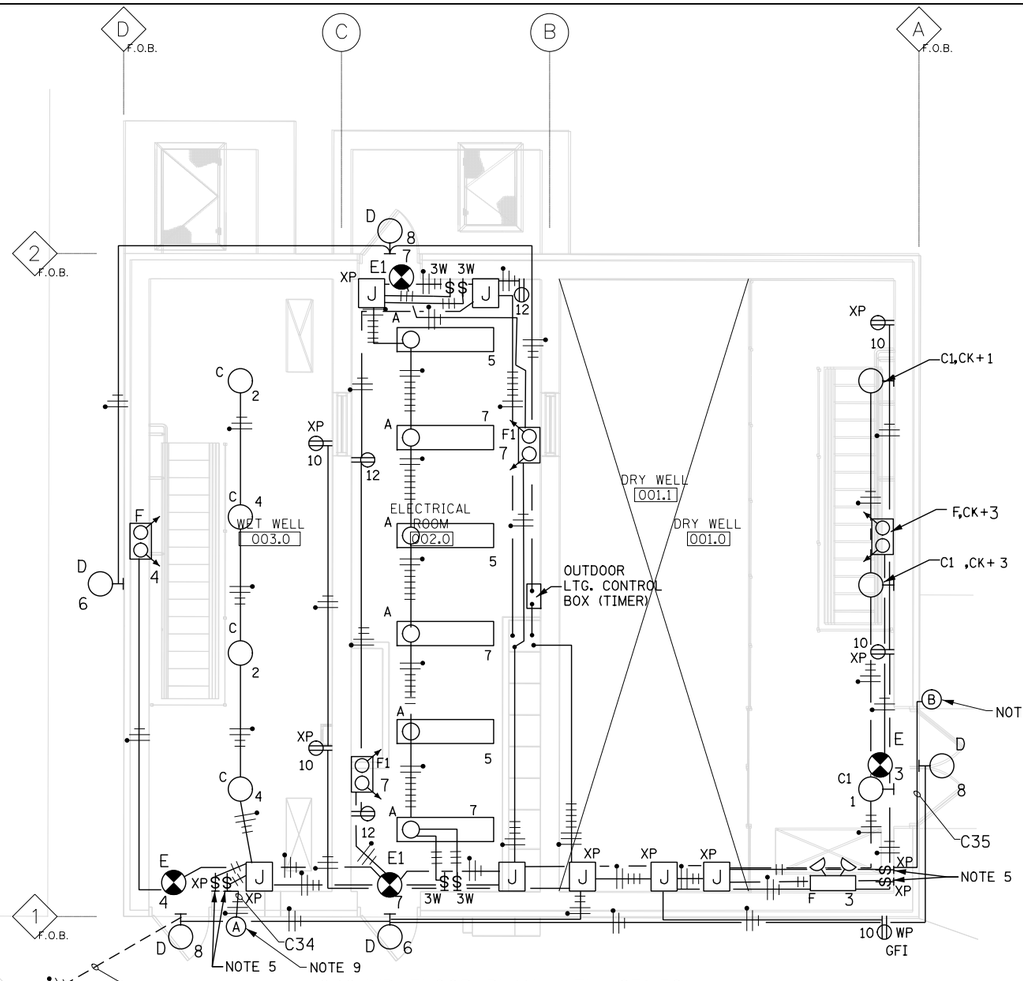
USER NAME = cliss	DESIGNED PNS	REVISED -
	DRAWN MB	REVISED -
PLOT SCALE = 1:32	CHECKED JWM	REVISED -
PLOT DATE = 6/25/2020	DATE 06/26/20	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

PUMP STATION POWER SECTION ELEVATIONS
PUMP STATION 38

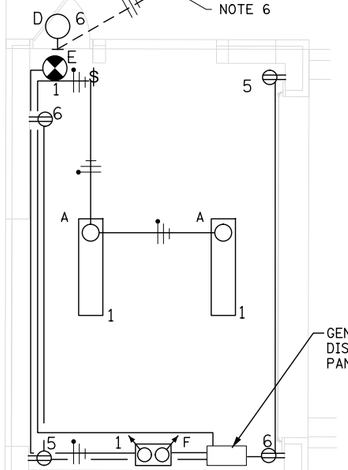
SCALE: | SHEET 2 OF 2 SHEETS | STA. | TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	246
		CONTRACT NO. 62B65		
	ILLINOIS	FED. AID PROJECT		



GROUND FLOOR PLAN - EL: 671.50

SCALE: 1/4" = 1'-0"

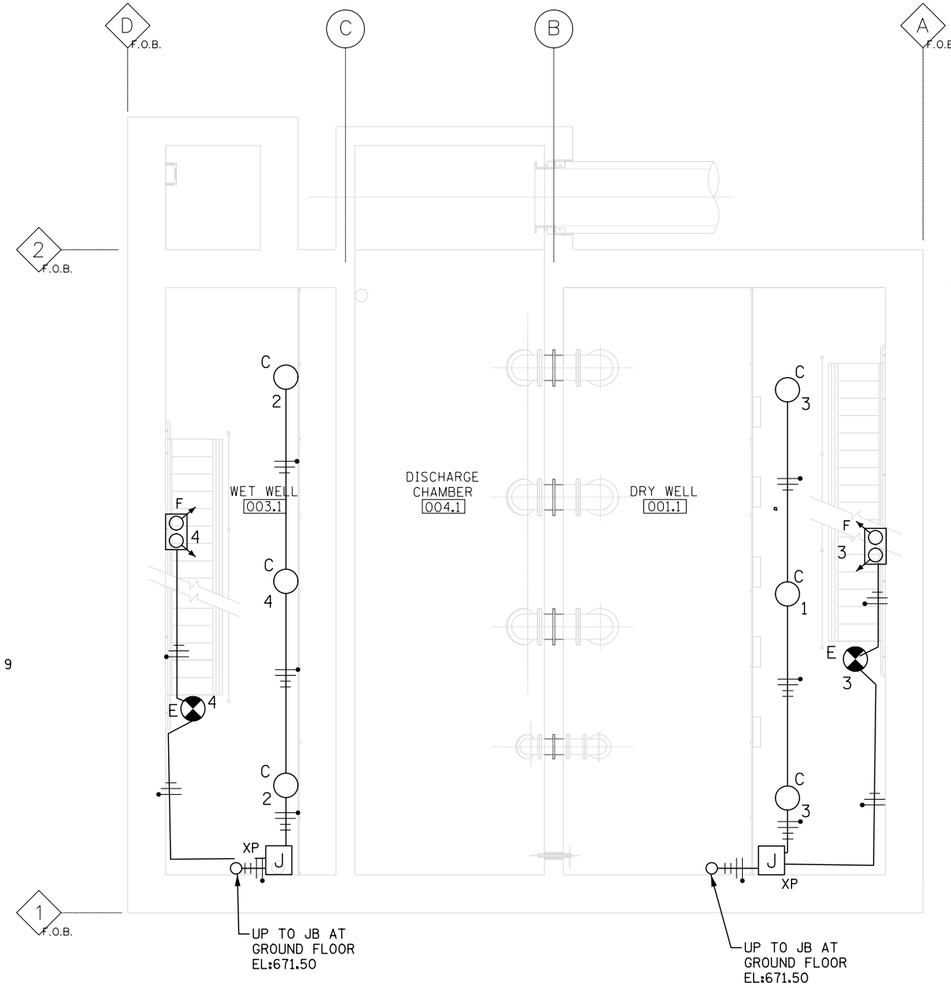


GENERATOR ROOM PLAN

SCALE: 1/4" = 1'-0"

NOTES:

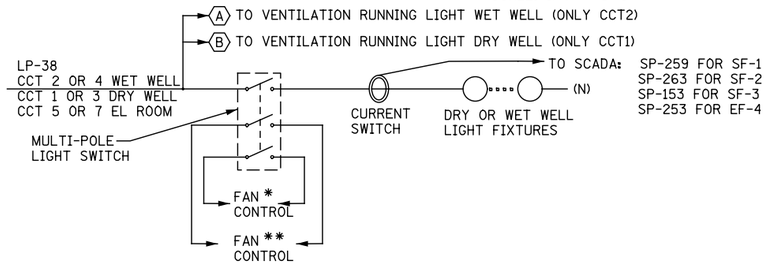
1. SEE SHEET E27 FOR FIXTURE SCHEDULE.
2. SEE SHEET E26 FOR LIGHTING DETAILS.
3. ALL WIRING IN GENERATOR ROOM SHALL BE 2 #12 & 1 #12 GRD. IN 3/4" RGS CONDUIT AND LIGHTING/RECEPTACLE SHALL BE WIRED TO GENERATOR DISTRIBUTION PANEL.
4. SEE SHEET E12 FOR ATTIC LIGHTING PLAN/WIRING.
5. WET WELL AND DRY WELL LIGHT SWITCHES ARE PROVIDED WITH CURRENT MONITOR INPUT FOR FAN CONTROLS THROUGH FAN CONTACTS.
6. RUN 3/4" PVC COATED RGS CONDUIT DOWN THE WALL INSIDE BUILDINGS AND 3/4" PVC COATED RGS CONDUIT UNDERGROUND BETWEEN BUILDINGS.
7. ALL OUTDOOR LIGHTS TO BE WIRED THROUGH LIGHTING CONTROL BOX (TIMER).
8. ALL CONDUITS IN DRY WELL, WET WELL AND OUTDOOR SHALL BE PVC COATED RGS TYPE.
9. FOR DETAILS SEE SHEET E26 AND FOR LOCATION OF VENTILATION RUNNING LIGHTS SEE ARCHITECTURAL EXTERIOR ELEVATIONS.
10. ADD AN ADDITIONAL EMERGENCY LIGHT PACK IN THE GENERATOR BUILDING. DIRECT THE LIGHTS TO THE GENERATOR CONTROL PANEL.
11. ALL LIGHTING CONDUITS SHALL BE 3/4", UNLESS OTHERWISE NOTED AND WIRING SHALL BE #12 AWG.
12. ALL LIGHTING AT PUMP STATION BUILDING SHALL BE WIRED TO PANEL LP-38.
13. EMERGENCY LIGHTS TO BE IN ACCORDANCE WITH NEC ART. 700.12(F)(2)(3).



INTERMEDIATE LEVEL PLAN-1 - EL: 661.58

DISCHARGE CHAMBER - EL: 664.00

SCALE: 1/4" = 1'-0"

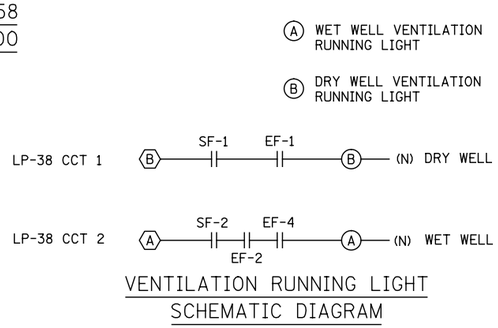


* SF-1 IN DRY WELL
SF-2 IN WET WELL
SF-3 IN EL ROOM

** EF-4 IN WET WELL
NOT REQUIRED IN DRY WELL
AND ELECTRICAL ROOM

SEE SHEETS E22 AND E23 FOR VENTILATION SCHEMATIC DETAILS

INTERIOR LIGHTING SCHEMATIC DIAGRAM



VENTILATION RUNNING LIGHT SCHEMATIC DIAGRAM

0 4 8 12

SCALE IN FEET

SP-287 D01-13 SP-287A 287 N4

SP-288 D01-14 SP-288A 288 N4

E10

FILE NAME = L:\7955\CAD\Sheets\Building\Electrical\Pump Station 38 - Electrical Drawings\ELECTRICAL 10 LIGHTING PLANS Sht 1.dgn

KNIGHT
Engineers & Architects

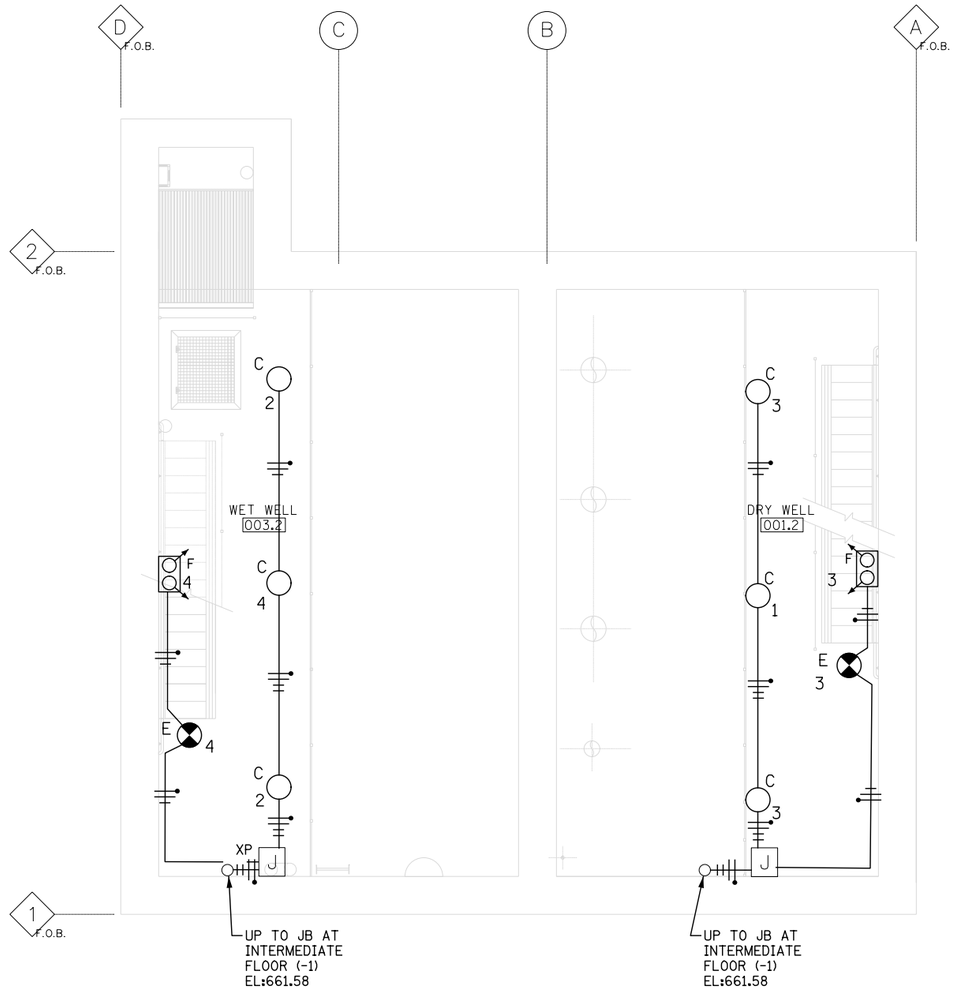
USER NAME = cliss	DESIGNED PNS	REVISED -
	DRAWN MB	REVISED -
PLOT SCALE = 1:32	CHECKED JWM	REVISED -
PLOT DATE = 6/25/2020	DATE 06/26/20	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

PUMP STATION LIGHTING AND RECEPTACLE PLAN
PUMP STATION 38

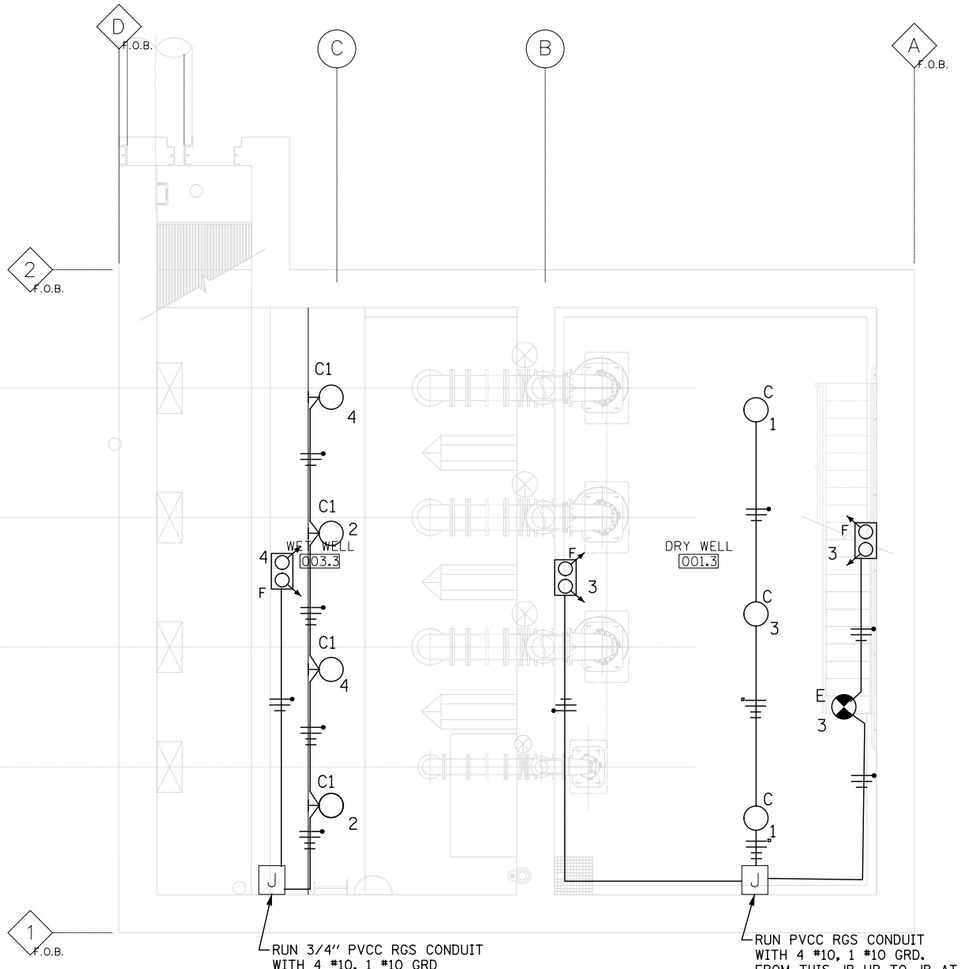
SCALE: | SHEET 1 OF 2 SHEETS | STA. | TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	247
		CONTRACT NO. 62B65		
	ILLINOIS	FED. AID PROJECT		



INTERMEDIATE LEVEL PLAN-2 - EL: 651.66

SCALE: 1/4" = 1'-0"



WELL LEVEL PLAN - EL: 641.00

SCALE: 1/4" = 1'-0"

NOTES:

1. SEE SHEET E27 FOR FIXTURE SCHEDULE.
2. SEE SHEET E26 FOR LIGHTING DETAILS.
3. LIGHT FIXTURES INSTALLED ON FOLDING-UP BRACKETS ON THE SIDE OF LANDING ABOVE.
4. SEE SHEET E12 FOR ATTIC LIGHTING PLAN/WIRING.
5. ALL CONDUITS IN DRY WELL AND WET WELL SHALL BE PVC COATED RGS TYPE.
6. ALL CONDUITS SHALL BE 3/4" PVCC RGS AND WIRING SHALL BE #12 AWG.
7. ALL LIGHTING AT PUMP STATION BUILDING SHALL BE WIRED TO PANEL LP-38.
8. EMERGENCY LIGHTS TO BE IN ACCORDANCE WITH NEC ART. 700.12(F)(2)(3).

0 4 8 12

SCALE IN FEET

E11

FILE NAME = L:\7355\CAD\Sheets\Building\Electrical\Pump Station 38 - Electrical Drawings\ELECTRICAL II LIGHTING PLANS Sht 2.dgn

KNIGHT
Engineers & Architects

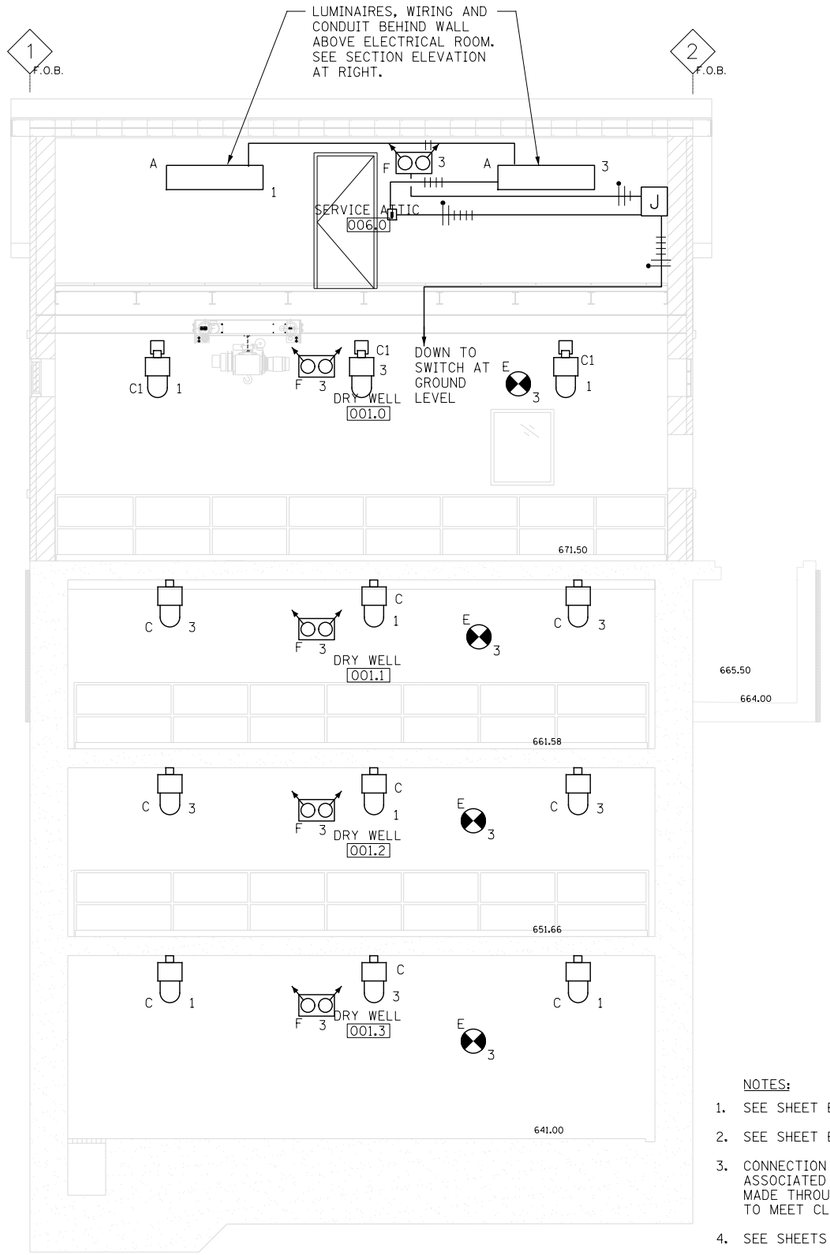
USER NAME = cliss	DESIGNED PNS	REVISED -
	DRAWN MB	REVISED -
PLOT SCALE = 1:32	CHECKED JWM	REVISED -
PLOT DATE = 6/25/2020	DATE 06/26/20	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

PUMP STATION LIGHTING AND RECEPTACLE PLAN
PUMP STATION 38

SCALE: | SHEET 2 OF 2 SHEETS | STA. | TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	248
		CONTRACT NO. 62B65		
	ILLINOIS FED. AID PROJECT			

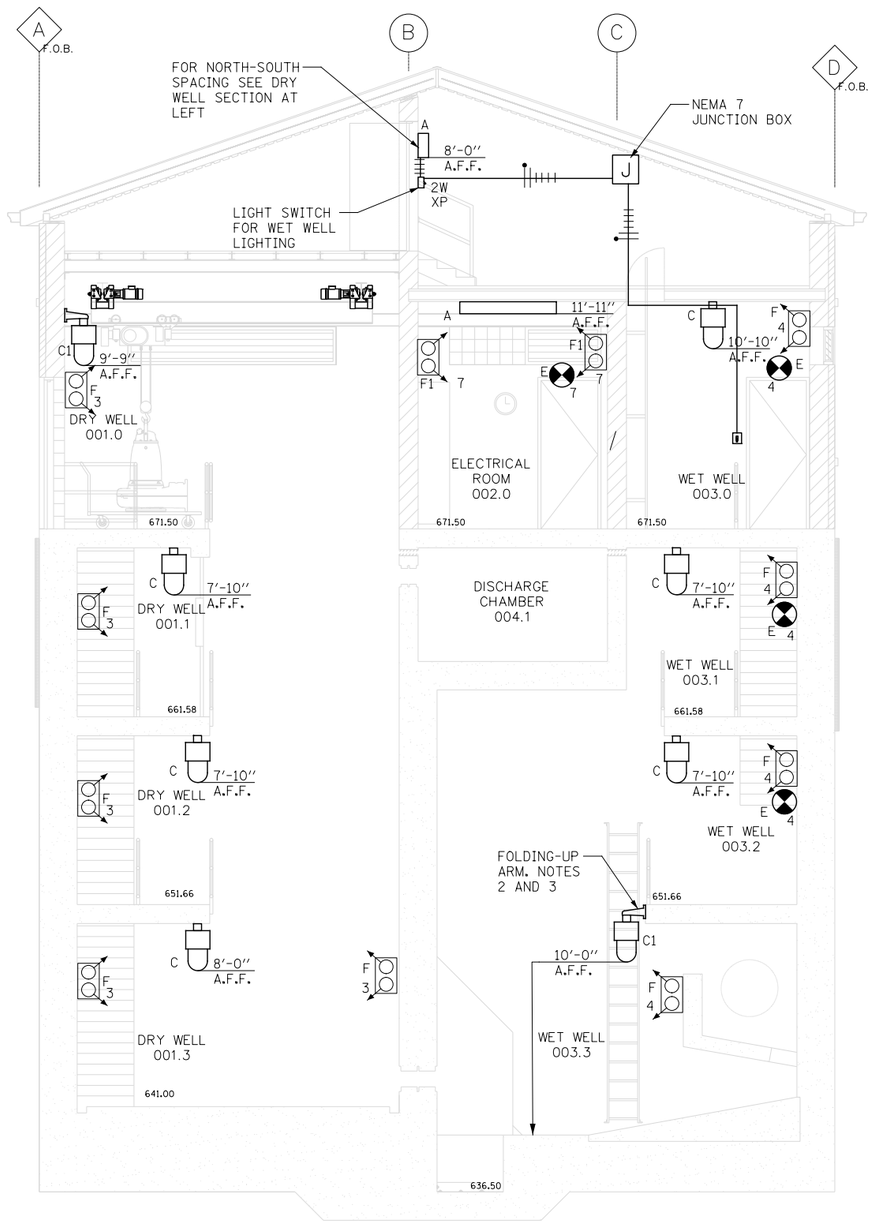


DRY WELL SECTION

SCALE: 1/4" = 1'-0"

NOTES:

1. SEE SHEET E27 FOR FIXTURE SCHEDULE.
2. SEE SHEET E26 FOR LIGHTING DETAILS.
3. CONNECTION BETWEEN LIGHT FIXTURE AND JUNCTION BOX ASSOCIATED ATTACHED TO LATERAL LANDING SHALL BE MADE THROUGH LIQUID TIGHT FLEXIBLE METALLIC CONDUIT TO MEET CLASS I DIV 2, GROUP D REQUIREMENTS.
4. SEE SHEETS E10 AND E11 FOR LEVEL LIGHTING PLANS/WIRING.
5. ALL CONDUITS IN DRY WELL AND, WET WELL SHALL BE PVC COATED RGS.
6. SEE SHEET E28 FOR CONDUIT AND CABLE SCHEDULE.
7. ALL LIGHTING AT PUMP STATION BUILDING SHALL BE WIRED TO PANEL LP-38.
8. EMERGENCY LIGHTS TO BE IN ACCORDANCE WITH NEC ART. 700.12(F)(2)(3).
9. ALL CONDUITS SHALL BE 3/4" AND WIRING SHALL BE #12 AWG.



PUMP STATION SECTION ELEVATION

LOOKING SOUTH

SCALE: 1/4" = 1'-0"

0 4 8 12

SCALE IN FEET

E12

FILE NAME = L:\7355\CAD\Sheets\Building\Electrical\Pump Station 38 - Electrical Drawings\ELECTRICAL 12 LIGHTING ELEVATIONS.dgn

KNIGHT Engineers & Architects

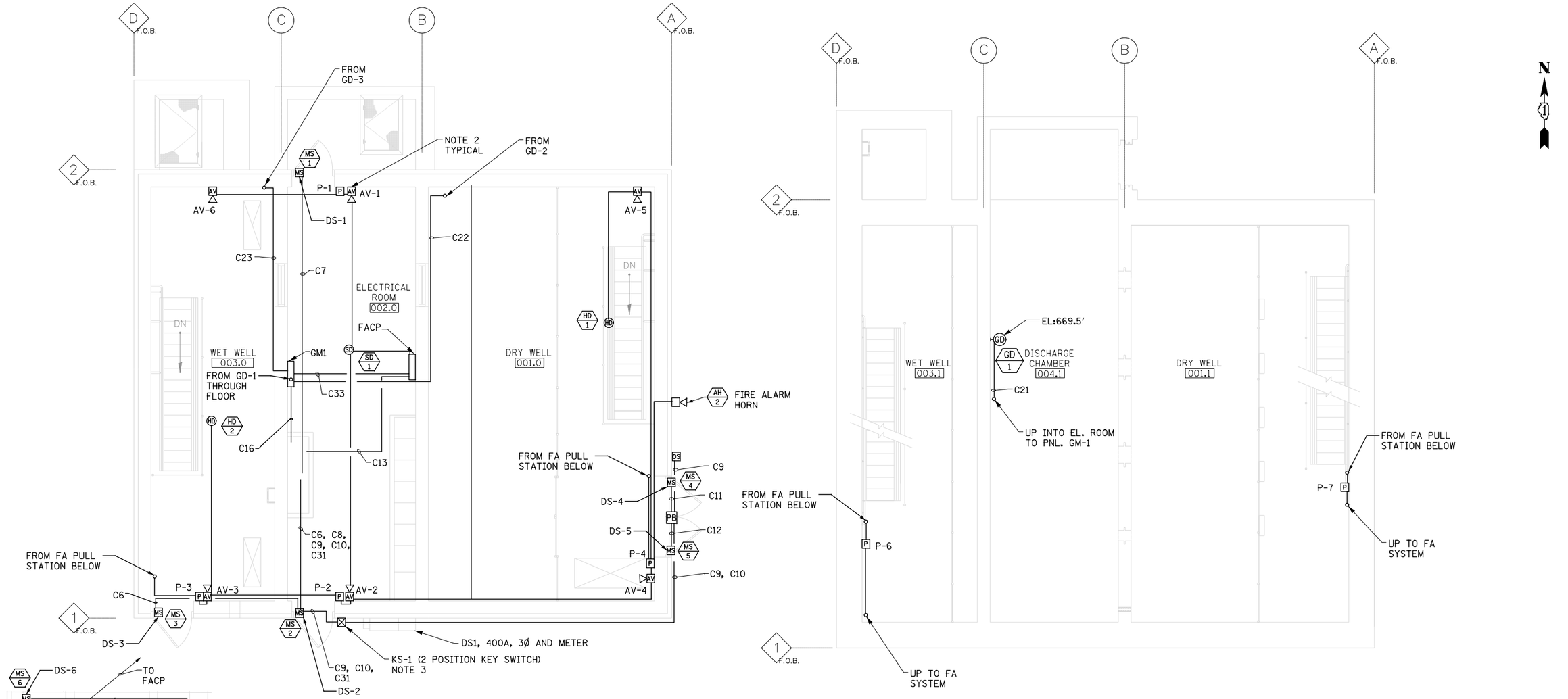
USER NAME = cliss	DESIGNED PNS	REVISED -
	DRAWN MB	REVISED -
PLOT SCALE = 1:32	CHECKED JWM	REVISED -
PLOT DATE = 6/25/2020	DATE 06/26/20	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

PUMP STATION LIGHTING ELEVATIONS
PUMP STATION 38

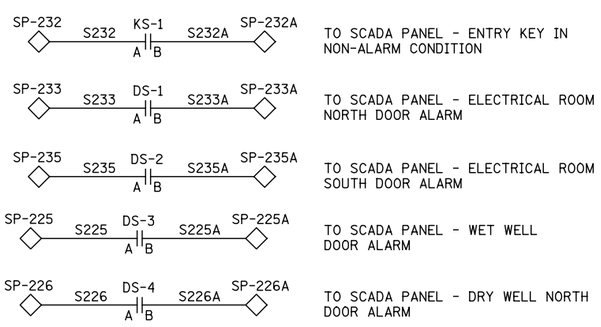
SCALE: | SHEET 1 OF 1 SHEETS | STA. | TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	249
		CONTRACT NO. 62B65		
	ILLINOIS	FED. AID PROJECT		



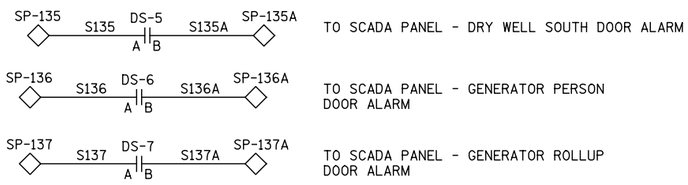
GROUND FLOOR PLAN - EL: 671.50

SCALE:: 1/4'' = 1'-0''



INTERMEDIATE LEVEL PLAN-1 - EL: 661.50

SCALE:: 1/4'' = 1'-0''



NOTES:

1. PUMP STATION HAS 4 FIRE ZONES:
   ZONE 1: WET WELL ROOM
   ZONE 2: ELECTRICAL ROOM
   ZONE 3: DRY WELL ROOM
   ZONE 4: GENERATOR ROOM
2. AUDIO ALARM HORN SHALL BE ADJUSTABLE LEVEL
3. ''UNOCCUPIED - OCCUPIED'' WEATHER PROOF KEY OPERATED SWITCH WITH LED. SEE SHEET E26 FOR DETAILS AND ARCHITECTURAL EXTERIOR ELEVATIONS FOR LOCATION.
4. SEE SHEET E28 FOR CONDUIT AND CABLE SCHEDULE.

0 4 8 12
SCALE IN FEET

E13

FILE NAME = L:\7355\CAD\Sheets\Building\Electrical\Pump Station 38 - Electrical Drawings\ELECTRICAL 13 FIRE & SECURITY PLANS SHT 1.dgn

KNIGHT Engineers & Architects

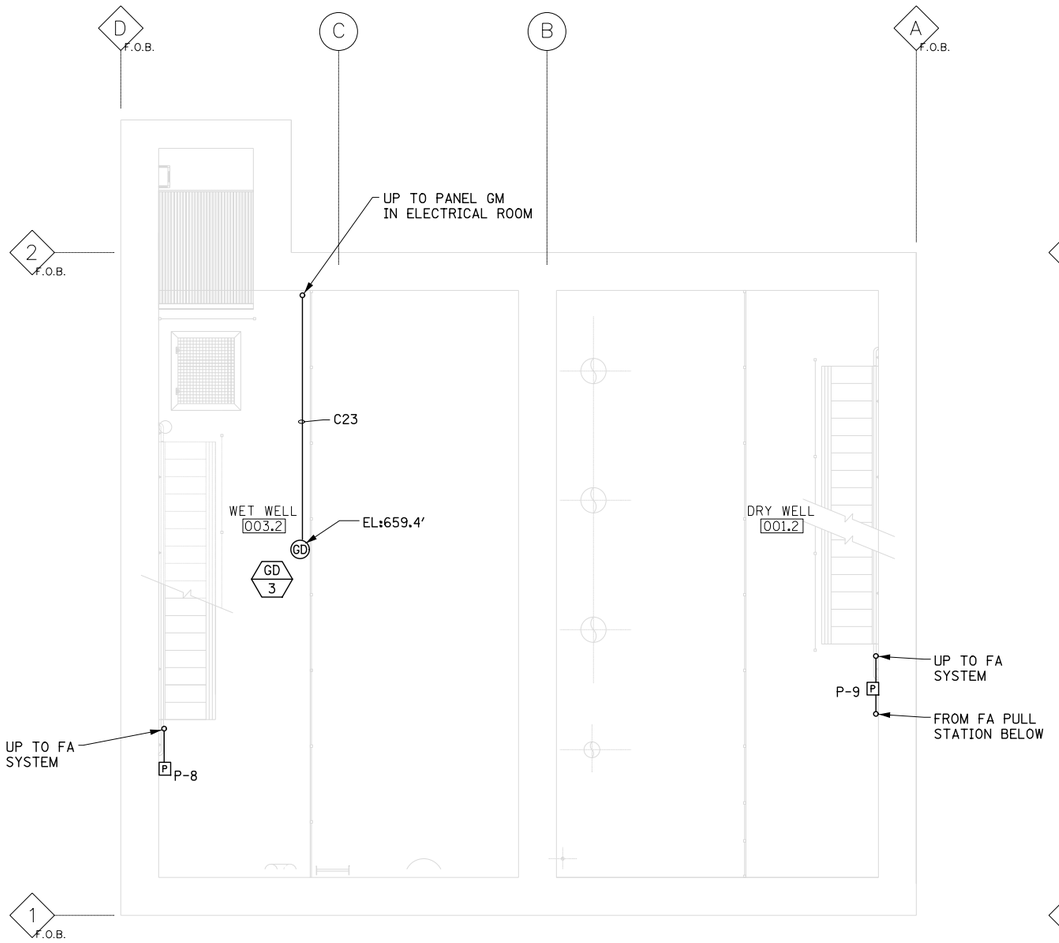
USER NAME = cliss	DESIGNED PNS	REVISED -
	DRAWN MB	REVISED -
PLOT SCALE = 1:31.9994	CHECKED JWM	REVISED -
PLOT DATE = 6/25/2020	DATE 06/26/20	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

FIRE DETECTION, GAS DETECTION AND SECURITY PLAN
PUMP STATION 38

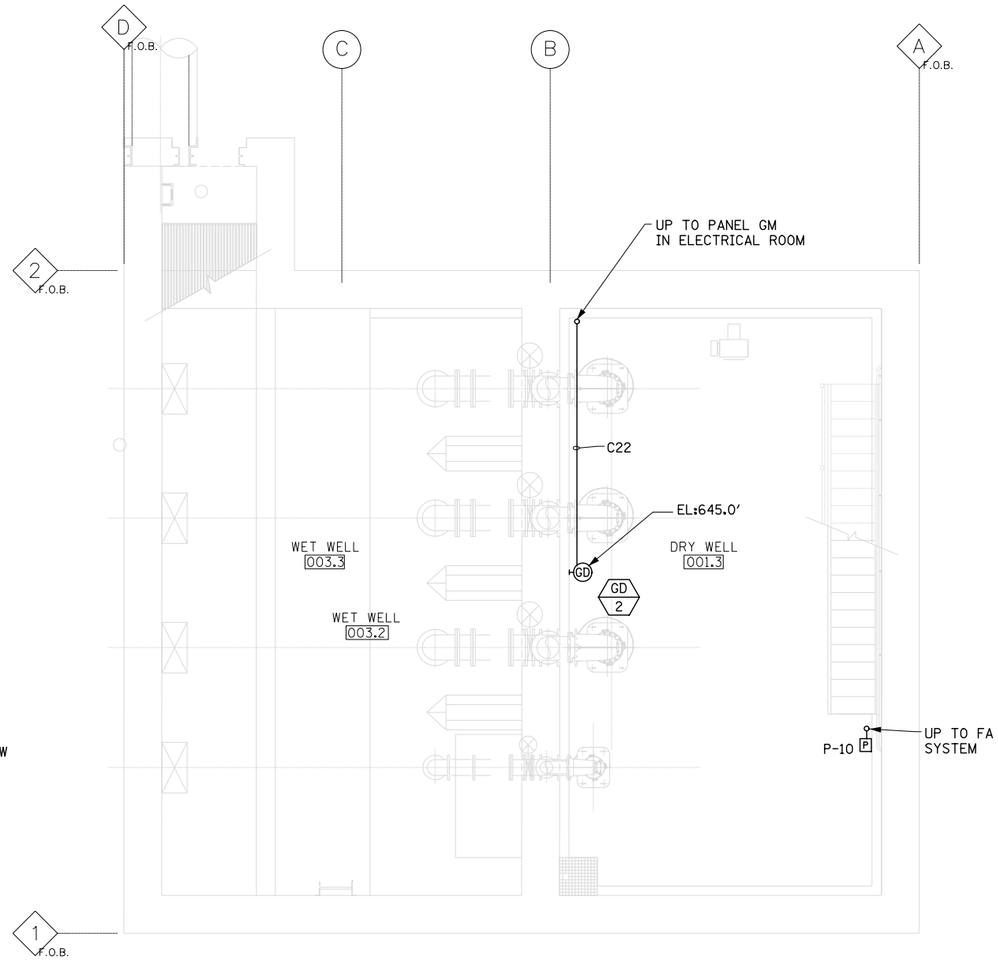
SCALE: | SHEET 1 OF 2 SHEETS | STA. | TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	250
		CONTRACT NO. 62B65		
	ILLINOIS FED. AID PROJECT			



INTERMEDIATE LEVEL PLAN-2 - EL: 651.66

SCALE:: 1/4" = 1'-0"



WELL LEVEL PLAN - EL: 641.00

SCALE:: 1/4" = 1'-0"

NOTE:

SEE SHEET E28 FOR CONDUIT AND CABLE SCHEDULE.

0 4 8 12

SCALE IN FEET

E14

FILE NAME = L:\7395\CADD\Sheets\Building\Electrical\Pump Station 38 - Electrical Drawings\ELECTRICAL 14 FIRE & SECURITY PLANS SHT 2.dgn

KNIGHT
Engineers & Architects

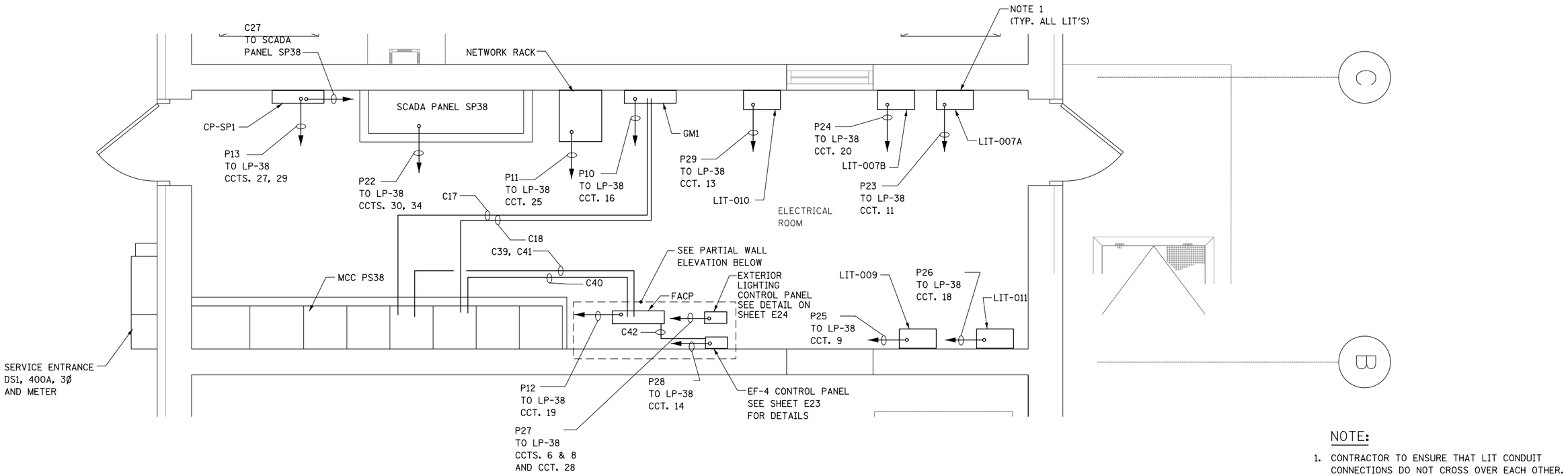
USER NAME = cliss	DESIGNED PNS	REVISED -
	DRAWN MB	REVISED -
PLOT SCALE = 1:32	CHECKED JWM	REVISED -
PLOT DATE = 6/25/2020	DATE 06/26/20	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

FIRE DETECTION, GAS DETECTION AND SECURITY PLAN
PUMP STATION 38

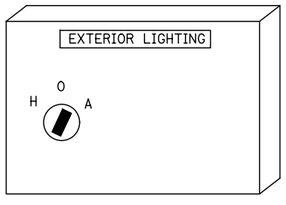
SCALE: | SHEET 2 OF 2 SHEETS | STA. | TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	251
		CONTRACT NO. 62B65		
	ILLINOIS	FED. AID PROJECT		

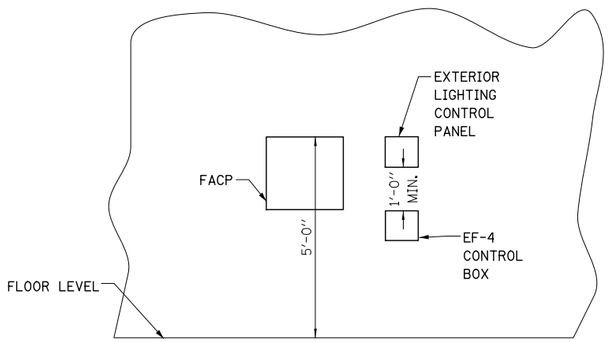


NOTE:

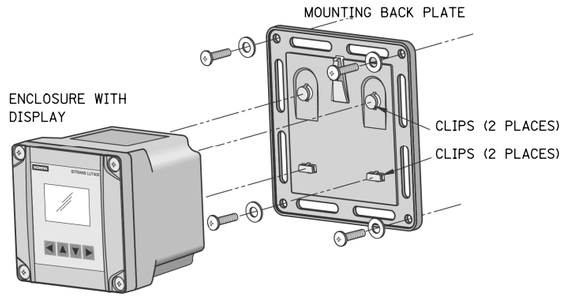
1. CONTRACTOR TO ENSURE THAT LIT CONDUIT CONNECTIONS DO NOT CROSS OVER EACH OTHER.
2. SEE SHEET E28 FOR CONDUIT AND CABLE SCHEDULE.

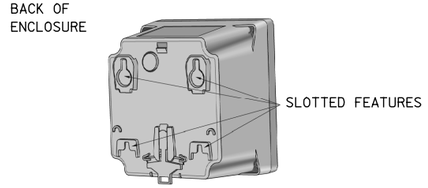


EXTERIOR LIGHTING CONTROL PANEL DETAIL
NO SCALE



PARTIAL WALL ELEVATION
NO SCALE





LIT INSTALLATION DETAILS
NO SCALE

0 2 4 6
SCALE IN FEET

E15

FILE NAME = L:\7355\CAD\Sheets\Building\Electrical\Pump Station 38 - Electrical Drawings\ELECTRICAL 15 ROOM EDPM LAYOUT.dgn

KNIGHT
Engineers & Architects

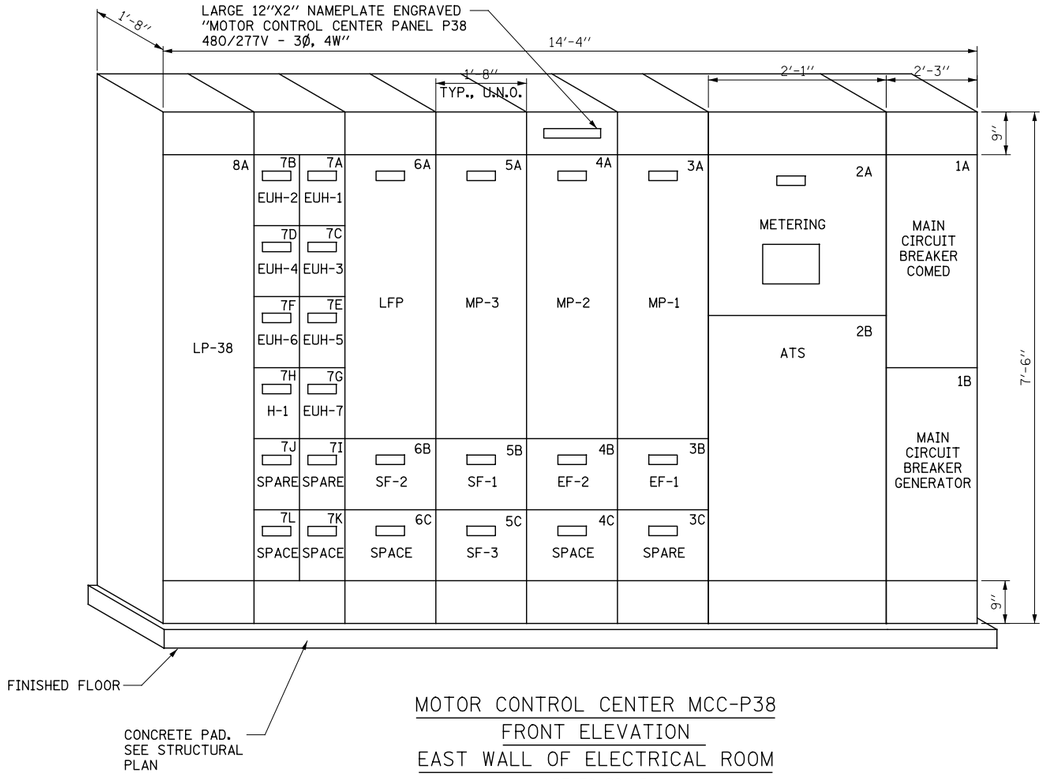
USER NAME = cliss	DESIGNED PNS	REVISED -
	DRAWN MB	REVISED -
PLOT SCALE = 1:12	CHECKED JWM	REVISED -
PLOT DATE = 6/25/2020	DATE 06/26/20	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ELECTRICAL ROOM EQUIPMENT LAYOUT
PUMP STATION 38

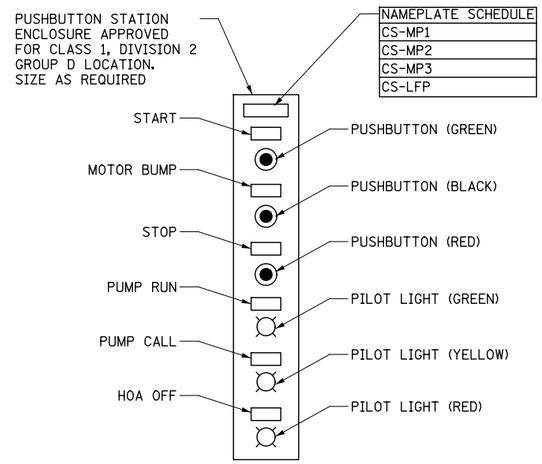
SCALE: | SHEET 1 OF 1 SHEETS | STA. | TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	252
		CONTRACT NO. 62B65		
	ILLINOIS FED. AID PROJECT			

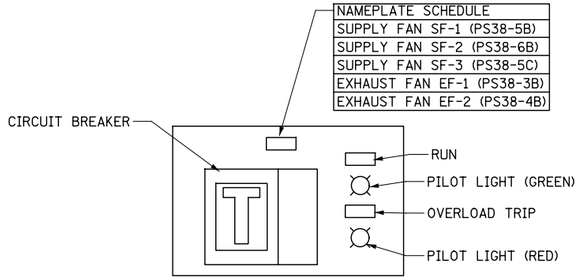


MOTOR CONTROL CENTER MCC-P38
FRONT ELEVATION
EAST WALL OF ELECTRICAL ROOM
NOT TO SCALE

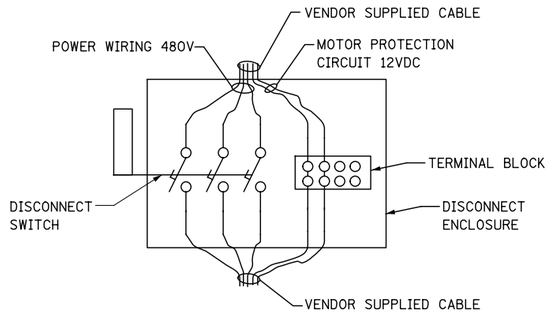
MCC-P38 NAMEPLATE SCHEDULE	
ITEM	NAMEPLATE ENGRAVING
1A	MAIN BREAKER SERVICE (PS38-1A)
1B	MAIN BREAKER GENERATOR (PS38-1B)
2A	ELECTRIC SERVICE METERING (PS38-2A)
2B	AUTOMATIC TRANSFER SWITCH
3A	MAIN PUMP NO. 1 (PS38-3A)
3B	EXHAUST FAN EF-1 (PS38-3B)
3C	SPARE (PS38-3C)
4A	MAIN PUMP NO. 2 (PS38-4A)
4B	EXHAUST FAN EF-2 (PS38-4B)
4C	SPACE (PS38-4C)
5A	MAIN PUMP NO. 3 (PS38-5A)
5B	SUPPLY FAN SF-1 (PS38-5B)
5C	SUPPLY FAN SF-3 (PS38-5C)
6A	LOW FLOW PUMP (PS38-6A)
6B	SUPPLY FAN SF-2 (PS38-6B)
6C	SPACE (PS38-6C)
7A	EUH-1 (PS38-7A)
7B	EUH-2 (PS38-7B)
7C	EUH-3 (PS38-7C)
7D	EUH-4 (PS38-7D)
7E	EUH-5 (PS38-7E)
7F	EUH-6 (PS38-7F)
7G	EUH-7 (PS38-7G)
7H	BRIDGE CRANE HOIST (PS38-7H)
7I	SPARE (PS38-7I)
7J	SPARE (PS38-7J)
7K	SPACE (PS38-7K)
7L	SPACE (PS38-7L)
8A	LIGHTING TRANSFORMER T38-1 AND PANEL LP-P38 (PS38-8A)



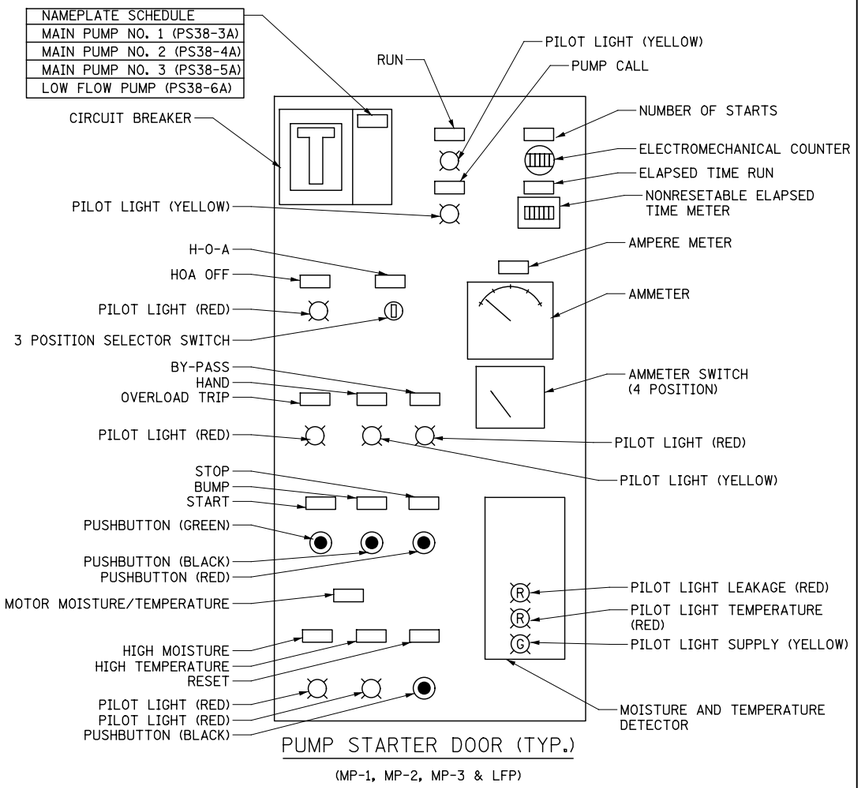
LOCAL CONTROL STATION
(CS-MP1, CS-MP2, CS-MP3 & CS-LFP)



SUPPLY AND EXHAUST FAN STARTER DOOR (TYP.)
(SF-1, SF-2, SF-3, EF-1 & EF-2)



DISCONNECT SWITCH (DS1, DS2, DS3, DS4)
WIRING DETAIL



PUMP STARTER DOOR (TYP.)
(MP-1, MP-2, MP-3 & LFP)

NOTES:

1. ALL NAMEPLATES SHALL BE CENTERED ABOVE DEVICES AND SIZED AS REQUIRED. THE NAMEPLATES SHALL BE ATTACHED WITH BRASS OR STAINLESS STEEL SCREWS. NAMEPLATES SHALL BE WHITE WITH BLACK LETTERS IN CONFORMANCE WITH DIVISION 26 OF THE SPECIFICATIONS. NAMEPLATES LIST SHALL BE APPROVED BY THE ENGINEER BEFORE INSTALLATION. PROVIDE NAMEPLATES AS SHOWN ON THE LEGENDS AND/OR DIRECTED BY THE ENGINEER.

2. DIMENSIONED DRAWINGS SHOWING ALL CUTOUT SIZES AND LOCATIONS ON PANEL MOUNTED EQUIPMENT, SHALL BE SUBMITTED FOR APPROVAL BEFORE CONSTRUCTION.

3. THE MOTOR CONTROL CENTER LAYOUT SHALL GENERALLY CONFORM TO THE LAYOUT SHOWN ON THE CONTRACT DRAWINGS. INSTALL ALL SWITCHES AND CIRCUIT BREAKERS, SO THAT THE CENTER OF THE GRIP WILL NOT BE MORE THAN 6'-6" A.F.F., WITH THE MOTOR CONTROL CENTER ON A 4" CONCRETE PAD.

4. THE RIGHT END OF THE MCC MUST BE SMOOTH TO ALLOW FLUSH MOUNTING OF THE CONTROL PANEL.

FILE NAME = L:\7385\CAD\Sheets\Building\Electrical\Pump Station 38 - Electrical Drawings\ELECTRICAL 16 MCC.dgn

KNIGHT Engineers & Architects

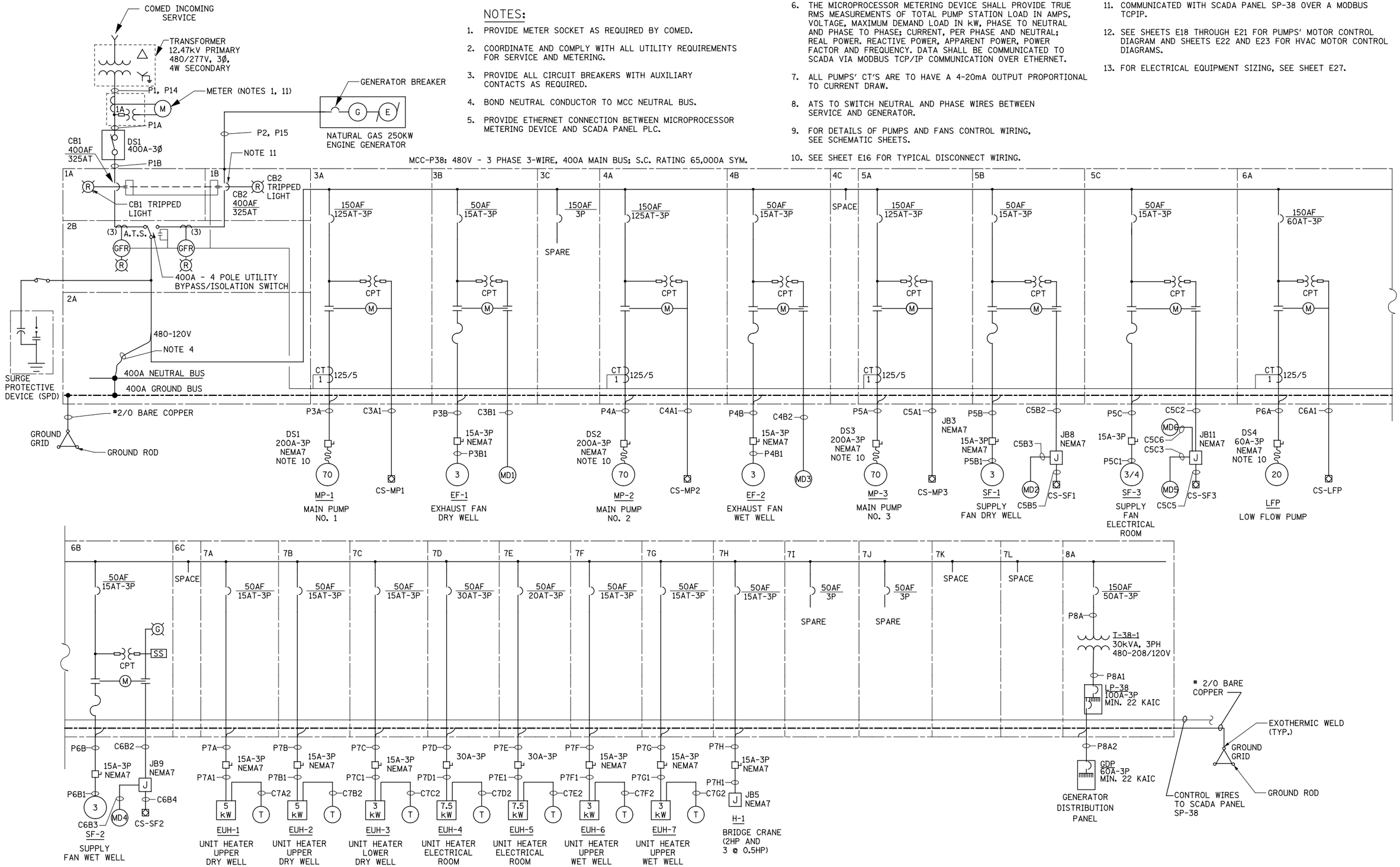
USER NAME = cliss	DESIGNED PNS	REVISED -
	DRAWN MB	REVISED -
PLOT SCALE = 1:2	CHECKED JWM	REVISED -
PLOT DATE = 6/25/2020	DATE 06/26/20	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

MOTOR CONTROL CENTER
PUMP STATION 38

SCALE: | SHEET 1 OF 1 SHEETS | STA. | TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	253
		CONTRACT NO. 62B65		
	ILLINOIS FED. AID PROJECT			



NOTES:

1. PROVIDE METER SOCKET AS REQUIRED BY COMED.
2. COORDINATE AND COMPLY WITH ALL UTILITY REQUIREMENTS FOR SERVICE AND METERING.
3. PROVIDE ALL CIRCUIT BREAKERS WITH AUXILIARY CONTACTS AS REQUIRED.
4. BOND NEUTRAL CONDUCTOR TO MCC NEUTRAL BUS.
5. PROVIDE ETHERNET CONNECTION BETWEEN MICROPROCESSOR METERING DEVICE AND SCADA PANEL PLC.
6. THE MICROPROCESSOR METERING DEVICE SHALL PROVIDE TRUE RMS MEASUREMENTS OF TOTAL PUMP STATION LOAD IN AMPS, VOLTAGE, MAXIMUM DEMAND LOAD IN kW, PHASE TO NEUTRAL AND PHASE TO PHASE; CURRENT, PER PHASE AND NEUTRAL; REAL POWER, REACTIVE POWER, APPARENT POWER, POWER FACTOR AND FREQUENCY. DATA SHALL BE COMMUNICATED TO SCADA VIA MODBUS TCP/IP COMMUNICATION OVER ETHERNET.
7. ALL PUMPS' CT'S ARE TO HAVE A 4-20mA OUTPUT PROPORTIONAL TO CURRENT DRAW.
8. ATS TO SWITCH NEUTRAL AND PHASE WIRES BETWEEN SERVICE AND GENERATOR.
9. FOR DETAILS OF PUMPS AND FANS CONTROL WIRING, SEE SCHEMATIC SHEETS.
10. SEE SHEET E16 FOR TYPICAL DISCONNECT WIRING.
11. COMMUNICATED WITH SCADA PANEL SP-38 OVER A MODBUS TCPIP.
12. SEE SHEETS E18 THROUGH E21 FOR PUMPS' MOTOR CONTROL DIAGRAM AND SHEETS E22 AND E23 FOR HVAC MOTOR CONTROL DIAGRAMS.
13. FOR ELECTRICAL EQUIPMENT SIZING, SEE SHEET E27.

E17

KNIGHT Engineers & Architects	USER NAME = cliss	DESIGNED PNS	REVISED -
		DRAWN MB	REVISED -
	PLOT SCALE = 1:2	CHECKED JWM	REVISED -
	PLOT DATE = 6/25/2020	DATE 06/26/20	REVISED -

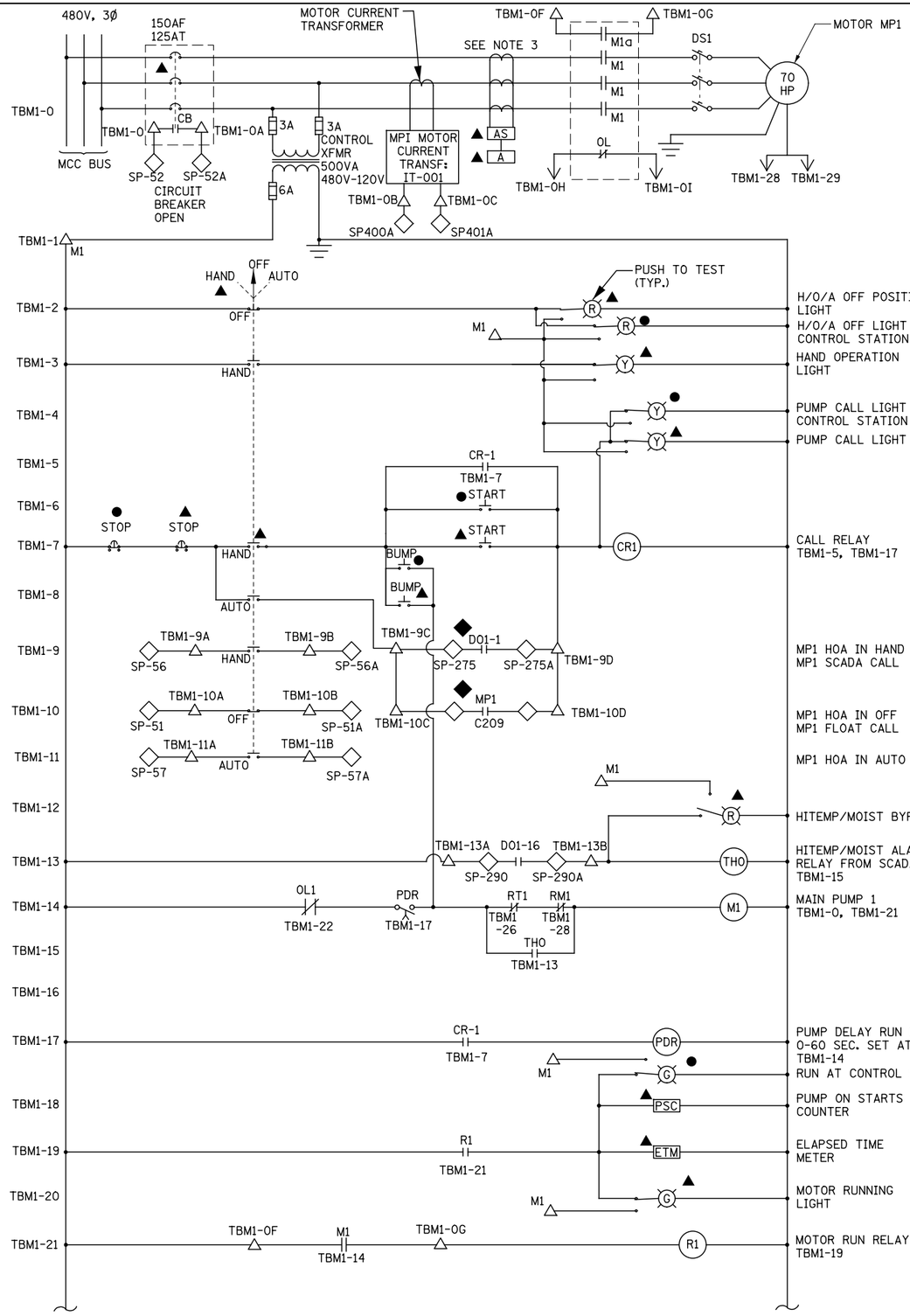
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

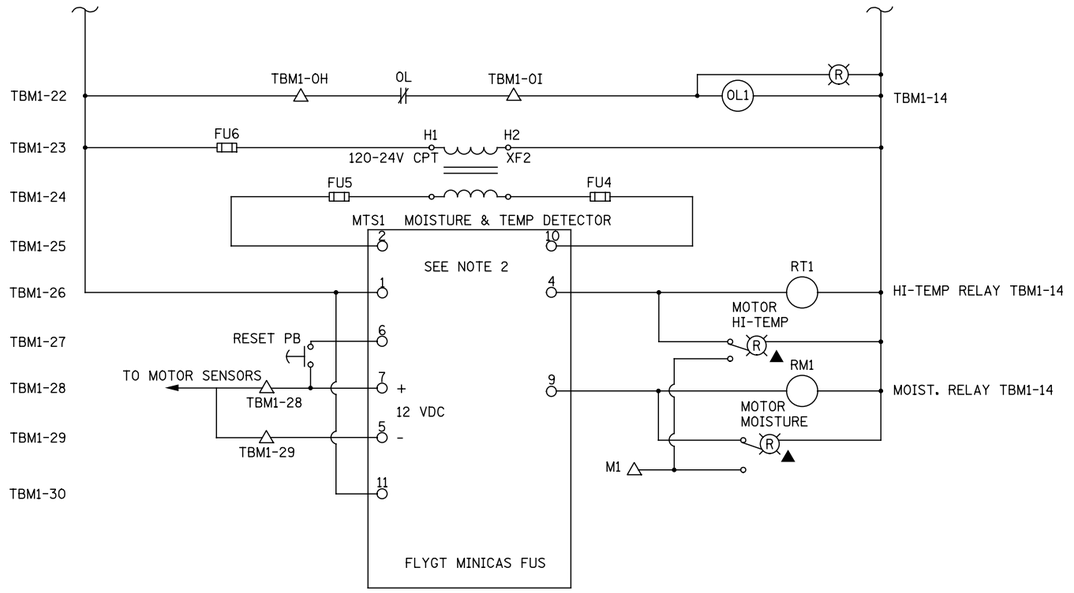
PUMP STATION 38 ONE LINE DIAGRAM

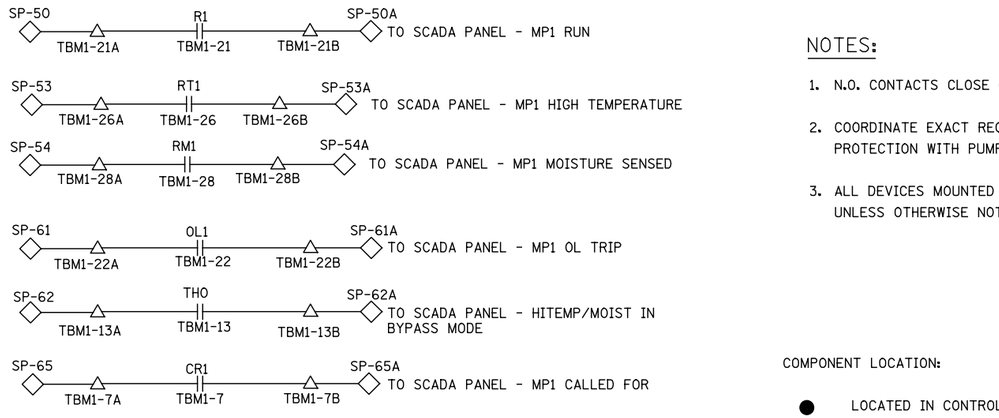
SCALE: | SHEET 1 OF 1 SHEETS | STA. | TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	254
		CONTRACT NO. 62B65		
	ILLINOIS	FED. AID PROJECT		

FILE NAME = L:\7395\CADD\Sheets\Building\Electrical\Pump Station 38 - Electrical Drawings\ELECTRICAL 17 ONE LINE.dgn







NOTES:

1. N.O. CONTACTS CLOSE ON ALARM.
2. COORDINATE EXACT REQUIREMENTS FOR PUMP PROTECTION WITH PUMP MANUFACTURER.
3. ALL DEVICES MOUNTED IN MOTOR STARTER, UNLESS OTHERWISE NOTED.

COMPONENT LOCATION:

- ● LOCATED IN CONTROL STATION PUMP ROOM INTERMEDIATE LEVEL EL: 671.5
- ▲ LOCATED ON RESPECTIVE STARTER DOOR
- ◆ LOCATED IN SCADA PANEL
- △ TERMINAL IN MOTOR STARTER
- ◇ TERMINAL IN SCADA PANEL

MAIN PUMP NO. 1 (MP-1) SCHEMATICS

FILE NAME = L:\7395\CADD\Sheets\Building\Electrical\Pump Station 38 - Electrical Drawings\ELECTRICAL 18 MP1 SCHEMATICS.dgn

KNIGHT Engineers & Architects

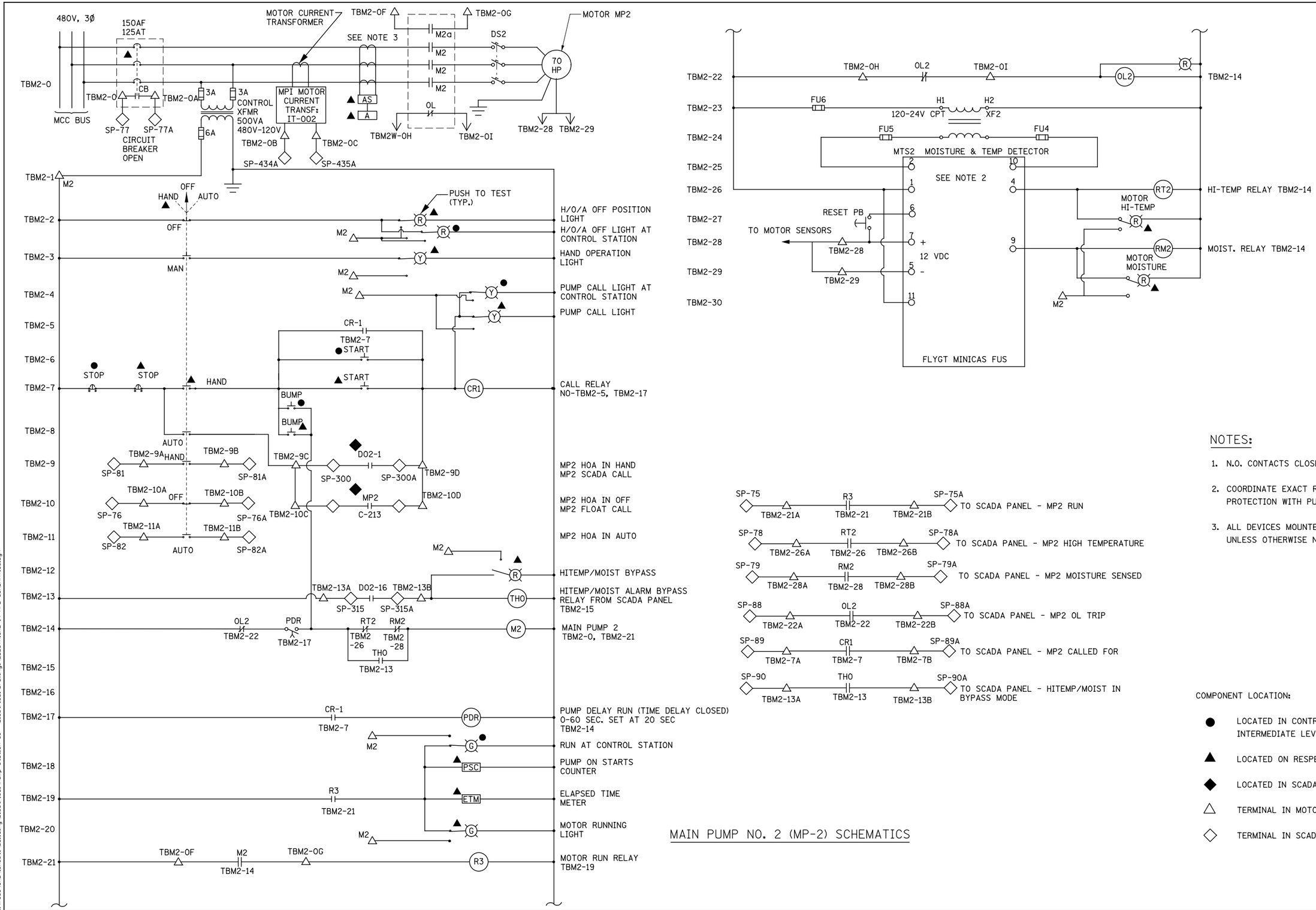
USER NAME = cliss	DESIGNED PNS	REVISED -
	DRAWN MB	REVISED -
PLOT SCALE = 1:2	CHECKED JWM	REVISED -
PLOT DATE = 6/25/2020	DATE 06/26/20	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

MAIN PUMP NO. 1 SCHEMATICS
PUMP STATION 38

SCALE: | SHEET 1 OF 1 SHEETS | STA. | TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	255
		CONTRACT NO. 62B65		
		ILLINOIS FED. AID PROJECT		



NOTES:

1. N.O. CONTACTS CLOSE ON ALARM.
2. COORDINATE EXACT REQUIREMENTS FOR PUMP PROTECTION WITH PUMP MANUFACTURER.
3. ALL DEVICES MOUNTED IN MOTOR STARTER, UNLESS OTHERWISE NOTED.

COMPONENT LOCATION:

- ● LOCATED IN CONTROL PANEL PUMP ROOM INTERMEDIATE LEVEL EL: 671.5
- ▲ LOCATED ON RESPECTIVE STARTER DOOR
- ◆ LOCATED IN SCADA PANEL
- △ TERMINAL IN MOTOR STARTER
- ◇ TERMINAL IN SCADA PANEL

MAIN PUMP NO. 2 (MP-2) SCHEMATICS

E19

FILE NAME = L:\7355\CAD\Sheets\Building\Electrical\Pump Station 38 - Electrical Drawings\ELECTRICAL 19 MP2 SCHEMATICS.dgn

KNIGHT Engineers & Architects

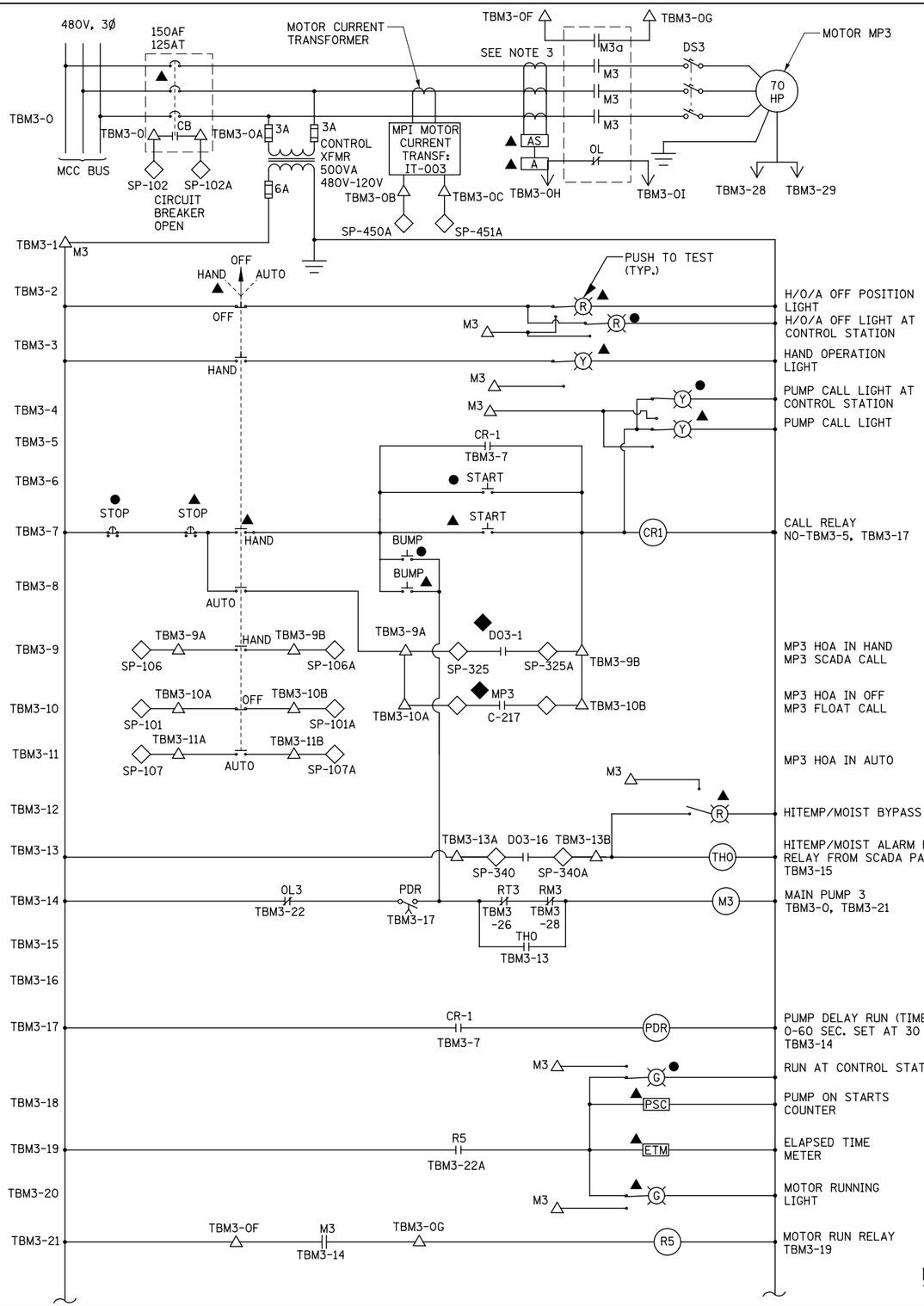
USER NAME = cliss	DESIGNED PNS	REVISED -
	DRAWN MB	REVISED -
PLOT SCALE = 1:2	CHECKED JWM	REVISED -
PLOT DATE = 6/25/2020	DATE 06/26/20	REVISED -

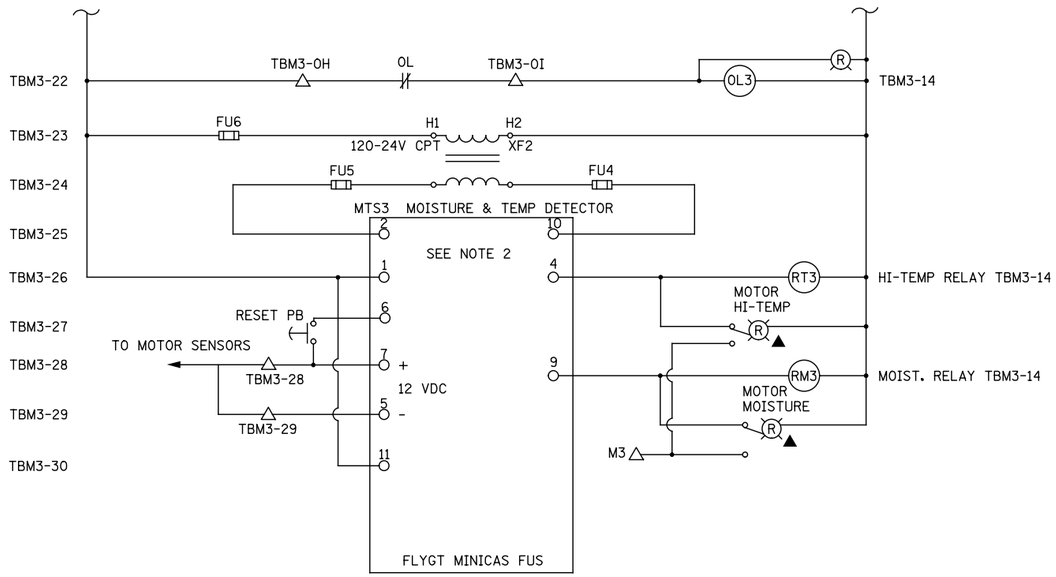
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

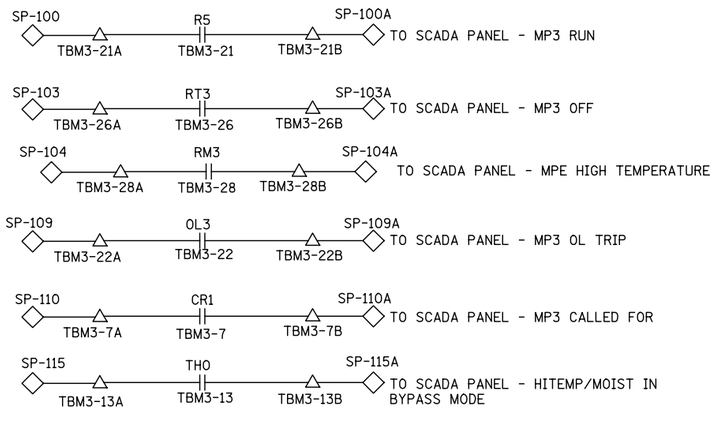
MAIN PUMP NO. 2 SCHEMATICS
PUMP STATION 38

SCALE: | SHEET 1 OF 1 SHEETS | STA. | TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	256
		CONTRACT NO. 62B65		
	ILLINOIS	FED. AID PROJECT		







NOTES:

1. N.O. CONTACTS CLOSE ON ALARM.
2. COORDINATE EXACT REQUIREMENTS FOR PUMP PROTECTION WITH PUMP MANUFACTURER.
3. ALL DEVICES MOUNTED IN MOTOR STARTER, UNLESS OTHERWISE NOTED.

COMPONENT LOCATION:

- ● LOCATED IN CONTROL STATION PUMP ROOM INTERMEDIATE LEVEL EL: 671.5
- ▲ LOCATED ON RESPECTIVE STARTER DOOR
- ◆ LOCATED IN SCADA PANEL
- △ TERMINAL IN MOTOR STARTER
- ◇ TERMINAL IN SCADA PANEL

MAIN PUMP NO. 3 (MP-3) SCHEMATICS

E20

FILE NAME = L:\7565\CAD\Sheets\Building\Electrical\Pump Station 38 - Electrical Drawings\ELECTRICAL 20 MP3 SCHEMATICS.dgn

KNIGHT Engineers & Architects

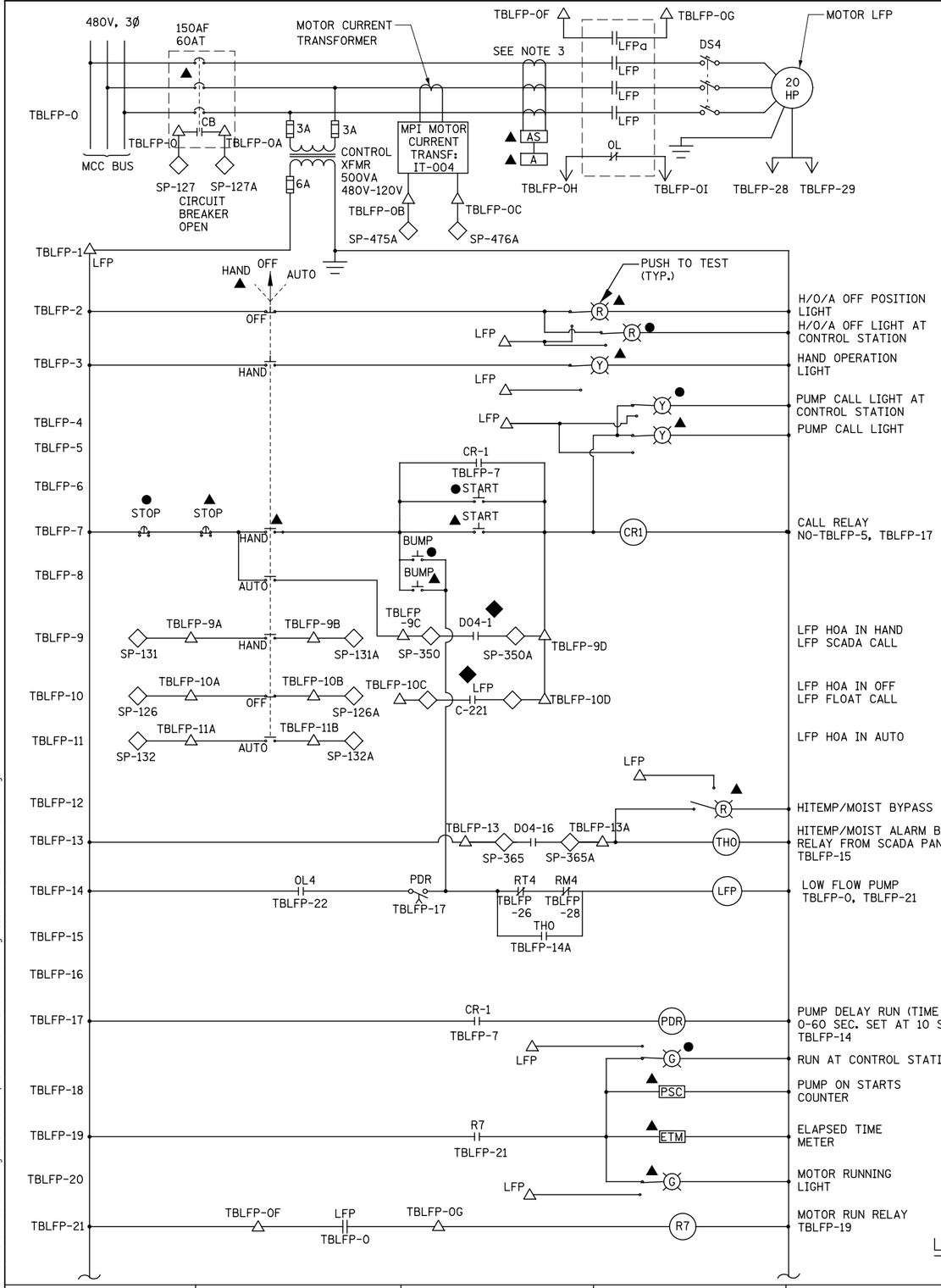
USER NAME = cliss	DESIGNED PNS	REVISED -
	DRAWN MB	REVISED -
PLOT SCALE = 1:2	CHECKED JWM	REVISED -
PLOT DATE = 6/25/2020	DATE 06/26/20	REVISED -

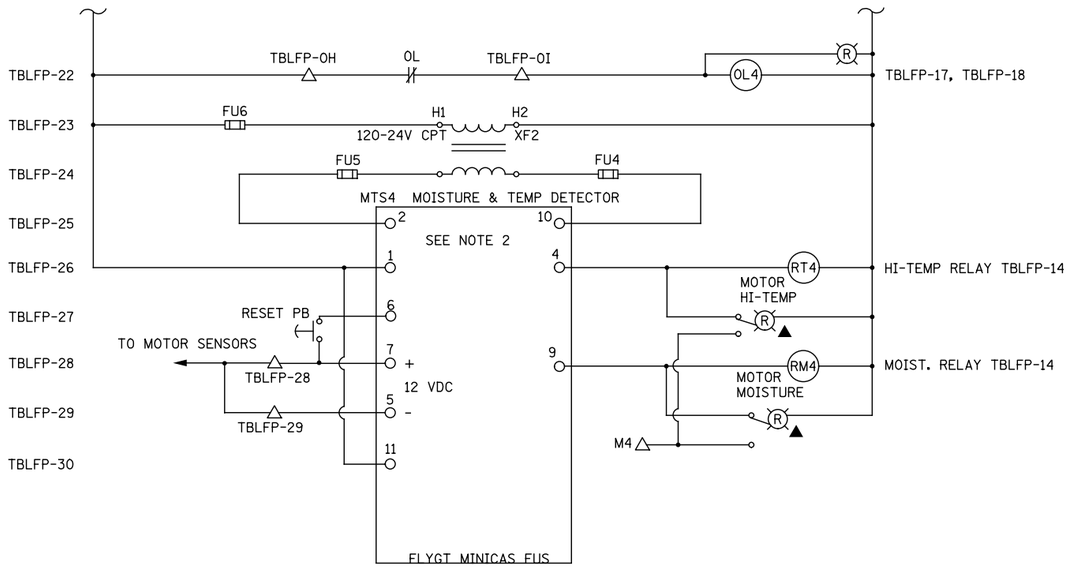
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

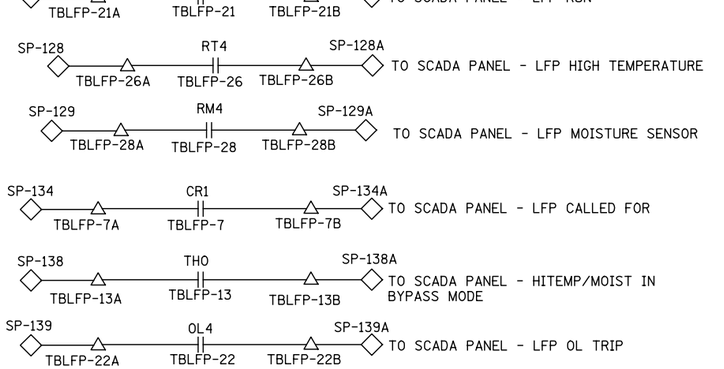
MAIN PUMP NO. 3 SCHEMATICS
PUMP STATION 38

SCALE: | SHEET 1 OF 1 SHEETS | STA. | TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	257
		CONTRACT NO. 62B65		
	ILLINOIS FED. AID PROJECT			







NOTES:

1. N.O. CONTACTS CLOSE ON ALARM.
2. COORDINATE EXACT REQUIREMENTS FOR PUMP PROTECTION WITH PUMP MANUFACTURER.
3. ALL DEVICES MOUNTED IN MOTOR STARTER, UNLESS OTHERWISE NOTED.

COMPONENT LOCATION:

- ● LOCATED IN CONTROL STATION PUMP ROOM INTERMEDIATE LEVEL EL: 671.5
- ▲ LOCATED ON RESPECTIVE STARTER DOOR
- ◆ LOCATED IN SCADA PANEL
- △ TERMINAL IN MOTOR STARTER
- ◇ TERMINAL IN SCADA PANEL

LOW FLOW PUMP NO. 4 (LFP) SCHEMATICS

E21

FILE NAME = L:\7955\CAD\Sheets\Building\Electrical\Pump Station 38 - Electrical Drawings\ELECTRICAL 21 LFP4 SCHEMATICS.dgn

KNIGHT Engineers & Architects

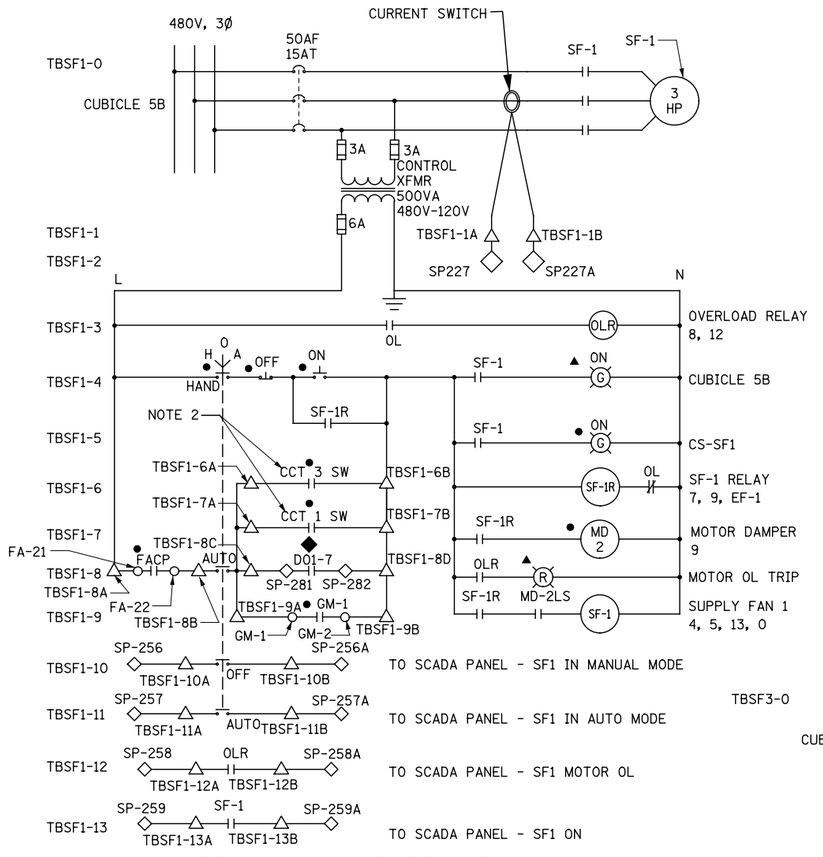
USER NAME = cliss	DESIGNED PNS	REVISED -
	DRAWN MB	REVISED -
PLOT SCALE = 1:2	CHECKED JWM	REVISED -
PLOT DATE = 6/25/2020	DATE 06/26/20	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

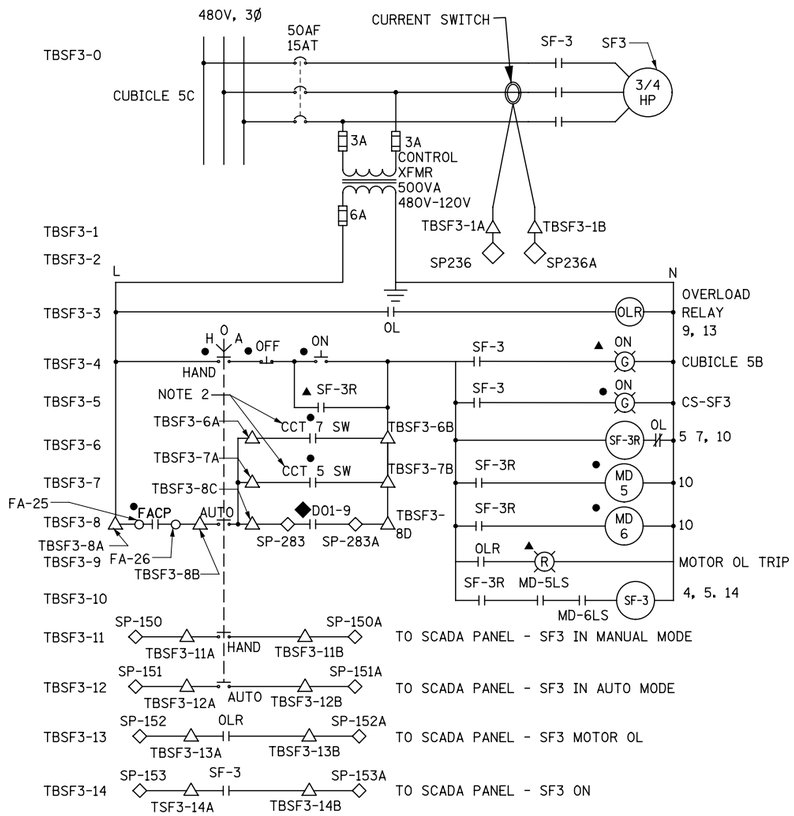
LOW FLOW PUMP NO. 4 SCHEMATICS
PUMP STATION 38

SCALE: | SHEET 2 OF 3 SHEETS | STA. | TO STA.

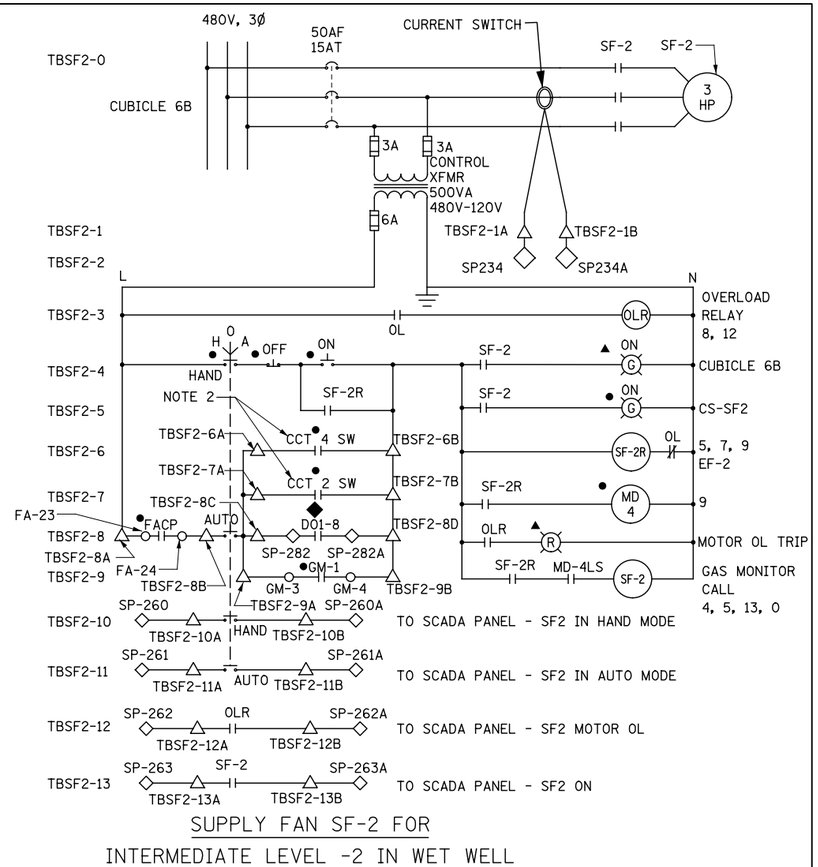
F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	258
		CONTRACT NO. 62B65		
	ILLINOIS FED. AID PROJECT			



SUPPLY FAN SF-1 IN DRY WELL



SUPPLY FAN SF-3 IN ELECTRICAL ROOM



SUPPLY FAN SF-2 FOR
INTERMEDIATE LEVEL -2 IN WET WELL

NOTES:

1. GS-1 AND GS-2 ARE CONTACTS IN THE COMBUSTIBLE GAS MONITORING PANEL GM1. SEE SHEET E24.

2. SEE SHEET E10 FOR SWITCH LOCATION.

COMPONENT LOCATION:

- ● LOCATED REMOTE IN FIELD
- ◆ LOCATED IN SCADA PANEL SP38
- ▲ LOCATED IN RESPECTIVE MCC STARTER DOOR
- ◇ TERMINAL IN SCADA PANEL SP38
- △ TERMINAL IN RESPECTIVE EQUIPMENT
- ○ TERMINAL REMOTE IN THE FIELD

UNLESS OTHERWISE INDICATED ALL ITEMS WITHOUT FURTHER DESIGNATION SHALL BE LOCATED IN THE RESPECTIVE STARTER COMPARTMENT

E22

FILE NAME = L:\7955\CAD\Sheets\Building\Electrical\Pump Station 38 - Electrical Drawings\ELECTRICAL 22 SCHEMATICS & DIAGRAMS.dgn

KNIGHT
Engineers & Architects

USER NAME = cliss	DESIGNED PNS	REVISED -
	DRAWN MB	REVISED -
PLOT SCALE = 1:2	CHECKED JWM	REVISED -
PLOT DATE = 6/25/2020	DATE 06/26/20	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

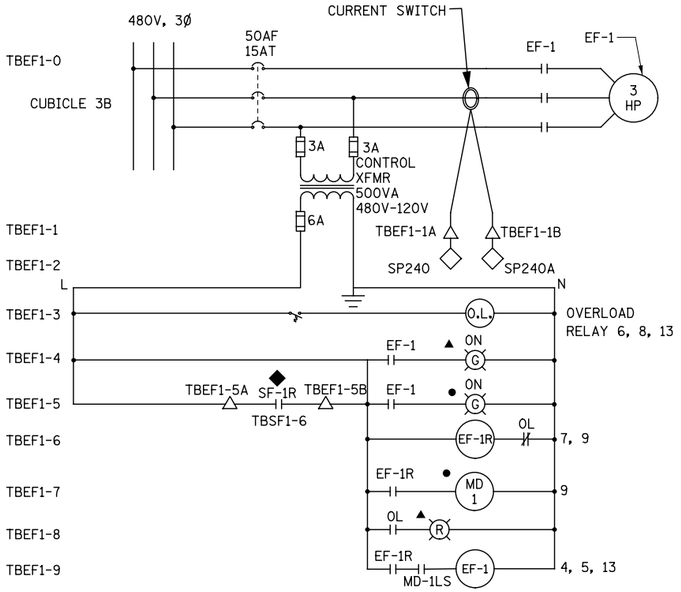
ELECTRICAL SCHEMATIC DIAGRAMS AND DETAILS
PUMP STATION 38

SCALE: | SHEET 1 OF 3 SHEETS | STA. | TO STA.

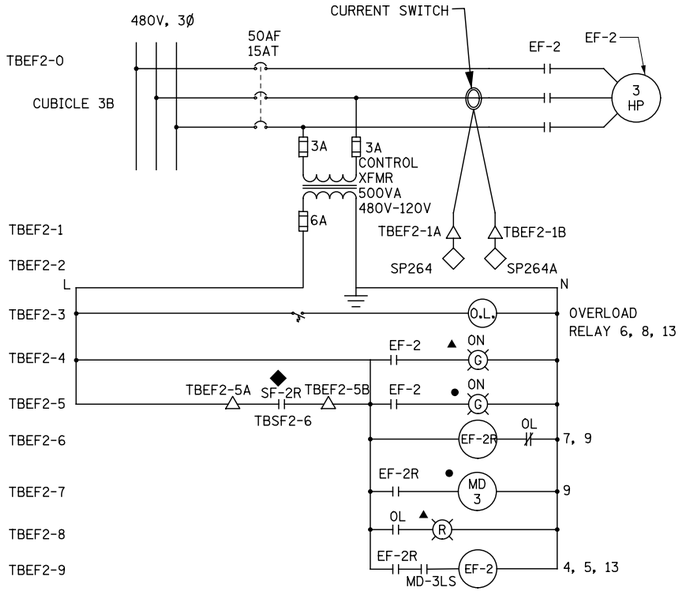
F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	259

CONTRACT NO. 62B65

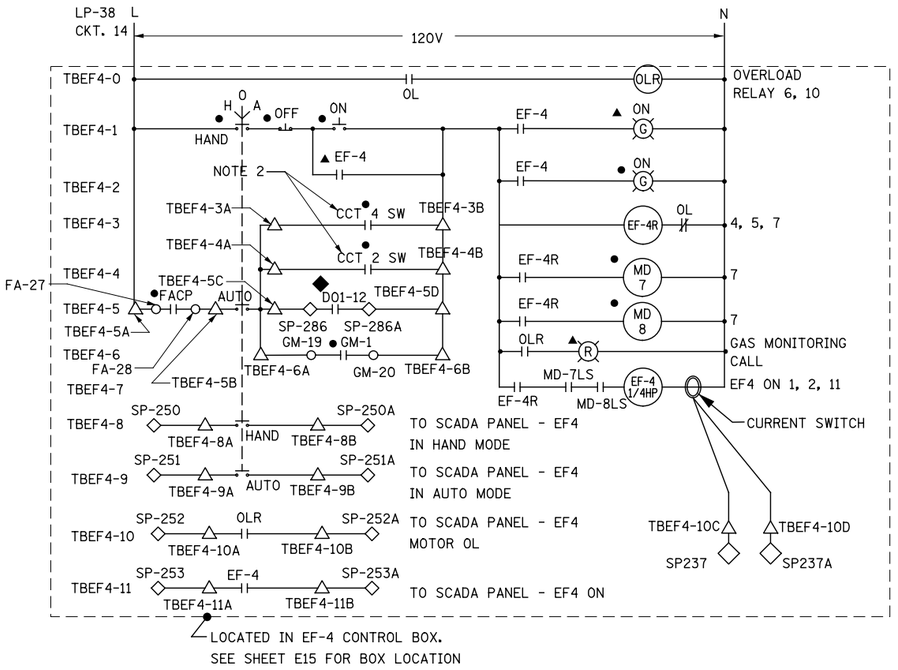
ILLINOIS | FED. AID PROJECT



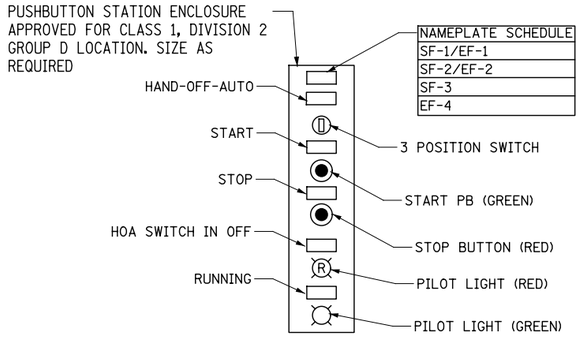
EXHAUST FAN EF-1 IN DRY WELL



EXHAUST FAN EF-2 IN WET WELL



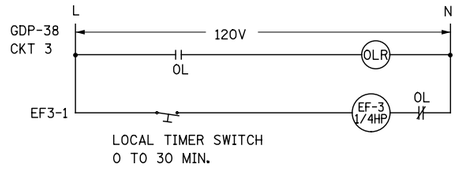
EXHAUST FAN EF-4 IN WET WELL GROUND FLOOR



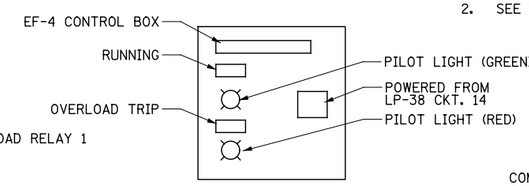
MATERIAL LIST (TYP. FOR EACH STATION)	
QTY	DESCRIPTION
AS REQD.	NEMA 7 PB ENCLOSURE
1	NAMEPLATE (SEE SCHEDULE)
1	NEMA 7 PILOT LIGHT, LED, GREEN
1	NEMA 7 PILOT LIGHT, LED, RED

LOCAL
CONTROL
STATION

(CS-SF-1/EF-1, CS-SF-2/EF-2,
CS-SF-3 & CS-EF-4)



EXHAUST FAN EF-3
IN GENERATOR ROOM



CONTRACTOR TO SIZE BOX TO HOLD
ALL COMPONENTS

EF-4 CONTROL BOX

NOTES:

1. GS-1 AND GS-2 ARE CONTACTS IN THE COMBUSTIBLE GAS MONITORING PANEL GM1. SEE SHEET E24.
2. SEE SHEET E10 FOR SWITCH LOCATION.

COMPONENT LOCATION:

- ● LOCATED REMOTE IN FIELD
- ◆ LOCATED IN SCADA PANEL SP38
- ▲ LOCATED IN RESPECTIVE MCC STARTER DOOR
- ◇ TERMINAL IN SCADA PANEL SP38
- △ TERMINAL IN RESPECTIVE EQUIPMENT
- ○ TERMINAL REMOTE IN THE FIELD

UNLESS OTHERWISE INDICATED ALL ITEMS WITHOUT FURTHER DESIGNATION SHALL BE LOCATED IN THE RESPECTIVE STARTER COMPARTMENT

FILE NAME = L:\7385\CAD\Sheets\Building\Electrical\Pump Station 38 - Electrical Drawings\ELECTRICAL 23 SCHEMATICS & DIAGRAMS 1.dgn

KNIGHT
Engineers & Architects

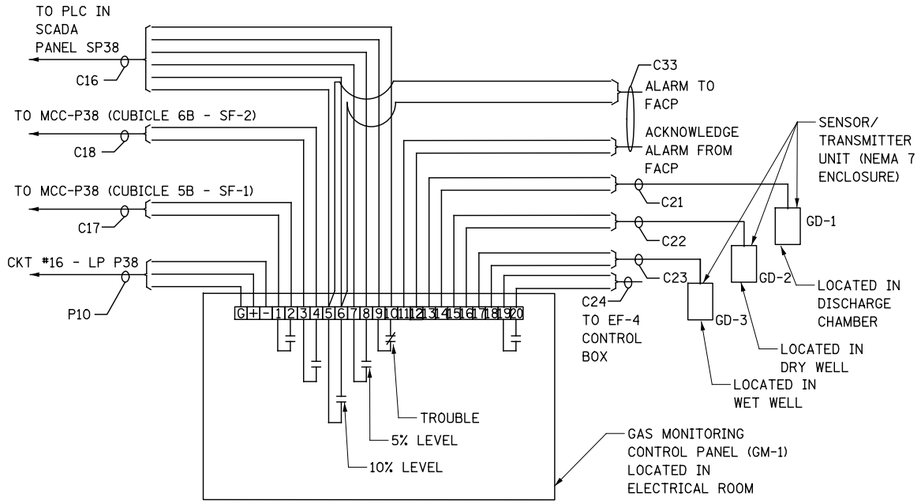
USER NAME = cliss	DESIGNED PNS	REVISED -
	DRAWN MB	REVISED -
PLOT SCALE = 1:2	CHECKED JWM	REVISED -
PLOT DATE = 6/25/2020	DATE 06/26/20	REVISED -

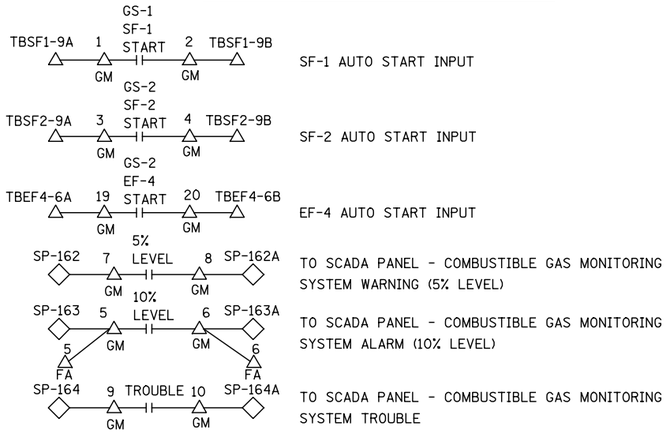
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ELECTRICAL SCHEMATIC DIAGRAMS AND DETAILS
PUMP STATION 38

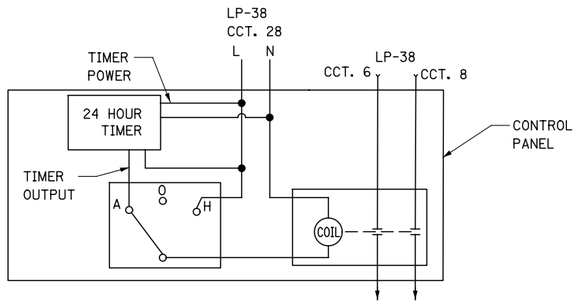
SCALE: | SHEET 2 OF 3 SHEETS | STA. | TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	260
		CONTRACT NO. 62B65		
	ILLINOIS FED. AID PROJECT			

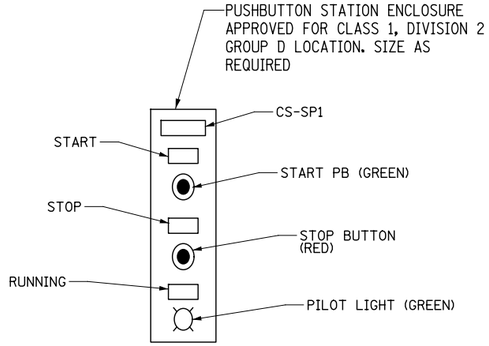




COMBUSTIBLE GAS MONITOR SYSTEM
BLOCK DIAGRAM

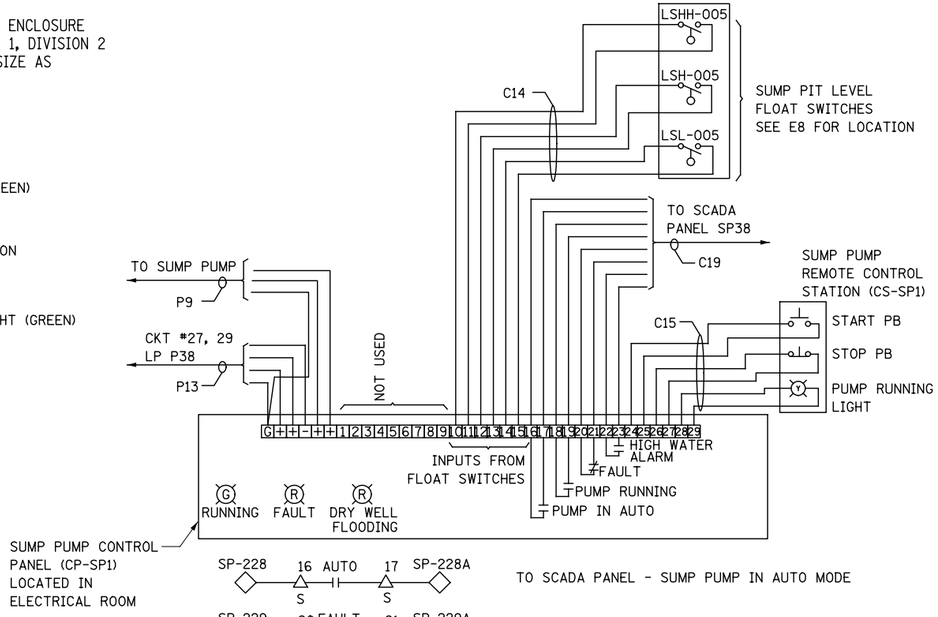


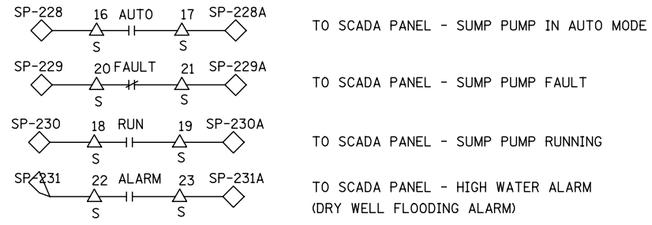
EXTERIOR LIGHTING CONTROL PANEL



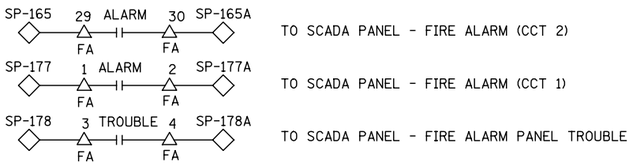
MATERIAL LIST	
QTY	DESCRIPTION
AS REQD.	NEMA 7 PB ENCLOSURE
1	NAMEPLATE
1	NEMA 7 PILOT LIGHT, LED, RED

LOCAL CONTROL STATION
(CS-SP1)





SUMP PUMP CONTROL SYSTEM
BLOCK DIAGRAM



FIRE ALARM SYSTEM
BLOCK DIAGRAM

NOTE:

CONTRACTOR SHALL PROVIDE A COMPLETE FIRE ALARM SYSTEM INCLUDING THE 'FACP' AND ALL ASSOCIATED EQUIPMENT AS SHOWN ON THE DRAWINGS (AT A MINIMUM) AND AS REQUIRED BY NFPA 72. VERIFY AND INCORPORATE ALL FIRE ALARM SYSTEM REQUIREMENTS. THE FIRE ALARM VENDOR / CONTRACTOR SHALL PROVIDE FINAL SHOP DRAWINGS DESIGNED BY A NICET CERTIFIED DESIGNER. DRAWINGS SHALL BE APPROVED BY THE OWNER PRIOR TO SUBMISSION TO THE 'AHJ'.

FILE NAME = L:\7355\CAD\Sheets\Building\Electrical\Pump Station 38 - Electrical Drawings\ELECTRICAL 24 SCHEMATIC DIAGRAMS & DETAILS.dgn

KNIGHT Engineers & Architects

USER NAME = cliss	DESIGNED PNS	REVISED -
	DRAWN MB	REVISED -
PLOT SCALE = 1:2	CHECKED JWM	REVISED -
PLOT DATE = 6/25/2020	DATE 06/26/20	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ELECTRICAL SCHEMATIC DIAGRAMS AND DETAILS
PUMP STATION 38

SCALE: | SHEET 3 OF 3 SHEETS | STA. | TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	261
		CONTRACT NO. 62B65		
	ILLINOIS FED. AID PROJECT			

REVISES STANDARD DATED 10-31-02
COMPATIBLE UNITS AVAILABLE IN PASSPORT

9-12-08
C5286
PAGE 1 OF 6

3-PH RADIAL COMPT TR PAD - ESS (1)(23)(29)

SIZE OF TRANSFORMER

C5286.B 45 - 225kVA 120/208V
.C 112.5 - 300kVA 120/208V
.D 225 - 500kVA 120/208V
.E 750kVA 120/208V
.F 45 - 75kVA 277/480V
.G 112.5 - 300kVA 277/480V
.H 225 - 1000kVA 277/480V
.J 1500 - 2500kVA 277/480V
.K 500 - 750kVA 4kV
.L 1000 - 2500kVA 4kV

ITEM	CAT ID DESCRIPTION TABLE-1		CAT ID	UNIT	QUANTITY B	C	D	E	F	G	H	J	K	L
A	GROUNDING INSTALLATION C5550..GD	(1)			1	1	1	1	1	1	1	1	1	1
B	WIRE,COPPER, OVERHEAD, BARE, 1/0, 19 STR, SOFT DRAWN TINNED, 3	(1)(2)	0000355062	FT	55	55	60	60	50	55	60	70	60	65
C	CONNECTOR, COMPRESSION, 1/0 OR 2/0 STR CU. RUN & TAP, BURNDY C	(2)	0000368545	EA	1	1	1	1	1	1	1	1	1	1

NOTES:

APPLICATION

- THIS STANDARD SHALL BE USED TO INSTALL AN ELECTRIC SERVICE STATION FOUNDATION FOR A 3Ø RADIAL-FEED COMPARTMENTAL TRANSFORMER AS DESCRIBED IN "ComEd's GENERAL TERMS AND CONDITIONS".

SUPPLEMENTARY MATERIAL

(1) WHEN BARE LEAD COVERED CABLES ARE LOCATED OR PLANNED WITHIN 200 FEET, REPLACE ITEM "B" WITH 1/0 LEAD CLAD COPPER CONDUCTOR (CAT ID 0000360809) AND SPECIFY GROUND RODS IN ACCORDANCE WITH C8550. ENGINEER TO SPECIFY WHEN THIS CONDITION EXISTS.

(2) WHEN JUNCTION CABINET IS USED, ADD ONE OF ITEM "C" AND ADD 15 FEET OF ITEM "B".

(3) STEEL PLATE NOT FURNISHED WITH STANDARD. ORDER FROM SYSTEMS SHOPS AT TECH CENTER OR LOCAL VENDOR.

INFORMATION

(11) CUSTOMER SHALL SUPPLY AND INSTALL ALL ITEMS WITHIN THIS STANDARD EXCEPT FOR THE GROUNDING MATERIAL.

(12) PRECAST ALTERNATIVES TO THIS POURED DESIGN MAY BE AVAILABLE. CONTACT DISTRIBUTION ENGINEERING DEPARTMENT FOR DETAILS.

(13) DO NOT PLACE CONDUITS UNDER THIS SECTION OF FOUNDATION IF AVOIDABLE.

(14) DO NOT DISTURB GROUND IN FOUNDATION AREA MORE THAN NECESSARY WHEN INSTALLING CONDUIT.

(15) PRIMARY AND SECONDARY CONDUIT MUST COME THROUGH FOUNDATION IN DESIGNATED AREAS.

(16) CONDUIT SHALL TERMINATE FLUSH WITH THE TOP OF THE FOUNDATION UNLESS OTHERWISE DESIGNATED.

(17) IF METAL CONDUIT IS USED, THE GROUNDING BUSHING SHALL NOT PROTRUDE ABOVE THE TOP OF THE FOUNDATION.

(18) AFTER PRIMARY AND SECONDARY CONDUITS ARE IN PLACE, BACKFILL WITH SCREENINGS, SAND OR FINE EXCAVATED MATERIAL. COMPACT THOROUGHLY BEFORE PLACING AGGREGATE AND POURING FOUNDATION.

(19) CONCRETE SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE APPLICABLE ACI CODE. IT SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS. AIR ENTRAINMENT SHALL BE 4 TO 7% OF THE VOLUME OF CONCRETE.

(20) TOP OF THE FOUNDATION SHALL BE SMOOTH AND LEVEL.

(21) GROUND GRID CONSISTS OF A CONTINUOUS COPPER GROUND LOOP. BRING ONE TAIL OF GROUND LOOP INTO EACH OPENING IN FOUNDATION. CONNECT GROUND CABLE (ITEM "B") TO GROUND RODS AS SHOWN IN C8550. CLOSE LOOP WITH COMPRESSION CONNECTOR (ITEM "C").

WHEN LEAD CLAD CABLE IS USED FOR THE GROUND CABLE, COVER THE ITEM "C" CONNECTION WITH MOISTURE SEALING COMPOUND AND PLASTIC TAPE AS SHOWN IN DETAIL-1.

(22) FINAL GRADE SHALL SLOPE AWAY FROM FOUNDATION. FINAL GRADE SHALL BE WELL DRAINED AT ALL TIMES.

(23) A JUNCTION CABINET IS REQUIRED IF SECONDARY CONDUIT SPACE REQUIREMENTS EXCEED LIMITS SPECIFIED IN TABLE-A. REFER TO PAGE 3 FOR DETAILS OF NECESSARY FOUNDATION.

(24) CONTACT DISTRIBUTION ENGINEERING DEPARTMENT FOR APPROVED SUPPLIERS OF JUNCTION CABINET. ALTERNATIVE DESIGNS MAY BE SUBMITTED FOR APPROVAL.

(25) CABINET SHALL BE ANCHORED TO THE FOUNDATION.

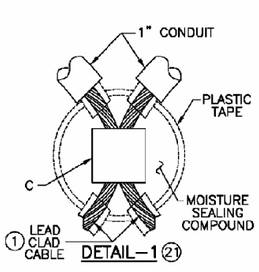
(26) ComEd WILL FURNISH AND INSTALL CABLE AND LUGS BETWEEN JUNCTION CABINET BUS AND TRANSFORMER SECONDARY TERMINALS.

(27) CUSTOMER SHALL NOT CONNECT THEIR CABLES TO BUS IN AREAS DESIGNATED AS ComEd POSITIONS.

(28) BUS BAR SHOWN CAN ACCOMMODATE A MAXIMUM OF 20 CABLES PER PHASE FROM CUSTOMER AND 10 CABLES PER PHASE FROM ComEd TRANSFORMER.

(29) CONSULT SPILL PREVENTION, CONTROL AND COUNTERMEASURES (SPCC) PROGRAM OR ENVIRONMENTAL SERVICES IF TOTAL OIL CAPACITY EQUAL TO OR EXCEEDING 1320 GALLONS EXISTS OR IS PLANNED AT ESS SITE.

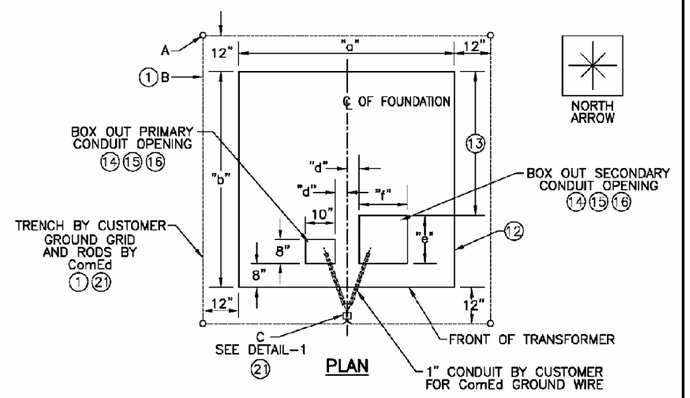
30 FOR TRANSFORMER CLEARANCES REFER TO STANDARDS C5284, C5285, AND C7500.



Exelon. Energy Delivery · SYSTEM STANDARD

3 PHASE TRANSFORMER PAD
NOT TO SCALE

9-12-08
C5286
PAGE 2 OF 6



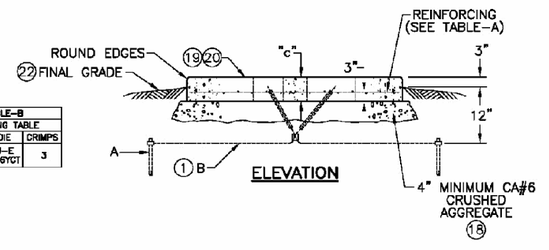


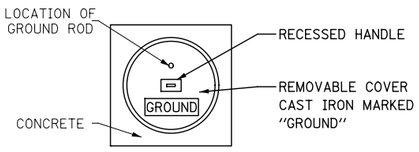
TABLE-B
PRESSING TABLE

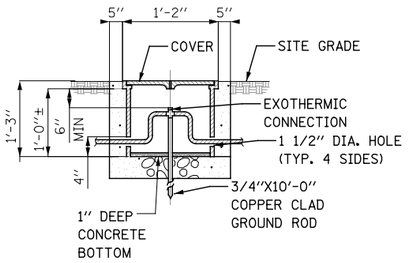
TOOL	DIE	CRIMPS
Y35	U-E U26YCT	3

TABLE-A

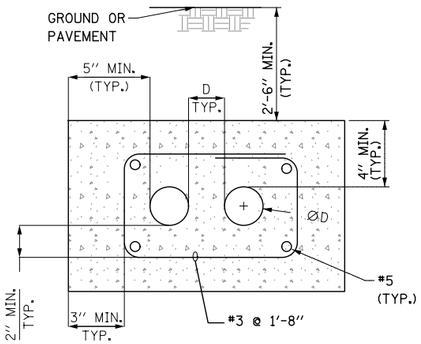
C5286	TRANSFORMER KVA MIN	KVA MAX	MIN SEC VOLTAGE	DIMENSIONS a	b	c	d	e	f	SECONDARY CONDUIT FORMATIONS 3.5"	MAX NO. (23)	4"	MAX NO. (23)	REINFORCING (BARS BOTH WAYS)	ESTIMATING DATA REINFORCING BARS (FT)	CONCRETE (CU YD)
.B	45	225	208/120	6'-0"	5'-6"	6"	4"	14"	14"		4		4	#3 BARS 5" C.C.	156	.54
.C	112.5	300	208/120	6'-0"	5'-6"	6"	4"	14"	18"		6		6	#3 BARS 5" C.C.	159	.53
.D	225	500	208/120	7'-0"	6'-6"	6"	4"	18"	18"		9		9	#3 BARS 4" C.C.	259	.74
.E	750	750	208/120	7'-0"	6'-6"	6"	4"	18"	26.5"		16		12	#4 BARS 6" C.C.	174	.68
.F	45	75	480/277	5'-0"	5'-6"	6"	4"	14"	14"		4		4	#2 BARS 4" C.C.	142	.39
.G	112.5	300	480/277	6'-0"	5'-6"	6"	4"	14"	18"		6		6	#3 BARS 5" C.C.	159	.53
.H	225	1000	480/277	6'-0"	7'-0"	7"	4"	18"	18"		9		9	#4 BARS 5" C.C.	266	.94
.J	1500	2500	480/277	8'-6"	8'-6"	8"	4"	18"	26.5"		16		12	#4 BARS 5" C.C.	330	1.64
.K	500	750	4kV	7'-0"	6'-0"	6"	10"	8"	10"		2		2	#4 BARS 5" C.C.	196	.70
.L	1000	2500	4kV	8'-0"	8'-0"	8"	6"	14"	14"		4		4	#4 BARS 5" C.C.	292	1.51

Exelon. Energy Delivery · SYSTEM STANDARD

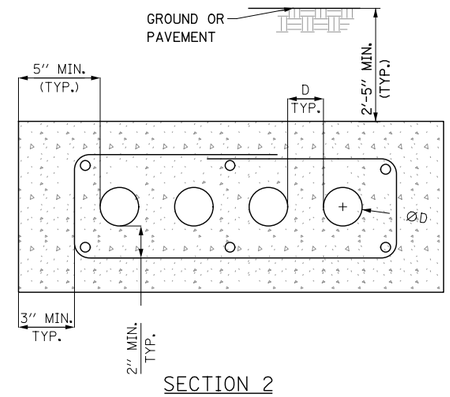




GROUND ROD AND ACCESS BOX DETAIL
NOT TO SCALE



SECTION 1
TYPICAL REINFORCING FOR CONCRETE ENCASED DUCT
NOT TO SCALE



SECTION 2
NOT TO SCALE

E25

KNIGHT Engineers & Architects	USER NAME = cliss	DESIGNED PNS	REVISED -
		DRAWN MB	REVISED -
	PLOT SCALE = 1:2	CHECKED JWM	REVISED -
	PLOT DATE = 6/25/2020	DATE 06/26/20	REVISED -

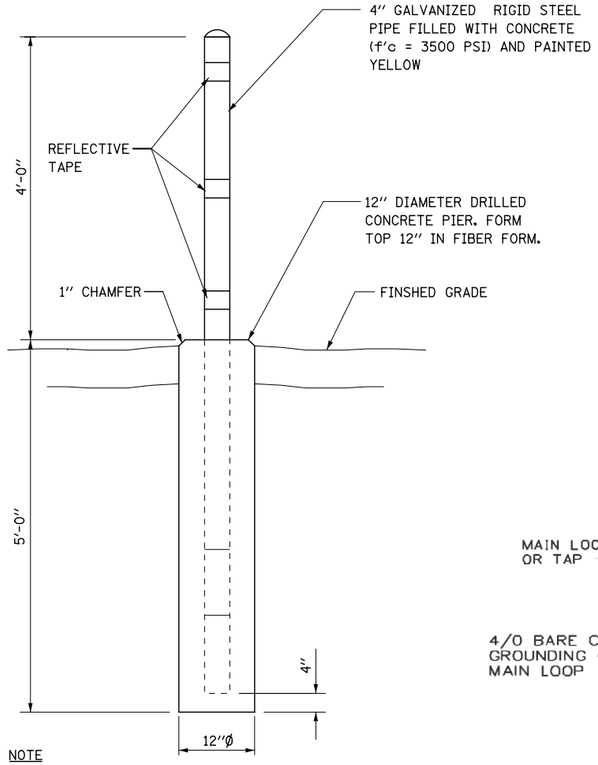
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ELECTRICAL DETAILS
PUMP STATION 38

SCALE: | SHEET 1 OF 2 SHEETS | STA. | TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	262
		CONTRACT NO. 62B65		
		ILLINOIS FED. AID PROJECT		

FILE NAME = L:\7295\CAD\Sheets\Building\Electrical\Pump Station 38 - Electrical Drawings\ELECTRICAL 25 DETAILS 1.dgn



NOTE

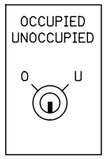
SEE SHEET E3 FOR NUMBER OF BOLLARDS AND SPACING.

PIPE BOLLARD DETAIL

NOT TO SCALE

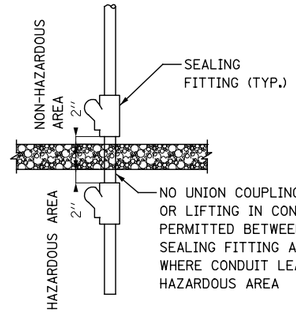
VENTILATION RUNNING LIGHT DETAIL

NOT TO SCALE



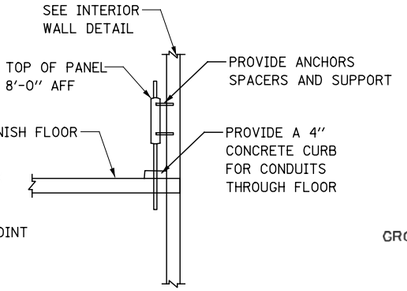
''UNOCCUPIED - OCCUPIED'' KEY SWITCH

NOT TO SCALE



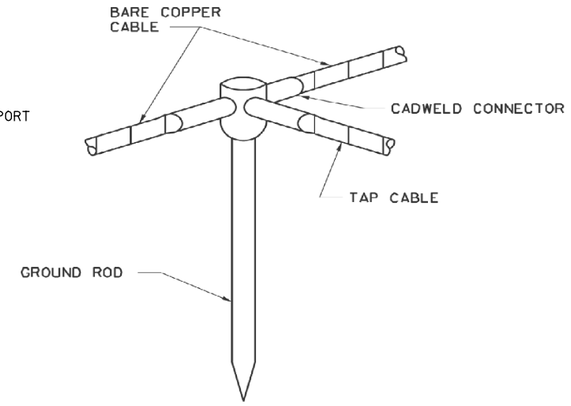
CONDUIT SEALING DETAIL

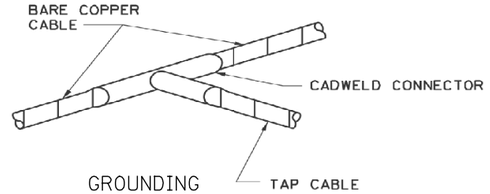
NOT TO SCALE



WALL MOUNT PANEL DETAIL

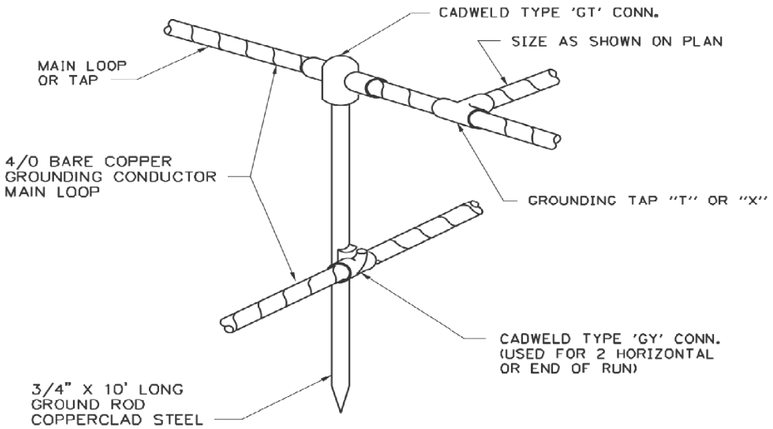
NOT TO SCALE





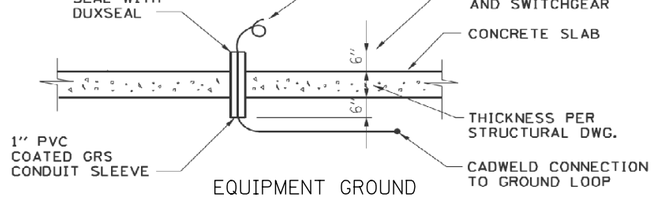
GROUNDING CONNECTION DETAIL

NOT TO SCALE



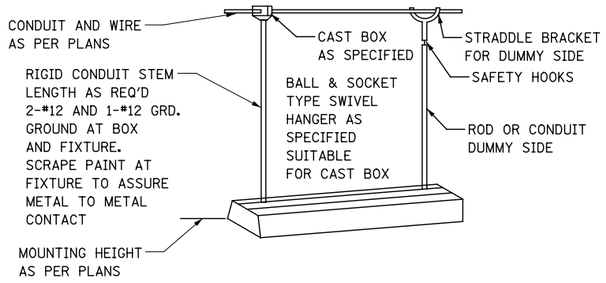
CONDUCTOR TO GROUND ROD CONNECTION DETAIL

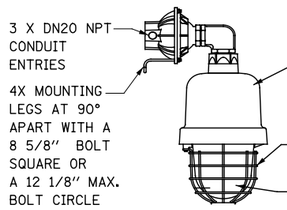
NOT TO SCALE



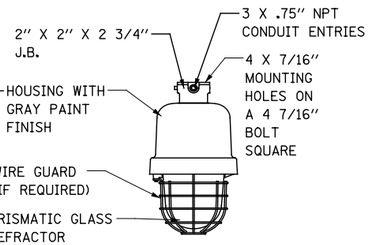
EQUIPMENT GROUND CABLE STUB-UP

NOT TO SCALE

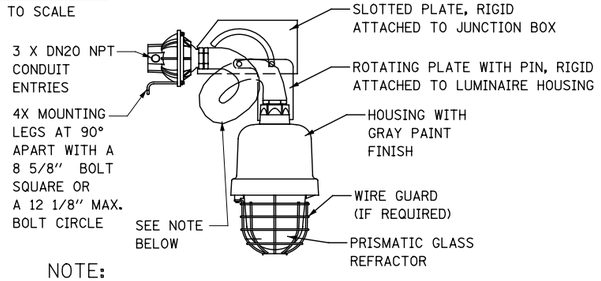




WALL MOUNT



CEILING MOUNT RIGID



NOTE:

CONNECTION BETWEEN LIGHT FIXTURE AND JUNCTION BOX ASSOCIATED ATTACHED TO LATERAL LANDING SHALL BE MADE THROUGH LIQUID TIGHT FLEXIBLE METALLIC CONDUIT TO MEET CLASS I DIV 2 GROUP D REQUIREMENTS.

SIDE LANDING MOUNT BALL SOCKET

TYPICAL LED LIGHT FIXTURE INSTALLATION

NOT TO SCALE

FILE NAME = L:\7395\CADD\Sheets\Building\Electrical\Pump Station 38 - Electrical Drawings\ELECTRICAL 26 DETAILS 2.dgn

KNIGHT Engineers & Architects

USER NAME = cliss	DESIGNED PNS	REVISED -
	DRAWN MB	REVISED -
PLOT SCALE = 1:2	CHECKED JWM	REVISED -
PLOT DATE = 6/25/2020	DATE 06/26/20	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ELECTRICAL DETAILS
PUMP STATION 38

SCALE: | SHEET 2 OF 2 SHEETS | STA. | TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	263
		CONTRACT NO. 62B65		
		ILLINOIS	FED. AID PROJECT	

LIGHTING FIXTURE SCHEDULE

TYPE	MANUFACTURER	CATALOG NUMBER	VOLT	LAMPS NO.	LAMPS WATTS	LAMPS TYPE	MOUNTING	NO. OF FIXT.	DESCRIPTION
A	CREE NEWSTAR WILL	WS4 60L-LFA-40K-8-UL NSUN4-L2-40-1-AC-UN 96-L62/940-HIAFR-DRV-UNV	120	-	50	LED	SURFACE	10	LED FIXTURE LISTED FOR DAMP LOCATIONS, POLYESTER HOUSING, ACRYLIC GASKETED DIFFUSER WITH CAPTIVE LATCHES
C	HOLOPHANE LARSON ELECTRONICS SPECGRADE	HPLED 84 700 4K AS UN G L5 45C GD EPL-HB-150LED-SFC EXP-65W-5000K-110-V01-GR-PD01	120	-	150	LED	SURFACE CEILING	19	EXPLOSION PROOF LED FIXTURE SUITABLE FOR CLASS I, DIV. 2, GROUP D LOCATION, COPPER FREE ALUMINUM BALLAST BODY
C1	HOLOPHANE LARSON ELECTRONICS SPECGRADE	HPLED 84 700 4K AS US G L5 45C GD EPL-HB-150LED-SFC EXP-65W-5000K-110-V01-GR-WL90	120	-	150	LED	WALL	7	EXPLOSION PROOF LED FIXTURE SUITABLE FOR CLASS I, DIV. 2, GROUP D LOCATION, COPPER FREE ALUMINUM BALLAST BODY, WALL MOUNTED
D	CREE WILL HE WILLIAMS LIGHTING	C-WP-A-TRIAD-4L-50K-DB WP1-L44/850-DIM-UNV VWP H-L30/740-T3-BLK-CGL-EM/10WC-UNV	120	-	48	LED	WALL	6	WALL PACK LED OUTDOOR FIXTURE, DIE CAST ALUMINUM HOUSING, FULL CUTOFF NOTE: CONTROLLED VIA TIME RELAY
E	EATON/CROUSE-HINDS LITHONIA LIGHTING LARSON ELECTRONICS	UX71WHSDHAZ LZS 1R ELN SD EXP-EMG-EXT-LED10W-R-V2	120	-	10	LED	WALL	6	EXPLOSION PROOF EXIT SIGN SUITABLE FOR CLASS I, DIV. 2, GROUP D LOCATIONS, HIGH INTENSITY LED, COPPER FREE ALUMINUM HOUSING AND 90 MIN. BATTERY BACKUP TIME
E1	EATON/CROUSE-HINDS HE WILLIAMS LIGHTING SURE-LITES	UX71WHSD EXIT-R-EM-WHT-SDT-D APLX7RG	120	-	3.8	LED	WALL	2	LED LIT EXIT SIGN, WALL MOUNTED, SINGLE FACE, RED LETTERS ON WHITE BACKGROUND AND 90 MIN. BATTERY BACKUP TIME
F	EATON/CROUSE-HINDS LARSON ELECTRONICS THE LIGHTING SOURCE	N2LPSM212222 HAL-EMG-2X3W-2L EXP-12-36WSLA-LED MR16 5W AT	120	-	36	LED	WALL	11	EMERGENCY BATTERY BACKUP WITH 2 LED HEADS SUITABLE FOR CLASS I, DIV. 2, GROUP D LOCATIONS AND 90 MIN. BATTERY BACKUP TIME
F1	H. E. WILLIAMS LITHONIA LIGHTING SURE LITES	EMER/LED-WHT-HL-SDT-D EU2C SD APLEL	120	-	1.6	LED	WALL	3	EMERGENCY BATTERY BACKUP WITH 2 LED HEADS WITH 90 MIN. BATTERY BACKUP TIME

PANEL LP-38

VOLTAGE 208 PHASE 3 WIRE 4 TOTAL WATTS: 23000 W AØ Amps: 21.0 A BØ Amps: 21.5 A CØ Amps: 21.4 A

MAIN 100 A CB PANEL MOU 0 TOTAL AMPS: 63.9 A PHASE A: 7,539.0 W PHASE B: 7,745.0 W PHASE C: 7,716.0 W

CIRCUIT USE	LOAD		CCT		CCT		LOAD	CIRCUIT USE
LIGHTS DRY WELL	780	20A/1P	1	2		20A/1P	1,012	LIGHTS WET WELL
LIGHTS DRY WELL	840	20A/1P	3	4		20A/1P	1,129	LIGHTS WET WELL
LIGHTS ELECTRICAL ROOM	216	20A/1P	5	6		20A/1P	60	OUTSIDE LIGHTING THROUGH TIMER
LIGHTS ELECTRICAL ROOM	216	20A/1P	7	8		20A/1P	60	OUTSIDE LIGHTING THROUGH TIMER
LIT-009	60	20A/1P	9	10		20A/1P	1,440	RECEPTACLES DRY/WETWELL EXT
LIT-007A	60	20A/1P	11	12		20A/1P	720	RECEPTACLES ELECTRICAL ROOM
SPARE		30A/1P	13	14		20A/1P	696	EF-4
SPARE		20A/1P	15	16		20A/1P	480	GAS MONITORING PANEL
SPARE		20A/1P	17	18		20A/1P	60	LIT-011
FIRE ALARM PANEL	480	20A/1P	19	20		20A/1P	60	LIT-007B
SPARE		20A/1P	21	22		20A/1P		SPARE
SPARE		20A/1P	23	24		30A/1P	3,000	UPS
NETWORK RACK	2,000	20A/1P	25	26		20A/1P		SPARE
SUMP PUMP CONTROL PANEL	600		27	28		20A/1P	250	EXTERIOR LIGHTING CONTROLLER
	600	20A/2P	29	30		20A/1P	1000	SCADA POWER TRAIN 1
GDP-38	2,235		31	32		20A/1P		SPARE
	1,946	60A/3P	33	34		20A/1P	1000	SCADA POWER TRAIN 2
	2,000		35	36		A/ P		
		A/ P	37	38		A/ P		
		A/ P	39	40		A/ P		
		A/ P	41	42		A/ P		

PANEL GDP-38

VOLTAGE 208 PHASE 3 WIRE 4 TOTAL WATTS: 6181 W AØ Amps: 6.2 A BØ Amps: 5.4 A CØ Amps: 5.6 A

MAIN 60 A CB WALL MOU 0 TOTAL AMPS: 17.2 A PHASE A: 2,235.0 W PHASE B: 1,946.0 W PHASE C: 2,000.0 W

CIRCUIT USE	LOAD		CCT		CCT		LOAD	CIRCUIT USE
LIGHTS GEN ROOM	325	20A/1P	1	2		20A/2P	1,250	GENERATOR BLOCK HEATER
EF-3	696	20A/1P	3	4			1,250	
CONVENIENCE OUTLETS	1,000	20A/1P	5	6		20A/1P	1,000	CONVENIENCE OUTLETS
BATTERY CHARGER	360	20A/1P	7	8		20A/1P	300	OIL SUMP HEATER
SPARE		20A/1P	9	10		20A/1P		SPARE
SPARE		20A/1P	11	12		20A/1P		SPARE
SPARE		20A/1P	13	14		A/ P		SPARE
SPACE		A/ P	15	16		A/ P		SPACE
SPACE		A/ P	17	18		A/ P		SPACE
SPACE		A/ P	19	20		A/ P		SPACE
SPACE		A/ P	21	22		A/ P		SPACE
SPACE		A/ P	23	24		A/ P		SPACE

LOAD SIZING SCHEDULE

ITEM	I.D.	HORSE POWER	V/Ph (60Hz)	WATTS	F.L.A.	MAX CURRENT AMPS	DISC. TAG	DISC. RATING	BREAKER RATING
1	MP-1	70	480/3	52220	62.8	78.5	DS1	200A-3P	125A-3P
2	EF-1	3	480/3	2238	2.7	3.4	DSEF-1	15A-3P	15A-3P
3	MP-2	70	480/3	52220	62.8	78.5	DS2	200A-3P	125A-3P
4	EF-2	3	480/3	2238	2.7	3.4	DSEF-2	15A-3P	15A-3P
5	MP-3	70	480/3	52220	62.8	78.5	DS3	200A-3P	125A-3P
6	SF-1	3	480/3	2238	2.7	3.4	DSSF-1	15A-3P	15A-3P
7	SF-3	0.75	480/3	559.5	0.7	0.8	DSSF-3	15A-3P	15A-3P
8	LFP	20	480/3	14920	18.0	22.4	DS4	60A-3P	60A-3P
9	SF-2	3	480/3	2238	2.7	3.4	DSSF-2	15A-3P	15A-3P
10	EUH-1	-	480/3	5000	6.0	7.5	DSEUH-1	15A-3P	15A-3P
11	EUH-2	-	480/3	5000	6.0	7.5	DSEUH-2	15A-3P	15A-3P
12	EUH-3	-	480/3	3000	3.6	4.5	DSEUH-3	15A-3P	15A-3P
13	EUH-4	-	480/3	7500	9.0	11.3	DSEUH-4	30A-3P	30A-3P
14	EUH-5	-	480/3	7500	9.0	11.3	DSEUH-5	30A-3P	20A-3P
15	EUH-6	-	480/3	3000	3.6	4.5	DSEUH-6	15A-3P	15A-3P
16	EUH-7	-	480/3	3000	3.6	4.5	DSEUH-7	15A-3P	15A-3P
17	H-1	3.5	480/3	2611	3.1	3.9	DSH1	15A-3P	15A-3P

KNIGHT Engineers & Architects

USER NAME = cliss	DESIGNED PNS	REVISED -
	DRAWN MB	REVISED -
PLOT SCALE = 1:2	CHECKED JWM	REVISED -
PLOT DATE = 6/25/2020	DATE 06/26/20	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ELECTRICAL SCHEDULES
PUMP STATION 38

SCALE: | SHEET 1 OF 1 SHEETS | STA. | TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	264
		CONTRACT NO. 62B65		
	ILLINOIS FED. AID PROJECT			

POWER CONDUIT						
NUMBER	SIZE (IN.)	TYPE	CONDUCTOR QUANTITY AND SIZE (AWG-kcmil)	COND./CABLE INSULATION	FROM	TO
P1	4	PVC	4-500kcmil & 1-#3 GND	XHHW-2	SERVICE TRANSFORMER	METER ENCLOSURE (SERVICE)
P1A	4	PVCC RGS	4-500kcmil & 1-#3 GND	XHHW-2	METER ENCLOSURE (SERVICE)	DS-1
P1B	4	PVCC RGS	4-500kcmil & 1-#3 GND	XHHW-2	DS-1	MCC-P38 (CUBICLE 1A)
P2	4	PVC	4-500kcmil & 1-#3 GND	XHHW-2	GENERATOR DISCONNECT	MCC-P38 (CUBICLE 1B)
P3A	2 1/2	PVCC RGS	BY VENDOR (NOTE 1)	-	MCC-P38 (CUBICLE 3A)	200A DISCONNECT FOR MP-1
P3B	3/4	PVCC RGS	3-#12 & 1-#12 GND	THWN	MCC-P38 (CUBICLE 3B)	15A DISCONNECT FOR EF-1
P3B1	3/4	PVCC RGS	3-#12 & 1-#12 GND	THWN	15A DISCONNECT	EXHAUST FAN EF-1
P4A	2 1/2	PVCC RGS	BY VENDOR (NOTE 1)	-	MCC-P38 (CUBICLE 4A)	200A DISCONNECT FOR MP-2
P4B	3/4	PVCC RGS	3-#12 & 1-#12 GND	THWN	MCC-P38 (CUBICLE 4B)	15A DISCONNECT FOR EF-2
P4B1	3/4	PVCC RGS	3-#12 & 1-#12 GND	THWN	15A DISCONNECT	EXHAUST FAN EF-2
P5A	2 1/2	PVCC RGS	BY VENDOR (NOTE 1)	-	MCC-P38 (CUBICLE 5A)	200A DISCONNECT FOR MP-3
P5B	3/4	PVCC RGS	3-#12 & 1-#12 GND	THWN	MCC-P38 (CUBICLE 5B)	15A DISCONNECT FOR SF-1
P5B1	3/4	PVCC RGS	3-#12 & 1-#12 GND	THWN	15A DISCONNECT	SUPPLY FAN SF-1
P5C	3/4	RGS	3-#12 & 1-#12 GND	THWN	MCC-P38 (CUBICLE 5C)	15A DISCONNECT FOR SF-3
P5C1	3/4	RGS	3-#12 & 1-#12 GND	THWN	15A DISCONNECT	SUPPLY FAN SF-3
P6A	2 1/2	PVCC RGS	BY VENDOR (NOTE 1)	-	MCC-P38 (CUBICLE 6A)	60A DISCONNECT FOR LFP
P6B	3/4	PVCC RGS	3-#12 & 1-#12 GND	THWN	MCC-P38 (CUBICLE 6B)	15A DISCONNECT FOR SF-2
P6B1	3/4	PVCC RGS	3-#12 & 1-#12 GND	THWN	15A DISCONNECT	SUPPLY FAN SF-2
P7A	3/4	PVCC RGS	3-#12 & 1-#12 GND	THWN	MCC-P38 (CUBICLE 7A)	15A DISCONNECT FOR EUH-1
P7A1	3/4	PVCC RGS	3-#12 & 1-#12 GND	THWN	15A DISCONNECT	EUH-1
P7B	3/4	PVCC RGS	3-#12 & 1-#12 GND	THWN	MCC-P38 (CUBICLE 7B)	15A DISCONNECT FOR EUH-2
P7B1	3/4	PVCC RGS	3-#12 & 1-#12 GND	THWN	15A DISCONNECT	EUH-2
P7C	3/4	PVCC RGS	3-#12 & 1-#12 GND	THWN	MCC-P38 (CUBICLE 7C)	15A DISCONNECT FOR EUH-3
P7C1	3/4	PVCC RGS	3-#12 & 1-#12 GND	THWN	15A DISCONNECT	EUH-3
P7D	3/4	RGS	3-#12 & 1-#12 GND	THWN	MCC-P38 (CUBICLE 7D)	15A DISCONNECT FOR EUH-4
P7D1	3/4	RGS	3-#12 & 1-#12 GND	THWN	15A DISCONNECT	EUH-4
P7E	3/4	RGS	3-#12 & 1-#12 GND	THWN	MCC-P38 (CUBICLE 7E)	15A DISCONNECT FOR EUH-5
P7E1	3/4	RGS	3-#12 & 1-#12 GND	THWN	15A DISCONNECT	EUH-5
P7F	3/4	PVCC RGS	3-#12 & 1-#12 GND	THWN	MCC-P38 (CUBICLE 7F)	15A DISCONNECT FOR EUH-6
P7F1	3/4	PVCC RGS	3-#12 & 1-#12 GND	THWN	15A DISCONNECT	EUH-6
P7G	3/4	PVCC RGS	3-#12 & 1-#12 GND	THWN	MCC-P38 (CUBICLE 7G)	15A DISCONNECT FOR EUH-7
P7G1	3/4	PVCC RGS	3-#12 & 1-#12 GND	THWN	15A DISCONNECT	EUH-7
P7H	3/4	PVCC RGS	3-#12 & 1-#12 GND	THWN	MCC-P38 (CUBICLE 7H)	15A DISCONNECT FOR BRIDGE CRANE
P7H1	3/4	PVCC RGS	3-#12 & 1-#12 GND	THWN	15A DISCONNECT	BRIDGE CRANE
P8A	3/4	PVCC RGS	3-#8 & 1-#10 GND	THWN	MCC-P38 (CUBICLE 8A)	MCC-P38 (TRANSFORMER T-38)
P8A1	1 1/4	PVCC RGS	4-#2 & 1-#8 GND	THWN	MCC-P38 (T-38)	MCC-P38 (PANEL LP-38)
P8A2	2	PVCC RGS	4-#6 & 1-#10 GND	THWN	MCC-P38 (PANEL LP-38)	GENERATOR DISTRIBUTION PANEL
P9	3/4	PVCC RGS	3-#12 & 1-#12 GND	THWN	CP-SP1	SP-1 DISCONNECT
P10	3/4	PVCC RGS	2-#12 & 1-#12 GND	THWN	PNL LP-38	GAS MONITORING SYSTEM
P11	3/4	PVCC RGS	2-#12 & 1-#12 GND	THWN	PNL LP-38	NETWORK RACK
P12	3/4	PVCC RGS	2-#12 & 1-#12 GND	THWN	PNL LP-38	FIRE ALARM SYSTEM (FACP)
P13	3/4	PVCC RGS	4-#12 & 1-#12 GND	THWN	PNL LP-38	SUMP PUMP CONTROL PNL (CP-SP)
P14	4	PVC	SPARE		SERVICE TRANSFORMER	SERVICE ENTRANCE
P15	4	PVC	SPARE		GENERATOR DISCONNECT	SERVICE ENTRANCE
P21	3/4	PVCC RGS	2-#12 & 1-#12 GND	THWN	EF-4 CONTROL BOX	EF-4
P22	3/4	PVCC RGS	4-#12 & 1-#12 GND	THWN	MCC-P38 (PANEL LP-38)	SCADA PANEL SP-38
P23	3/4	PVCC RGS	2-#12 & 1-#12 GND	THWN	MCC-P38 (PANEL LP-38)	LIT-007A
P24	3/4	PVCC RGS	2-#12 & 1-#12 GND	THWN	MCC-P38 (PANEL LP-38)	LIT-007B
P25	3/4	PVCC RGS	2-#12 & 1-#12 GND	THWN	MCC-P38 (PANEL LP-38)	LIT-009
P26	3/4	PVCC RGS	2-#12 & 1-#12 GND	THWN	MCC-P38 (PANEL LP-38)	LIT-011
P27	3/4	PVCC RGS	5-#12 & 1-#12 GND	THWN	MCC-P38 (PANEL LP-38)	EXTERIOR LIGHTING CONTROL BOX
P28	3/4	PVCC RGS	2-#12 & 1-#12 GND	THWN	MCC-P38 (PANEL LP-38)	EF-4 CONTROL BOX
P29	3/4	PVCC RGS	2-#12 & 1-#12 GND	THWN	MCC-P38 (PANEL LP-38)	LIT-010

NOTE:

1. VENDOR CABLE INCLUDES POWER AND MONITORING CABLES.

CONTROL CONDUIT						
NUMBER	SIZE (IN.)	TYPE	CONDUCTOR QUANTITY AND SIZE (AWG-kcmil)	COND./CABLE INSULATION	FROM	TO
C1	1	CNC	2-#12 & 1-#12 GND	THWN	SP-38	ROAD FLOOD SENSOR JB
C2	3/4	PVCC RGS	3-#12 & 1-#12 GND	THWN	MD-8	JB12
C3	3/4	PVCC RGS	3-#12 & 1-#12 GND	THWN	MD-7	EF-4 CONTROL BOX
C3A1	3/4	PVCC RGS	12-#12 & 1-#12 GND	THWN	MCC-P38 (CUBICLE 3A)	MP-1 CONTROL STATION
C3B1	3/4	PVCC RGS	5-#12 & 1-#12 GND	THWN	MCC-P38 (CUBICLE 3B)	MD-1
C4	3/4	PVCC RGS	3-#12 & 1-#12 GND	THWN	EF-4 CONTROL STATION	JB12
C4A1	3/4	PVCC RGS	12-#12 & 1-#12 GND	THWN	MCC-P38 (CUBICLE 4A)	MP-2 CONTROL STATION
C4B2	3/4	PVCC RGS	3-#12 & 1-#12 GND	THWN	MCC-P38 (CUBICLE 4B)	MD-3
C5A1	3/4	PVCC RGS	12-#12 & 1-#12 GND	THWN	MCC-P38 (CUBICLE 5A)	MP-3 CONTROL STATION
C5B2	3/4	PVCC RGS	3-#12 & 1-#12 GND	THWN	MCC-P38 (CUBICLE 5B)	JB8
C5B3	3/4	PVCC RGS	3-#12 & 1-#12 GND	THWN	JB8	MD-2
C5B5	3/4	PVCC RGS	7-#12 & 1-#12 GND	THWN	JB8	SF-1 CONTROL STATION
C5C2	3/4	RGS	10-#12 & 1-#12 GND	THWN	MCC-P38 (CUBICLE 7I)	JB11
C5C3	3/4	RGS	3-#12 & 1-#12 GND	THWN	JB11	MD-5
C5C5	3/4	RGS	2-#12 & 1-#12 GND	THWN	JB11	SF-3 CONTROL STATION
C5C6	3/4	RGS	2-#12 & 1-#12 GND	THWN	JB11	MD-6
C6	3/4	PVCC RGS	2-#12 & 1-#12 GND	THWN	SCADA PANEL SP-38	WET WELL DOOR
C6A1	3/4	PVCC RGS	12-#12 & 1-#12 GND	THWN	MCC-P38 (CUBICLE 6A)	LFP CONTROL STATION
C6B2	3/4	PVCC RGS	8-#12 & 1-#12 GND	THWN	MCC-P38 (CUBICLE 6B)	JB9
C6B3	3/4	PVCC RGS	3-#12 & 1-#12 GND	THWN	JB9	MD-4
C6B4	3/4	PVCC RGS	3-#12 & 1-#12 GND	THWN	JB9	SF-2 CONTROL STATION
C7	3/4	PVCC RGS	2-#12 & 1-#12 GND	THWN	SCADA PANEL SP-38	EL ROOM NORTH DOOR
C7A2	3/4	PVCC RGS	2-#12 & 1-#12 GND	THWN	THERMOSTAT (EUH-1)	EUH-1
C7B2	3/4	PVCC RGS	2-#12 & 1-#12 GND	THWN	THERMOSTAT (EUH-2)	EUH-2
C7C2	3/4	PVCC RGS	2-#12 & 1-#12 GND	THWN	THERMOSTAT (EUH-3)	EUH-3
C7D2	3/4	RGS	2-#12 & 1-#12 GND	THWN	THERMOSTAT (EUH-4)	EUH-4
C7E2	3/4	RGS	2-#12 & 1-#12 GND	THWN	THERMOSTAT (EUH-5)	EUH-5
C7F2	3/4	PVCC RGS	2-#12 & 1-#12 GND	THWN	THERMOSTAT (EUH-6)	EUH-6
C7G2	3/4	PVCC RGS	2-#12 & 1-#12 GND	THWN	THERMOSTAT (EUH-7)	EUH-7
C8	3/4	PVCC RGS	2-#12 & 1-#12 GND	THWN	SCADA PANEL SP-38	EL ROOM SOUTH DOOR
C9	3/4	PVCC RGS	4-#12 & 1-#12 GND	THWN	SCADA PANEL SP-38	OVERRIDE SWITCHES
C10	3/4	PVCC RGS	4-#12 & 1-#12 GND	THWN	SCADA PANEL SP-38	PB-1
C11	3/4	PVCC RGS	2-#12 & 1-#12 GND	THWN	PB-1	DRY WELL DBLE DOOR (LEFT DOOR)
C12	3/4	PVCC RGS	2-#12 & 1-#12 GND	THWN	PB-1	DRY WELL DBLE DOOR (RIGHT DOOR)
C13	3/4	PVCC RGS	4-#12 & 1-#12 GND	THWN	FIRE ALARM CONTROL PANEL	PLC IN SCADA PANEL SP38
C14	3/4	PVCC RGS	6-#14 & 1-#14 GND	THWN	SP1 FLOAT SWITCHES	CONTROL STATION CS-SP1
C15	3/4	PVCC RGS	6-#14 & 1-#14 GND	THWN	SUMP PUMP CP-SP1 PANEL	CONTROL STATION CS-SP1
C16	3/4	PVCC RGS	6-#12 & 1-#12 GND	THWN	GAS MONIT. CONTROL PNL	PLC IN SCADA PANEL SP38
C17	3/4	PVCC RGS	2-#12 & 1-#12 GND	THWN	GAS MONIT. CONTROL PNL	MCC-P38 (CUBICLE 5B)
C18	3/4	PVCC RGS	2-#12 & 1-#12 GND	THWN	GAS MONIT. CONTROL PNL	MCC-P38 (CUBICLE 6B)
C21	3/4	PVCC RGS	24VDC; 4-20mADC, 600Ω CABLE	THWN	GAS MONIT. CONTROL PNL	GAS SENSOR IN DISCH. CHAMBER
C22	3/4	PVCC RGS	24VDC; 4-20mADC, 600Ω CABLE	THWN	GAS MONIT. CONTROL PNL	GAS SENSOR IN DRY WELL
C23	3/4	PVCC RGS	24VDC; 4-20mADC, 600Ω CABLE	THWN	GAS MONIT. CONTROL PNL	GAS SENSOR IN WET WELL
C24	3/4	PVCC RGS	2-#12 & 1-#12 GND	THWN	GM1	EF-4 CONTROL BOX
C26	3/4	PVCC RGS	2-#12 & 1-#12 GND	THWN	EF-4 CONTROL BOX	WET WELL LIGHTING SWITCH
C27	3/4	PVCC RGS	6-#12 & 1-#12 GND	THWN	SUMP PUMP CP-SP1 PANEL	SCADA PANEL SP38
C28	2	PVCC RGS	N/A	N/A	NETWORK RACK	FIBER OPTIC JB
C29	3/4	PVCC RGS	2-#12 & 1-#12 GND	THWN	SCADA PANEL SP-38	GENERATOR BLDG DOOR
C30	3/4	PVCC RGS	2-#12 & 1-#12 GND	THWN	SCADA PANEL SP-38	GENERATOR BLDG ROLL-UP DOOR
C31	3/4	PVCC RGS	2-#12 & 1-#12 GND	THWN	SCADA PANEL SP-38	KS-1
C32	3/4	RGS	2-#12 & 1-#12 GND	THWN	EF-4 CONTROL BOX	MCC-P38 (CUBICLE 6B)
C33	3/4	RGS	4-#12 & 1-#12 GND	THWN	GM1	FACP
C34	3/4	RGS	2-#12 & 1-#12 GND	THWN	WET WELL VENTIL RUN LIGHT	WET WELL LIGHTING SWITCH
C35	3/4	RGS	2-#12 & 1-#12 GND	THWN	DRY WELL VENTIL RUN LIGHT	DRY WELL LIGHTING SWITCH
C36	3/4	RGS	2-#12 & 1-#12 GND	THWN	MCC-P38 (CUBICLE 6A)	WET WELL LIGHTING SWITCH
C37	3/4	RGS	2-#12 & 1-#12 GND	THWN	MCC-P38 (CUBICLE 5B)	DRY WELL LIGHTING SWITCH
C38	3/4	RGS	2-#12 & 1-#12 GND	THWN	MCC-P38 (CUBICLE 5C)	ELECTRICAL ROOM LIGHTING SWITCH
C39	3/4	RGS	2-#12 & 1-#12 GND	THWN	MCC-P38 (CUBICLE 5B)	FACP
C40	3/4	RGS	2-#12 & 1-#12 GND	THWN	MCC-P38 (CUBICLE 6A)	FACP
C41	3/4	RGS	2-#12 & 1-#12 GND	THWN	MCC-P38 (CUBICLE 5C)	FACP
C42	3/4	RGS	2-#12 & 1-#12 GND	THWN	EF-4 CONTROL BOX	FACP

FILE NAME = L:\7955\CAD\Sheets\Building\Electrical\Pump Station 38 - Electrical Drawings\ELECTRICAL 28 CONG & CABLE SCHED.dgn

KNIGHT
Engineers & Architects

USER NAME = cliss	DESIGNED PNS	REVISED -
	DRAWN MB	REVISED -
PLOT SCALE = 1:2	CHECKED JWM	REVISED -
PLOT DATE = 6/25/2020	DATE 06/26/20	REVISED -

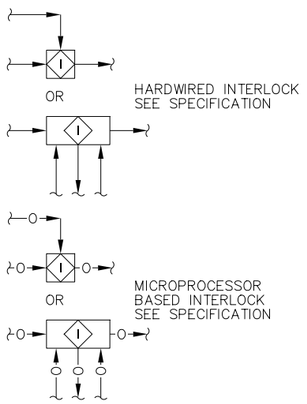
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

CONDUIT AND CABLE SCHEDULE
PUMP STATION 38

SCALE: | SHEET 1 OF 1 SHEETS | STA. | TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	265
		CONTRACT NO. 62B65		
	ILLINOIS FED. AID PROJECT			

MISCELLANEOUS SYMBOLS



HARDWIRED INTERLOCK SEE SPECIFICATION

MICROPROCESSOR BASED INTERLOCK SEE SPECIFICATION

BLIND FLANGE OR CLEAN OUT

AIR GAP

STRAINER

FLUSHING WATER CONNECTION

SEAL WATER CONNECTION

EJECTOR

AUTOMATIC SAMPLER

DIFFUSER

VENT

RUPTURE DISK

SELF CONTAINED AIR SUPPLY

PURGE SET
X: W – WATER
A – AIR

120 VOLT, 60 HZ POWER SUPPLY POINT

MIXER WITH ELECTRIC MOTOR

ELECTRIC MOTOR

MANUAL SAMPLE PORT

AUTOMATIC DRAIN

MANUAL DRIP TRAP

DIAPHRAGM SEAL

ANNULAR SEAL

FLOW STRAIGHTENING VANE

CALIBRATION CHAMBER

INSTRUMENTATION GROUND

LEVEL ELEMENT, ULTRASONIC, SUSPENDED, NON–INTRUSIVE

LEVEL ELEMENT, HYDROSTATIC, SUSPENDED, SUBMERSIBLE

FLOAT SWITCH

I & C CABLE

I & C CABLE WITHIN THE VENDOR SUPPLIED CABLE, BUNDLE WITH POWER CABLE

VALVE SYMBOLS

KNIFE GATE

MUD

PUMP SYMBOLS

SUBMERSIBLE PUMP

NOTE: XX= AS= ADJUSTABLE SPEED
CS–1= CONSTANT SPEED (SINGLE SPEED)
CS–2= CONSTANT SPEED (TWO SPEED)

INPUTS & OUTPUTS TO PLC OR DISTRIBUTED CONTROL

ANALOG INPUT

PULSE INPUT

ANALOG OUTPUT

PULSE OUTPUT

DIGITAL OUTPUT

ANALOG INPUT

RELAY OUTPUT

DIGITAL INPUT

DIGITAL OUTPUT

NOTE: X= TOTAL NUMBER OF SIGNALS WHERE MORE THAN ONE SIGNAL IS REQUIRED. IF QUANTITY IS NOT SHOWN, THEN ONE SIGNAL IS REQUIRED.

WIRING DIAGRAM SYMBOLS & EXAMPLE

◊ TERMINAL IN SCADA PANEL (SP38)

△ TERMINAL IN MOTOR STARTER OR OTHER MISCELLANEOUS EQUIPMENT AS IDENTIFIED BY TERMINAL BLOCK DESIGNATION

EXAMPLE:

ABBREVIATIONS

ATS	AUTOMATED TRANSFER SWITCH
BKR	BREAKER
CS	CONTROL SWITCH
EF	EXHAUST FAN
FACP	FIRE ALARM CONTROL PANEL
GM	GAS MONITORING
IG	ISOLATED GROUND
LFP	LOW FLOW PUMP
MCC	MOTOR CONTROL CENTER
PMPR	PUMP OVERRIDE
RGS	RIGID GALVANIZED STEEL
SF	SUPPLY FAN
SP	SCADA PANEL

GENERAL NOTES:

1. THIS IS A STANDARD LEGEND. NOT ALL OF THE INFORMATION SHOWN ON THIS LEGEND IS USED IN THESE CONTRACT DRAWINGS.

IC1

FILE NAME = L:\7355\CADD\Sheets\Building\I&C\7355-PS38-IC1.dgn

KNIGHT Engineers & Architects

USER NAME = cliss	DESIGNED PNS	REVISED -
	DRAWN RAM	REVISED -
PLOT SCALE = 1:0.166667	CHECKED JWM	REVISED -
PLOT DATE = 6/25/2020	DATE 06/26/20	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

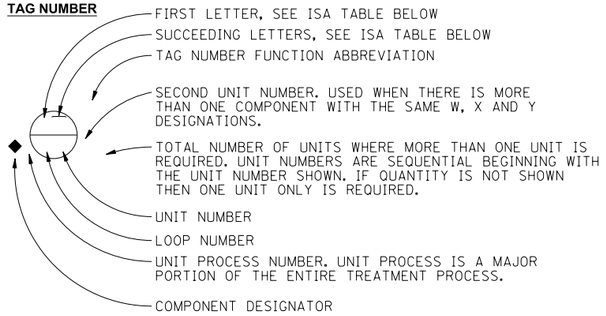
I & C SYMBOL LIST, ABBREVIATIONS & GENERAL NOTES
PUMP STATION 38

SCALE: | SHEET OF 1 SHEETS | STA. | TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	266
		CONTRACT NO. 62B65		
	ILLINOIS	FED. AID PROJECT		

INSTRUMENT IDENTIFICATION

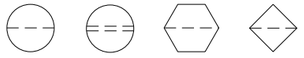
TAG NUMBER



EXAMPLE SYMBOLS

	CONTROL PANEL MOUNTED ACCESSIBLE TO OPERATOR	FIELD MOUNTED	MCC/MOTOR STARTER MOUNTED NORMALLY ACCESSIBLE TO OPERATOR
DISCRETE INSTRUMENTS			
MICROPROCESSOR BASED SHARED INSTRUMENT			
COMPUTER FUNCTION		NONE	NONE

INACCESSIBLE OR BEHIND-THE-PANEL DEVICES OR FUNCTIONS MAY BE DEPICTED BY USING THE SAME SYMBOLS BUT WITH DASHED HORIZONTAL BARS, I.E.



TAG NUMBER FUNCTION ABBREVIATIONS

ALT	ALTERNATE
AM	AMMETER
AS	AMMETER SWITCH
C	CLOSE(D)
CB	CIRCUIT BREAKER
CM	COMPUTER-MANUAL
DIFF	DIFFERENCE OR DIFFERENTIAL
DO	DISSOLVED OXYGEN
F	FAIL
F(X)	CHARACTERIZED
FOR	FORWARD-STOP-REVERSE (MAINTAINED CONTACT)
FSR	FORWARD-STOP-REVERSE (MOMENTARY CONTACT)
GD	GAS DETECTOR
HMI	HUMAN-MACHINE INTERFACE
HOA	HAND-OFF-AUTOMATIC (MAINTAINED CONTACT)
II	CURRENT-TO-CURRENT
IP	CURRENT-TO-PNEUMATIC
ISBR	INTRINSICALLY SAFE BARRIER RELAY
LE	LEVEL EMITTER
LEL	LOWER EXPLOSIVE LIMIT
LIT	LEVEL TRANSMITTER
LL	LEAD-LAG (MAINTAINED CONTACT)
LOR	LOCAL-OFF-REMOTE (MAINTAINED CONTACT)
LOS	LOCKOUT STOP (LOCKABLE IN "STOP" POSITION. MOMENTARY CONTACT)
LR	LOCAL-REMOTE (MAINTAINED CONTACT)
LS	LEVEL SWITCH
LT	LEVEL TRANSDUCER
MA	MANUAL-AUTOMATIC (MAINTAINED CONTACT)
MOA	MANUAL-OFF-AUTOMATIC (MAINTAINED CONTACT)
MTS	MOTOR HIGH TEMPERATURE SWITCH
O	OPEN
OA	OFF-AUTOMATIC
OAC	OPEN-AUTOMATIC-CLOSE (MAINTAINED CONTACT)
OC	OPEN-CLOSE(D) (MAINTAINED CONTACT)
OL	OVERLOAD
OSC	OPEN-STOP-CLOSE (MOMENTARY CONTACT SPRING RETURN TO CENTER POSITION)
OO	ON-OFF (MAINTAINED CONTACT)
OOA	ON-OFF-AUTOMATIC (MAINTAINED CONTACT)
OOR	ON-OFF-REMOTE (MAINTAINED CONTACT)
R	RUN
S	STOP
SP	SPEED POT
SQRT	SQUARE ROOT
SS	START-STOP (MOMENTARY CONTACT)
SSA	START-STOP-AUTOMATIC (MOMENTARY CONTACT)
SSL	START-STOP-LOCK (LOCKABLE IN "STOP" POSITION. MOMENTARY CONTACT)
SUM	SUMMATION
VIB	VIBRATION
X	MULTIPLY
XFER	TRANSFER

INSTRUMENT SOCIETY OF AMERICA TABLE

LETTER	FIRST LETTER (S)		SUCCEEDING LETTERS		
	PROCESS OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS (t)		ALARM		
B	BURNER COMBUSTION		USERS CHOICE (t)	CLOSE, STOP, DECREASE	USERS CHOICE (t)
C	USERS CHOICE (t)			CONTROL	CLOSED
D	USERS CHOICE (t)	DIFFERENTIAL		OPEN, START, INCREASE	
E	VOLTAGE		PRIMARY ELEMENT		
F	FLOW RATE, FIRE				
G	USERS CHOICE (t)		GLASS		FAIL
H	HAND (MANUAL)				HIGH (OPEN)
I	CURRENT		INDICATE		INTERMEDIATE
J	POWER	SCAN			
K	TIME OR SCHEDULE	TIME RATE OF CHANGE		CONTROL STATION	
L	LEVEL		LIGHT (PILOT)		LOW (CLOSED)
M	MOTOR, MOISTURE	MOMENTARY			MIDDLE
N	USERS CHOICE (t)		USERS CHOICE (t)	USERS CHOICE (t)	ON
O	USERS CHOICE (t)		ORIFICE		OPENED
P	PRESSURE OR VACUUM		POINT (TEST CONNECTION)		
Q	QUANTITY	INTEGRATE			
R	RADIOACTIVITY		RECORD OR PRINT		
S	SPEED OR FREQUENCY	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE (t)		MULTIFUNCTION (t)	MULTIFUNCTION (t)	MULTIFUNCTION (t)
V	VIBRATION			VALVE	
W	WEIGHT OR FORCE		WELL		
X	UNCLASSIFIED (t)	X AXIS	UNCLASSIFIED (t)	UNCLASSIFIED (t)	UNCLASSIFIED (t)
Y	EVENT, STATE, OR PRESSURE	Y AXIS		RELAY OR COMPUTE (t)	
Z	POSITION, DIMENSION	Z AXIS		DRIVE, ACTUATE OR UNCLASSIFIED FINAL CONTROL ELEMENT	

(t) WHEN USED, EXPLANATION IS SHOWN ADJACENT TO INSTRUMENT SYMBOL.

SPECIAL CASES:
ELAPSED TIME METER

SIGNALS

DISCRETE (ON/OFF ETC.)

A — MODULATED (4 TO 20 mADC ETC.)

INSTRUMENT SUPPLY OR CONNECTION TO EQUIPMENT

O — O — SOFTWARE OR DATALINK

X — X — FILLED SYSTEM (CAPILLARY TUBING ETC.)

UNDEFINED SIGNAL

PNEUMATIC

L — L — HYDRAULIC

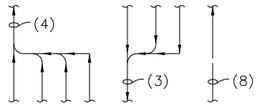
ELECTROMAGNETIC OR SONIC (GUIDED)

ELECTROMAGNETIC OR SONIC (UNGUIDED)

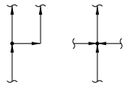
MECHANICAL LINK

E — ETHERNET LINK

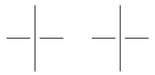
CE — COPPER ETHERNET



PARALLELING LINES. (PARENTHETICAL NUMBER INDICATES THE NUMBER OF SIGNALS REPRESENTED)



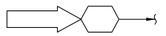
CONNECTING LINES



NON-CONNECTING LINES

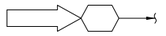
INTERFACE SYMBOLS

PROCESS



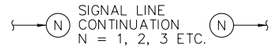
INTER-UNIT PROCESS
W = SOURCE UNIT PROCESS NO.
A = INTERFACE NO.

NNN = SOURCE SHEET NO.
MMM = DESTINATION SHEET NO.



INTRA-UNIT PROCESS
Q = INTERFACE LETTER

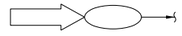
TO INTERFACE
NOT IN CONTRACT



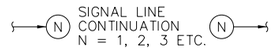
SIGNAL

INTER - UNIT PROCESS
W = SOURCE UNIT PROCESS NO.
A = INTERFACE NO.

NNN = SOURCE SHEET NO.
MMM = DESTINATION SHEET NO.



INTRA-UNIT PROCESS
Q = INTERFACE LETTER



EQUIPMENT IDENTIFICATION

TAG NUMBER

**

D: INSTRUMENTATION TAG, EQUIPMENT ABBREVIATION

W: UNIT PROCESS NUMBER

X: LOOP NUMBER

Y: UNIT NUMBER

** COMPONENT DESIGNATOR

EQUIPMENT ABBREVIATIONS

M	MECHANICAL EQUIPMENT
P	PUMP

POWER OPERATED VALVE IDENTIFICATION

SAME AS INSTRUMENT IDENTIFICATION.

ELECTRICAL PANEL/ CONTROL STATION IDENTIFICATION

TAG NUMBER: (LCP-P) ◆

LCP PANEL DESIGNATION

P PANEL NUMBER

◆ COMPONENT DESIGNATOR

COMPONENT DESIGNATORS

◎ CRITICAL ALARM

◆ PROVIDE IN ACCORDANCE WITH DIVISION 26

◆◆ EXISTING COMPONENT TO BE RELOCATED IN ACCORDANCE WITH DIVISION 26

◆◆◆ OWNER FURNISHED COMPONENT TO BE INSTALLED IN ACCORDANCE WITH DIVISION 26

* OWNER FURNISHED COMPONENT TO BE INSTALLED IN ACCORDANCE WITH DIVISION 11 AND DIVISION 23

** PROVIDE AS PART OF A MANUFACTURER'S OR VENDOR'S PACKAGED SYSTEM IN ACCORDANCE WITH DIVISION 11, DIVISION 13 AND DIVISION 23

*** EXISTING COMPONENT TO BE RELOCATED IN ACCORDANCE WITH DIVISION 11 AND DIVISION 23

PROVIDE COMPONENT WITHOUT A DESIGNATOR IN ACCORDANCE WITH DIVISION 11, DIVISION 13 AND DIVISION 23

GENERAL NOTES:

1. THIS IS A STANDARD LEGEND. NOT ALL OF THE INFORMATION SHOWN ON THIS LEGEND IS USED IN THESE CONTRACT DRAWINGS.
2. CROSS-HATCHED PORTIONS OF P&ID'S

   INDICATE FUTURE OR CONCURRENT WORK WHICH IS NOT A PART OF THIS CONTRACT.
3. THERE IS NO INTENT TO SHOW ALL EXISTING FACILITIES ON THE P&ID'S.
4. FOB ON PLAN SHEETS INDICATES FRONT OF BUILDING

IC2

FILE NAME = L:\7355\CAD\Sheets\Building\I&C\7355-PS38-IC2.dgn

KNIGHT Engineers & Architects

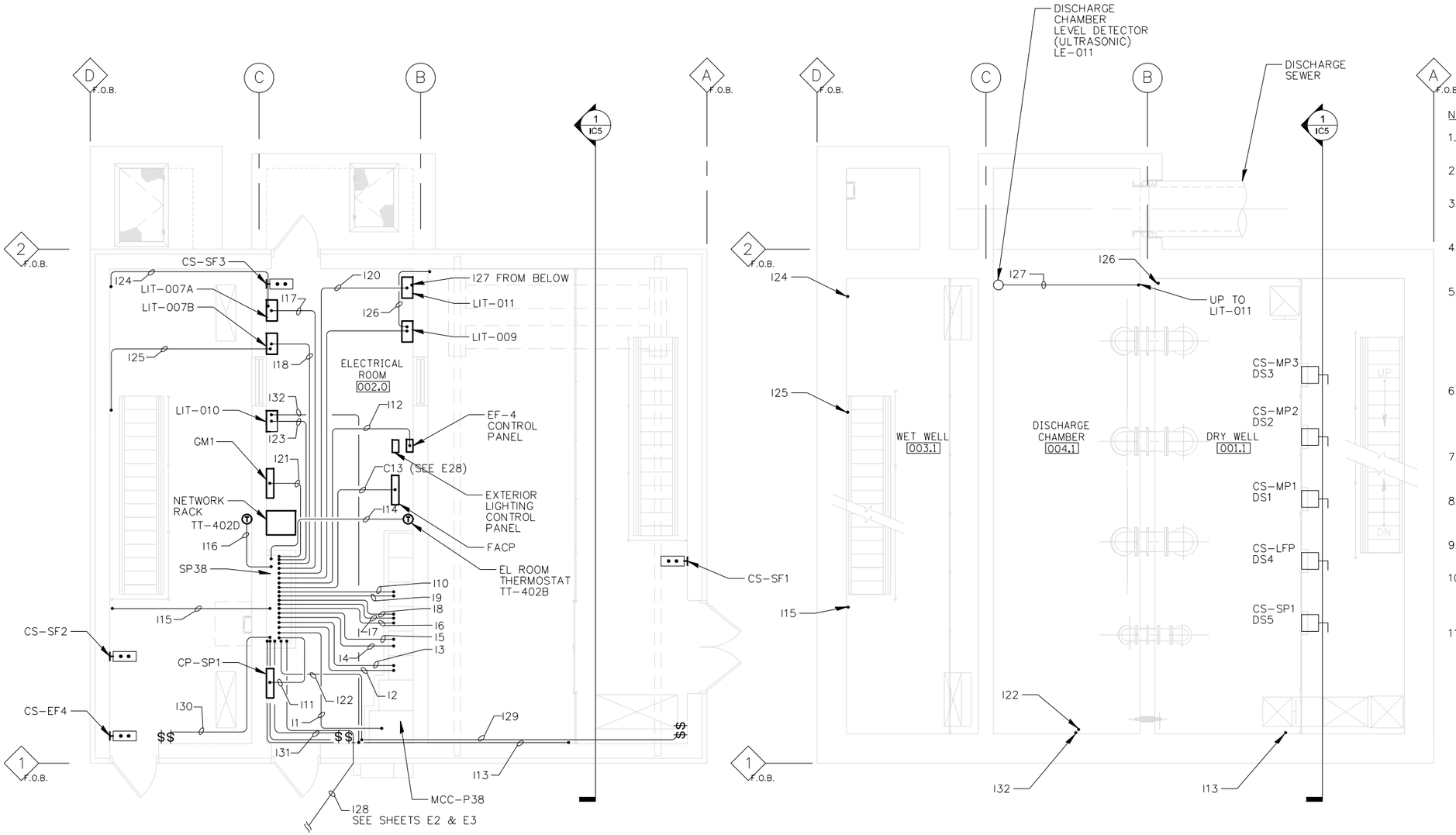
USER NAME = cliss	DESIGNED PNS	REVISED -
	DRAWN RAM	REVISED -
PLOT SCALE = 1@0.166667	CHECKED JWM	REVISED -
PLOT DATE = 6/25/2020	DATE 06/26/20	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

I & C SYMBOL LIST, ABBREVIATIONS & GENERAL NOTES
PUMP STATION 38

SCALE: | SHEET OF 2 SHEETS | STA. | TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	267
		CONTRACT NO. 62B65		
	ILLINOIS FED. AID PROJECT			



1 I & C GROUND FLOOR PLAN – EL: 671.50
SCALE: ¼" = 1'-0"

2 I & C INTERMEDIATE FLOOR PLAN (–1) – EL: 661.58 – DISCHARGE EL: 664.00 HP
SCALE: ¼" = 1'-0"

NOTES:

1. SEE SHEETS IC1 AND IC2 FOR INSTRUMENTATION SYMBOL LISTS, ABBREVIATIONS, AND GENERAL NOTES.
2. REFER TO SHEETS E5, E15 AND E16 FOR DETAILS REGARDING MCC–P38.
3. PROVIDE EXPLOSION–PROOF SEAL–OFF FITTINGS ON ALL CONDUIT EXITING CLASSIFIED OR RATED LOCATIONS. FITTINGS SHALL BE INSTALLED IN THE CLASSIFIED OR RATED LOCATION.
4. ALL EQUIPMENT INSTALLED IN DRY WELL, WET WELL, AND DISCHARGE CHAMBER SHALL BE RATED FOR CLASS 1, DIVISION 2 EXPLOSION–PROOF ENVIRONMENT.
5. INTRINSICALLY SAFE WIRING SHALL BE SEGREGATED FROM ALL OTHER TYPES OF WIRING. INTRINSICALLY SAFE WIRING SHALL BE INSTALLED IN A CONDUIT ONLY WITH OTHER INTRINSICALLY SAFE CIRCUITS IN PANELS AND EQUIPMENT. INTRINSICALLY SAFE CIRCUIT WIRING SHALL HAVE A MINIMUM OF 3 INCHES OF CLEARANCE. OR A GROUNDED METAL OR INSULATING PARTITION, BETWEEN THE INTRINSICALLY SAFE AND OTHER TYPES OF WIRING. SEE NEC ARTICLE 504.
6. SHIELDED AND UNSHIELDED CONDUCTORS SHALL BE RUN IN CONDUIT. SHIELDED CONDUCTORS SHALL NOT BE COMBINED WITH UNSHIELDED CONDUCTORS IN ANY CONDUIT. NEITHER SHIELDED NOR UNSHIELDED CONDUCTORS SHALL BE INCLUDED IN THE SAME CONDUIT AS POWER WIRING.
7. SHIELDED AND UNSHIELDED CONDUCTORS SHALL HAVE A MINIMUM OF 6" SEPARATION BETWEEN CONDUIT ON PARALLEL RUNS.
8. SHIELDED AND UNSHIELDED CONDUCTORS SHALL BE SEPARATED BY STEEL BARRIERS IN ALL COMBINED SIGNAL JUNCTION BOXES AND INSTRUMENT TERMINATION CABINETS.
9. CONDUCTORS SHALL NOT BE SPLICED EXCEPT AT TERMINALS OR AS DESIGNATED BY THE ENGINEER.
10. THE CONDUIT PLANS ARE DIAGRAMMATIC IN NATURE, AND DO NOT SHOW A COMPLETE CONDUIT SYSTEM. PROVIDE PULL BOXES AND OTHER CONDUIT SYSTEM COMPONENTS AS REQUIRED FOR INSTALLATION AND TO MEET NEC.
11. CONDUITS NEED TO BE PVC COATED RGS IN DRY WELL, WET WELL AND OUT DOORS. DESIGN GUIDE ALLOW RGS ONLY IN ELECTRICAL ROOM

0 4' 8' 12' 16'
SCALE IN FEET

IC3

FILE NAME = L:\7355\CAD\Sheets\Building1&C\7355-PS38-IC3.dgn

KNIGHT Engineers & Architects

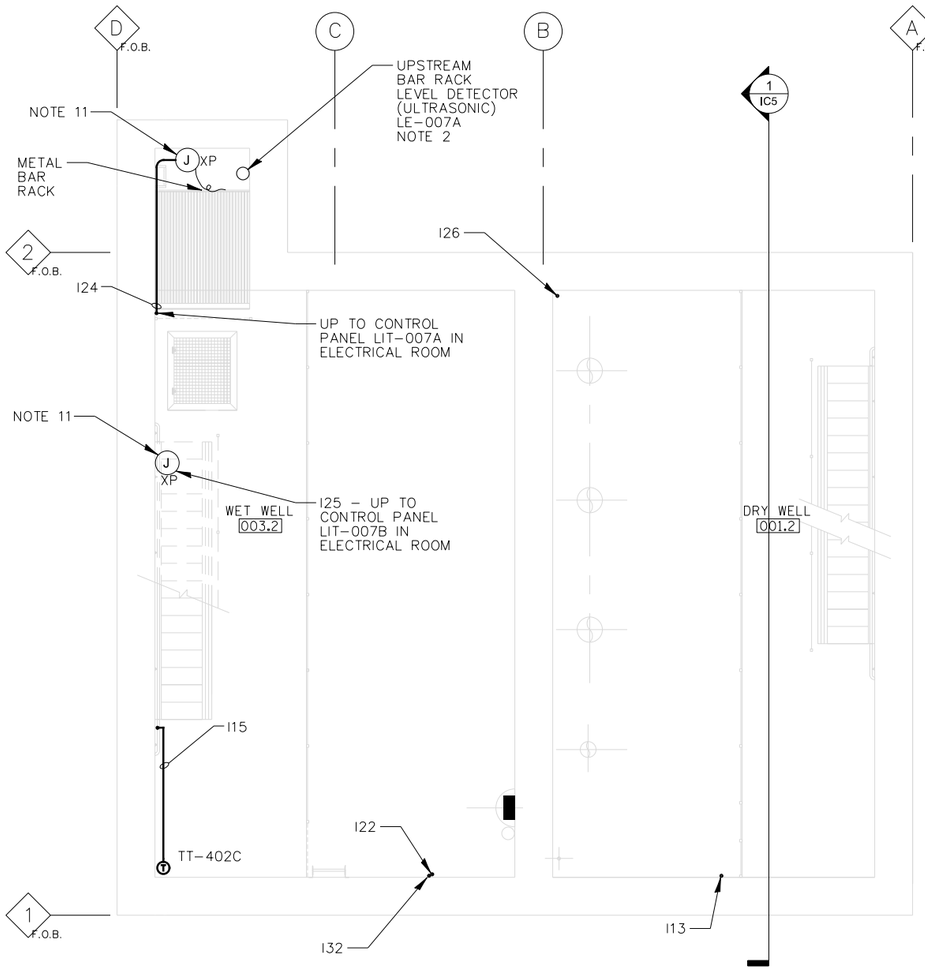
USER NAME = cliss	DESIGNED	REVISED -
	DRAWN RAM	REVISED -
PLOT SCALE = 1:7.99973	CHECKED JWM	REVISED -
PLOT DATE = 6/25/2020	DATE 06/26/20	REVISED -

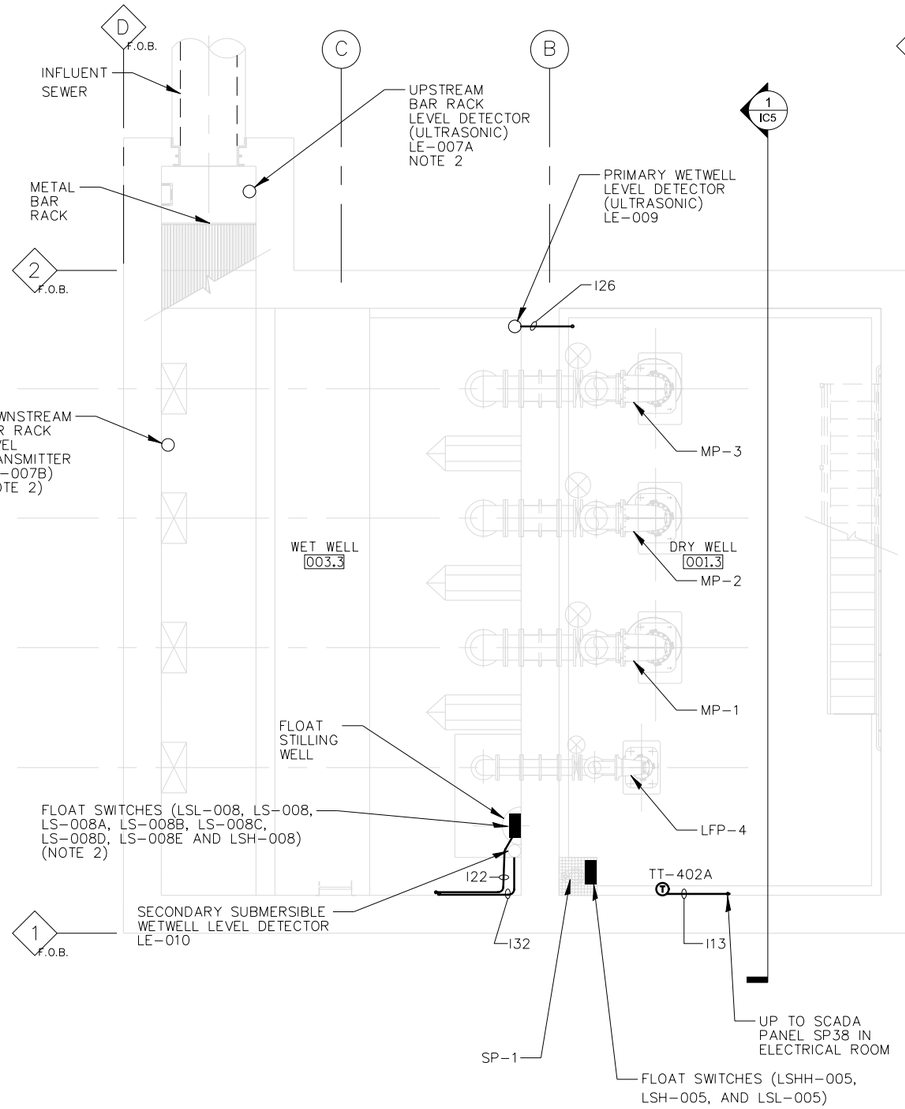
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

I & C GROUND & INTERMEDIATE FLOOR PLANS
PUMP STATION 38

SCALE: | SHEET OF 3 SHEETS | STA. | TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	268
		CONTRACT NO. 62B65		
	ILLINOIS FED. AID PROJECT			





NOTES:

1. SEE SHEETS IC1 AND IC2 FOR INSTRUMENTATION SYMBOL LISTS, ABBREVIATIONS, AND GENERAL NOTES.
2. REFER TO MECHANICAL DRAWING SET FOR ADDITIONAL DETAILS.
3. PROVIDE EXPLOSION-PROOF SEAL-OFF FITTINGS ON ALL CONDUIT EXITING CLASSIFIED OR RATED LOCATIONS. FITTINGS SHALL BE INSTALLED IN THE CLASSIFIED OR RATED LOCATION.
4. ALL EQUIPMENT INSTALLED IN DRY WELL, WET WELL, AND DISCHARGE CHAMBER SHALL BE RATED FOR CLASS 1, DIVISION 2 EXPLOSION-PROOF ENVIRONMENT.
5. INTRINSICALLY SAFE WIRING SHALL BE SEGREGATED FROM ALL OTHER TYPES OF WIRING. INTRINSICALLY SAFE WIRING SHALL BE INSTALLED IN A CONDUIT ONLY WITH OTHER INTRINSICALLY SAFE CIRCUITS IN PANELS AND EQUIPMENT. INTRINSICALLY SAFE CIRCUIT WIRING SHALL HAVE A MINIMUM OF 3 INCHES OF CLEARANCE. OR A GROUNDED METAL OR INSULATING PARTITION, BETWEEN THE INTRINSICALLY SAFE AND OTHER TYPES OF WIRING. SEE NEC ARTICLE 504.
6. SHIELDED AND UNSHIELDED CONDUCTORS SHALL BE RUN IN CONDUIT. SHIELDED CONDUCTORS SHALL NOT BE COMBINED WITH UNSHIELDED CONDUCTORS IN ANY CONDUIT. NEITHER SHIELDED NOR UNSHIELDED CONDUCTORS SHALL BE INCLUDED IN THE SAME CONDUIT AS POWER WIRING.
7. SHIELDED AND UNSHIELDED CONDUCTORS SHALL HAVE A MINIMUM OF 6" SEPARATION BETWEEN CONDUIT ON PARALLEL RUNS.
8. SHIELDED AND UNSHIELDED CONDUCTORS SHALL BE SEPARATED BY STEEL BARRIERS IN ALL COMBINED SIGNAL JUNCTION BOXES AND INSTRUMENT TERMINATION CABINETS.
9. CONDUCTORS SHALL NOT BE SPLICED EXCEPT AT TERMINALS OR AS DESIGNATED BY THE ENGINEER.
10. THE CONDUIT PLANS ARE DIAGRAMMATIC IN NATURE, AND DO NOT SHOW A COMPLETE CONDUIT SYSTEM. PROVIDE PULL BOXES AND OTHER CONDUIT SYSTEM COMPONENTS AS REQUIRED FOR INSTALLATION AND TO MEET NEC.
11. JUNCTION BOX TO BE MOUNTED ABOVE TRANSDUCER PIPE HOUSING.

1 I & C INTERMEDIATE FLOOR PLAN (-2) - EL: 651.66
SCALE: ¼" = 1'-0"

2 I & C WET WELL FLOOR PLAN (-3) - DRY EL: 641.00 - WET EL: 639.50
SCALE: ¼" = 1'-0"

N

0 4' 8' 12' 16'
SCALE IN FEET

IC4

FILE NAME = L:\7355\CAD\Sheets\Building\I&C\7355-PS38-IC4.dgn

KNIGHT Engineers & Architects

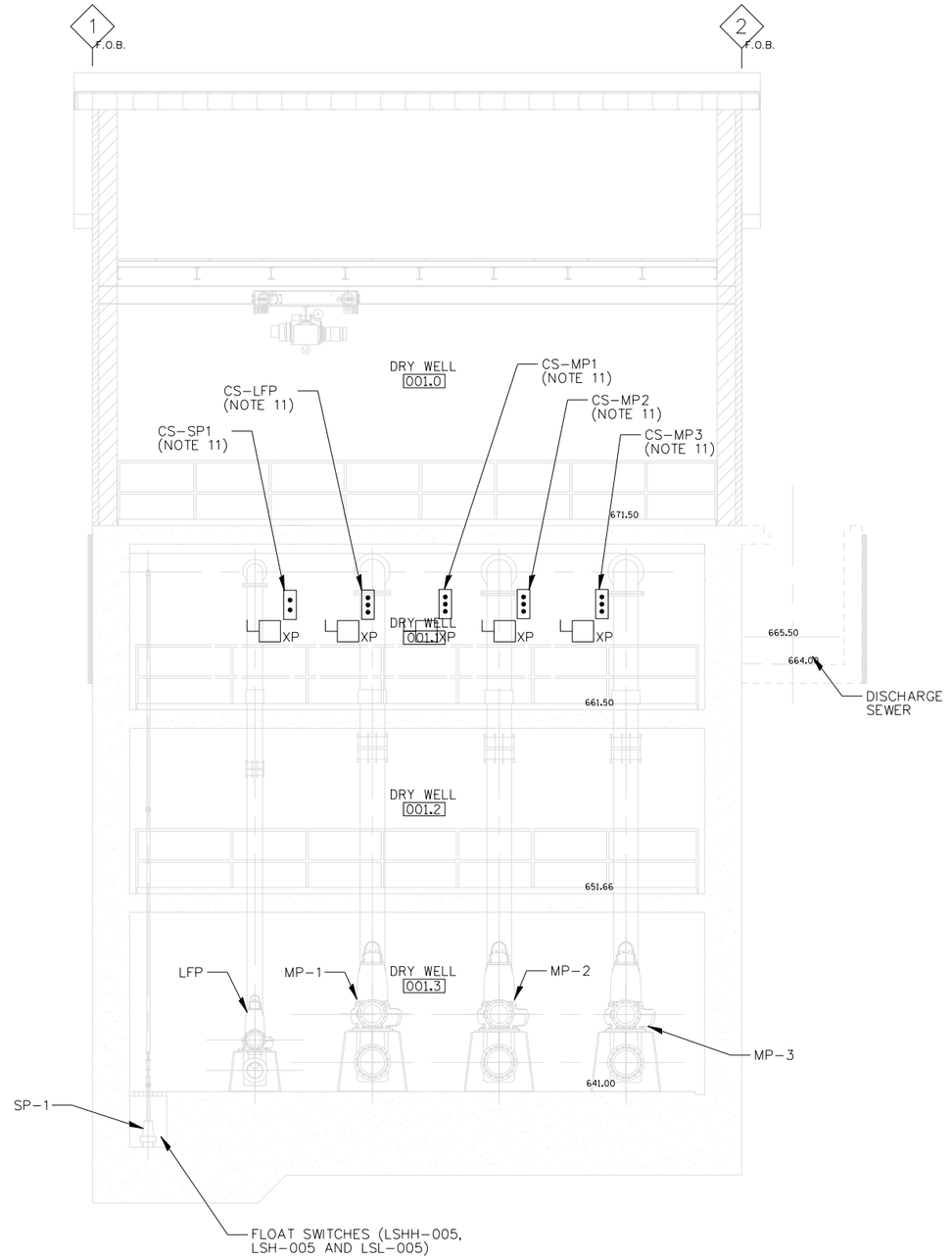
USER NAME = cliss	DESIGNED PNS	REVISED -
	DRAWN RAM	REVISED -
PLOT SCALE = 1:7.99973	CHECKED JWM	REVISED -
PLOT DATE = 6/25/2020	DATE 06/26/20	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

I & C INTERMEDIATE & WET WELL FLOOR PLANS
PUMP STATION 38

SCALE: | SHEET OF 4 SHEETS | STA. | TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	269
		CONTRACT NO. 62B65		
	ILLINOIS FED. AID PROJECT			



1 DRY WELL SECTION
SCALE: ¼" = 1'-0"

NOTES:

1. SEE SHEETS IC1 AND IC2 FOR INSTRUMENTATION SYMBOL LISTS, ABBREVIATIONS, AND GENERAL NOTES.
2. REFER TO MECHANICAL DRAWING SET FOR ADDITIONAL DETAILS.
3. PROVIDE EXPLOSION-PROOF SEAL-OFF FITTINGS ON ALL CONDUIT EXITING CLASSIFIED OR RATED LOCATIONS. FITTINGS SHALL BE INSTALLED IN THE CLASSIFIED OR RATED LOCATION.
4. ALL EQUIPMENT INSTALLED IN DRY WELL, WET WELL, AND DISCHARGE CHAMBER SHALL BE RATED FOR CLASS 1, DIVISION 2 EXPLOSION-PROOF ENVIRONMENT.
5. INTRINSICALLY SAFE WIRING SHALL BE SEGREGATED FROM ALL OTHER TYPES OF WIRING. INTRINSICALLY SAFE WIRING SHALL BE INSTALLED IN A CONDUIT ONLY WITH OTHER INTRINSICALLY SAFE CIRCUITS IN PANELS AND EQUIPMENT. INTRINSICALLY SAFE CIRCUIT WIRING SHALL HAVE A MINIMUM OF 3 INCHES OF CLEARANCE, OR A GROUNDED METAL OR INSULATING PARTITION, BETWEEN THE INTRINSICALLY SAFE AND OTHER TYPES OF WIRING. SEE NEC ARTICLE 504.
6. SHIELDED AND UNSHIELDED CONDUCTORS SHALL BE RUN IN CONDUIT. SHIELDED CONDUCTORS SHALL NOT BE COMBINED WITH UNSHIELDED CONDUCTORS IN ANY CONDUIT. NEITHER SHIELDED NOR UNSHIELDED CONDUCTORS SHALL BE INCLUDED IN THE SAME CONDUIT AS POWER WIRING.
7. SHIELDED AND UNSHIELDED CONDUCTORS SHALL HAVE A MINIMUM OF 6" SEPARATION BETWEEN CONDUIT ON PARALLEL RUNS.
8. SHIELDED AND UNSHIELDED CONDUCTORS SHALL BE SEPARATED BY STEEL BARRIERS IN ALL COMBINED SIGNAL JUNCTION BOXES AND INSTRUMENT TERMINATION CABINETS.
9. CONDUCTORS SHALL NOT BE SPLICED EXCEPT AT TERMINALS OR AS DESIGNATED BY THE ENGINEER.
10. THE CONDUIT PLANS ARE DIAGRAMMATIC IN NATURE, AND DO NOT SHOW A COMPLETE CONDUIT SYSTEM. PROVIDE PULL BOXES AND OTHER CONDUIT SYSTEM COMPONENTS AS REQUIRED FOR INSTALLATION AND TO MEET NEC.
11. REFER TO SHEET E8 FOR ADDITIONAL DETAILS.

0 4' 8' 12' 16'

SCALE IN FEET

IC5

FILE NAME = L:\7355\CAD\Sheets\Building\I&C\7355-PS38-IC5.dgn

KNIGHT
Engineers & Architects

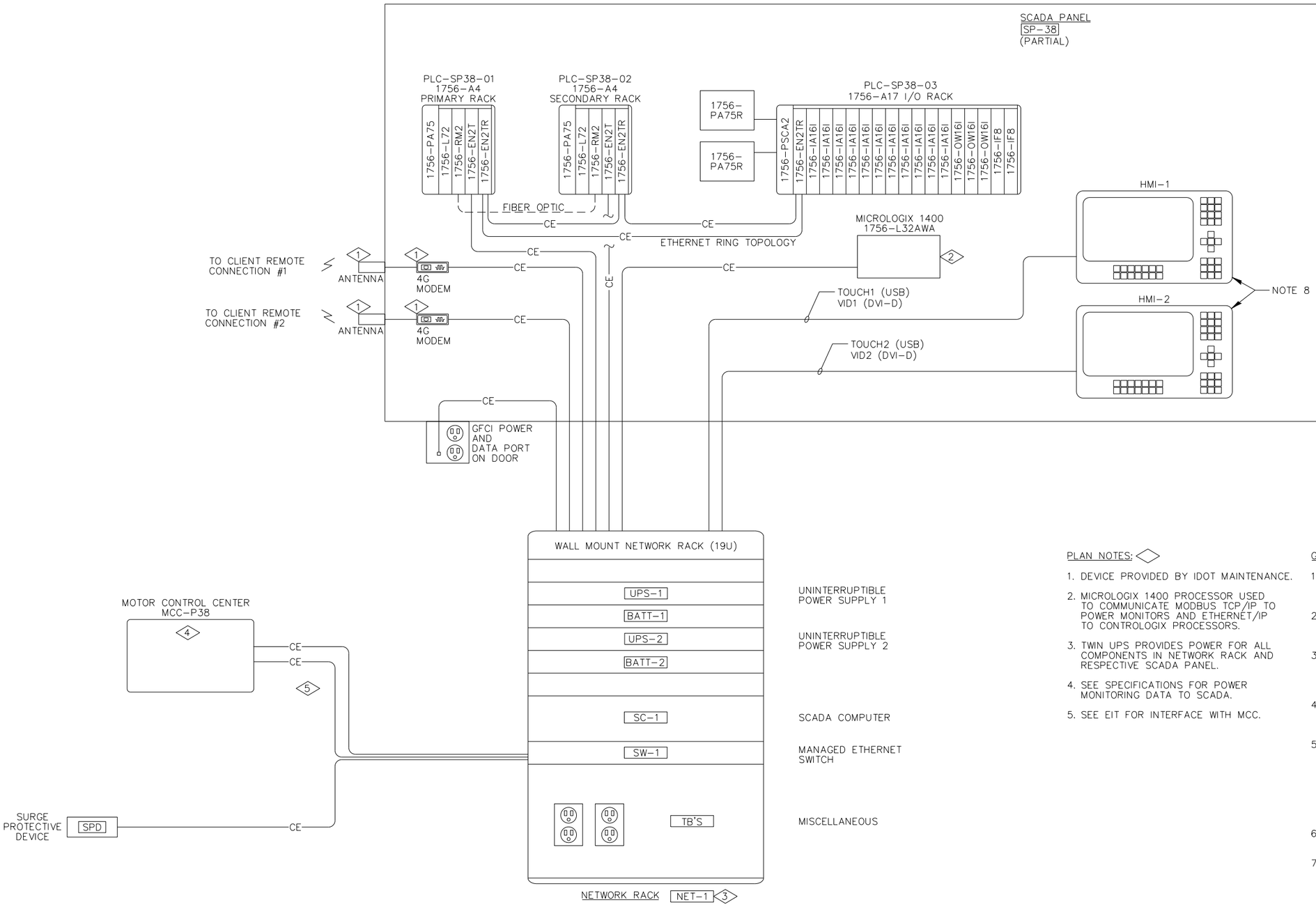
USER NAME = cliss	DESIGNED PNS	REVISED -
	DRAWN RAM	REVISED -
PLOT SCALE = 1:7.99973	CHECKED JWM	REVISED -
PLOT DATE = 6/25/2020	DATE 06/26/20	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

I & C PUMP STATION INSTRUMENTATION SECTION
PUMP STATION 38

SCALE: | SHEET OF 5 SHEETS | STA. | TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	270
		CONTRACT NO. 62B65		
	ILLINOIS FED. AID PROJECT			



PLAN NOTES: ◇

1. DEVICE PROVIDED BY IDOT MAINTENANCE.
2. MICROLOGIX 1400 PROCESSOR USED TO COMMUNICATE MODBUS TCP/IP TO POWER MONITORS AND ETHERNET/IP TO CONTROLOGIX PROCESSORS.
3. TWIN UPS PROVIDES POWER FOR ALL COMPONENTS IN NETWORK RACK AND RESPECTIVE SCADA PANEL.
4. SEE SPECIFICATIONS FOR POWER MONITORING DATA TO SCADA.
5. SEE EIT FOR INTERFACE WITH MCC.

GENERAL NOTES:

1. SEE SHEETS IC1 AND IC2 FOR INSTRUMENTATION SYMBOL LISTS, ABBREVIATIONS, AND GENERAL NOTES.
2. CONTRACTOR TO SIZE CONTROLLER FOR APPLICATION. PROVIDE 25% SPARE MEMORY FOR FUTURE GROWTH.
3. CONTRACTOR IS RESPONSIBLE FOR PROVIDING ADDITIONAL PLC MODULES AS REQUIRED TO ENSURE OPERATION AS DETAILED IN THE CONTRACT DOCUMENTS.
4. REFER TO SPECIFICATION SECTION 40 94 24 – HMI IMPROVEMENTS FOR DETAILS REGARDING WORK AT THIS LOCATION.
5. THE INTENT OF THIS DRAWING IS TO SHOW GENERAL SYSTEM ARCHITECTURE. IT IS NOT THE INTENT OF THIS DRAWING TO SHOW EVERY PLC MODULE AND/OR PART NUMBER FOR THE PROJECT. I/O MODULES AND MODULE POSITION DETERMINED BY ACTUAL NUMBER OF I/O (INCLUDING SPARES). SEE SPECIFICATIONS FOR DETAILS.
6. ALL CE (COPPER ETHERNET) SHALL BE CAT-5e, SEE SPECIFICATIONS FOR DETAILS.
7. I/O MODULES, RACKS, AND HARDWARE SHALL BE INCLUDED AND SUFFICIENT FOR TWO ADDITIONAL FUTURE PUMPS AND ASSOCIATED FUNCTIONALITY.
8. HMI-1 AND HMI-2 ARE MOUNTED ON SCADA PANEL DOOR.

IC6

FILE NAME = L:\7395\CAD\Sheets\Building1&C\7395-PS38-IC6.dgn

KNIGHT
Engineers & Architects

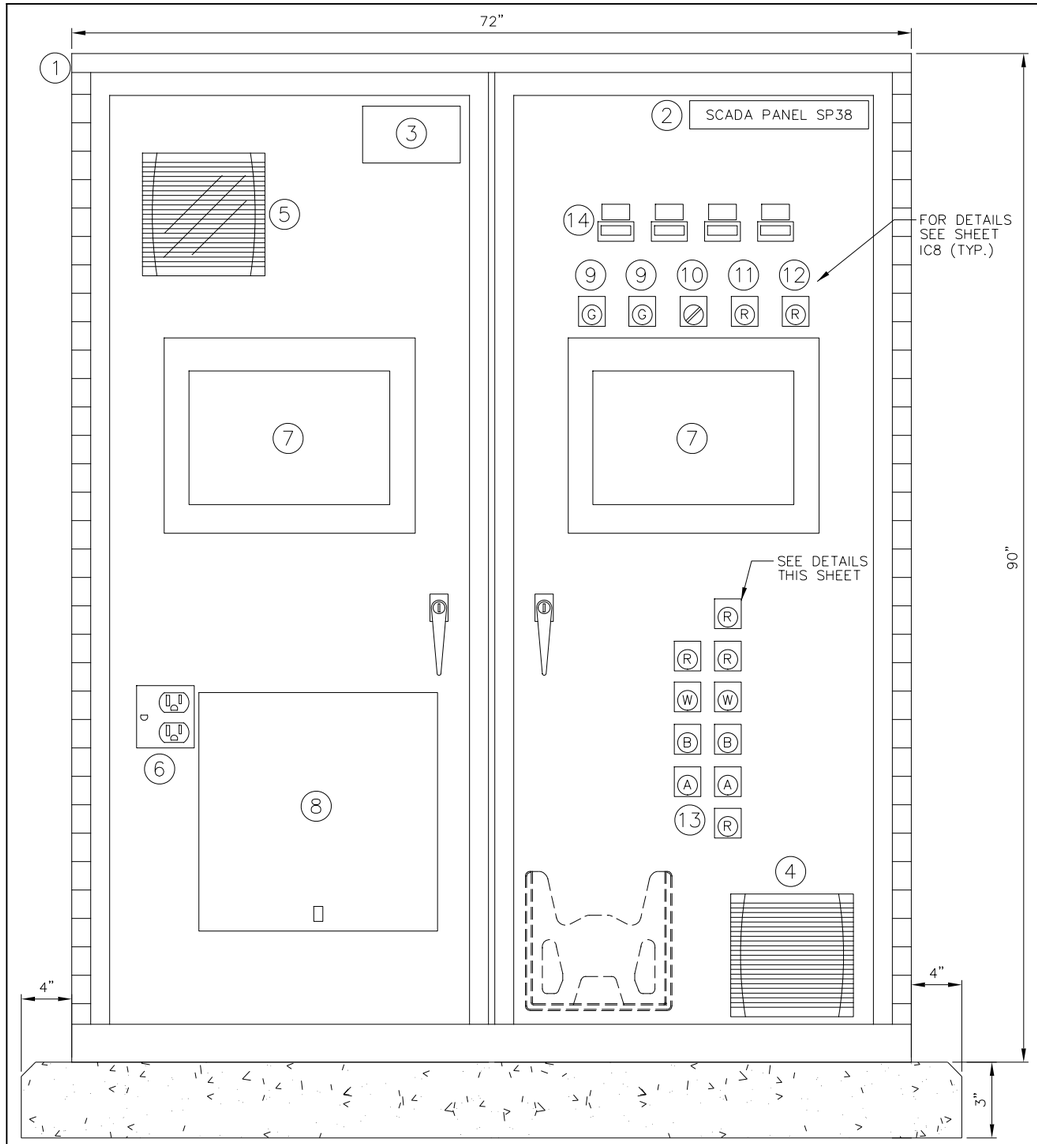
USER NAME = cliss	DESIGNED PNS	REVISED -
	DRAWN RAM	REVISED -
PLOT SCALE = 1:0.166661	CHECKED JWM	REVISED -
PLOT DATE = 6/25/2020	DATE 06/26/20	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

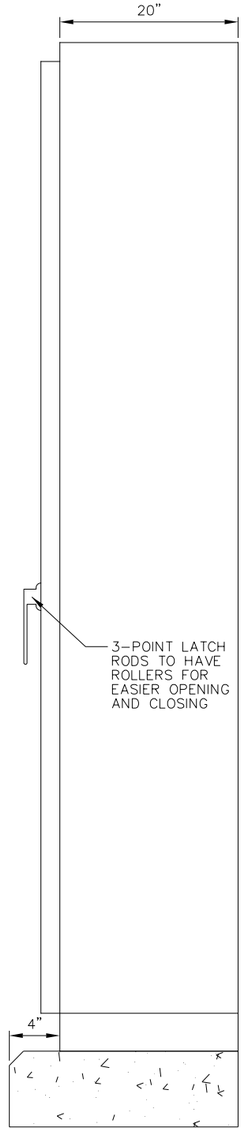
I & C SCADA SYSTEM ARCHITECTURE
PUMP STATION 38

SCALE: | SHEET OF 6 SHEETS | STA. | TO STA.

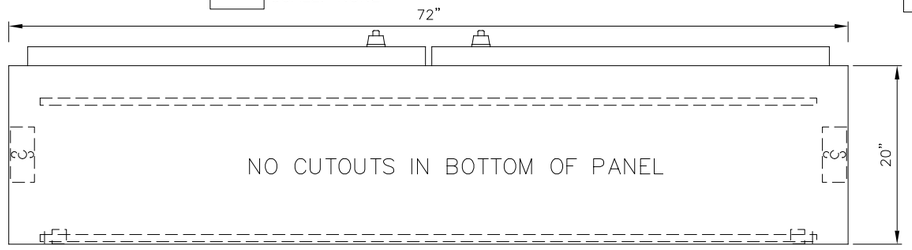
F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	271
		CONTRACT NO. 62B65		
	ILLINOIS	FED. AID PROJECT		



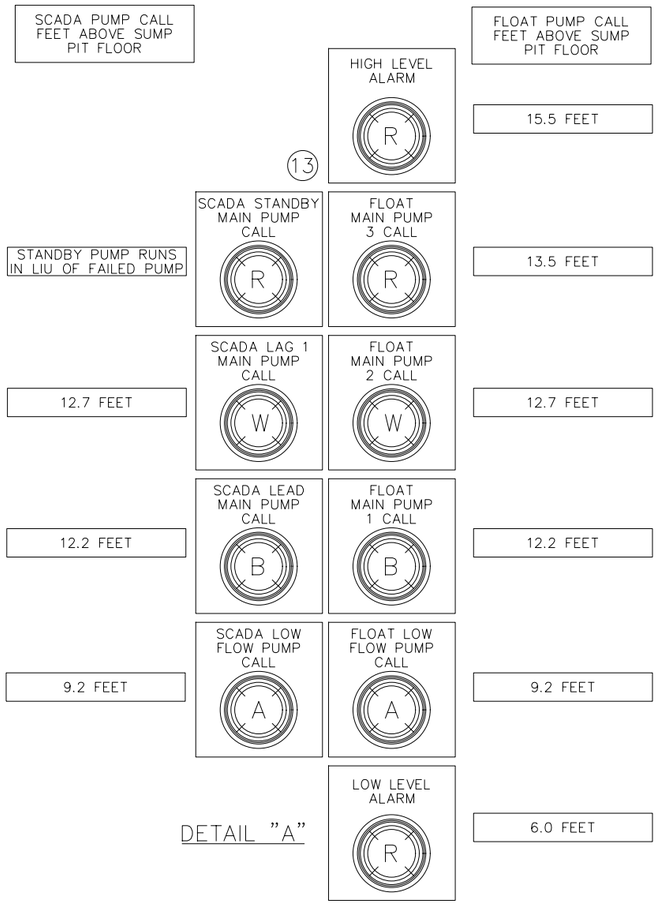
1 SCADA PANEL SP38 FRONT VIEW
SCALE: NONE



2 SCADA PANEL SP38 SIDE VIEW
SCALE: NONE



3 SCADA PANEL SP38 PLAN VIEW
SCALE: NONE



DETAIL "A"

NOTES:

1. SEE SHEETS IC1 AND IC2 FOR INSTRUMENTATION SYMBOL LIST, ABBREVIATIONS, AND GENERAL NOTES.
2. THE SCADA PANEL SHALL BE OF SUFFICIENT DEPTH TO ACCOMMODATE ALL DEVICES. PROPER CLEARANCE SHALL BE PROVIDED BETWEEN DOOR MOUNTED DEVICES AND PANEL MOUNTED DEVICES.
3. SCADA PANEL DETAIL PROVIDES INFORMATION REGARDING SOME OF THE MAJOR COMPONENTS TO BE MOUNTED IN THE PANEL. ANCILLARY DEVICES SUCH AS RELAYS, TIMER, POWER SUPPLIES, ETC., ARE NOT SHOWN. ALL DEVICES TO PROVIDE A FUNCTIONING SYSTEM AS DETAILED IN THE PLANS AND SPECIFICATIONS SHALL BE PROVIDED. CONTRACTOR TO PROVIDE SUBMITTAL DETAILING PANEL LAYOUT FOR ALL COMPONENTS.
4. REFER TO SPECIFICATION SECTION 40 94 23 FOR ADDITIONAL CONTROL PANEL AND INTRINSICALLY SAFE DEVICE INSTALLATION REQUIREMENTS.
5. NAMEPLATES TO BE WHITE WITH BLACK LETTERING.
6. INTRINSICALLY SAFE WIRING SHALL BE SEGREGATED FROM ALL OTHER TYPES OF WIRING. INTRINSICALLY SAFE WIRING SHALL BE INSTALLED IN A CONDUIT ONLY WITH OTHER INTRINSICALLY SAFE CIRCUITS IN PANELS AND EQUIPMENT. INTRINSICALLY SAFE CIRCUIT WIRING SHALL HAVE A MINIMUM OF 3 INCHES OF CLEARANCE, OR A GROUNDED METAL OR INSULATING PARTITION, BETWEEN THE INTRINSICALLY SAFE AND OTHER TYPES OF WIRING. SEE NEC ARTICLE 504.
7. REFER TO SHEET IC9 DETAIL NO. 2 FOR GROUNDING REQUIREMENTS.
8. PATCH PANEL MUST BE SUITABLE FOR SC, ST, OR LC FIBER CONNECTION. CONNECTOR, FIBER CABLE, AND FIBER PATCH CABLE TO BE PROVIDED BY OTHERS IN THE FUTURE.
9. IF A CENTER CABINET SUPPORT IS INSTALLED, THE SUPPORT SHALL BE BOLTED IN. WELDING IS NOT ALLOWED.

ITEM #		DESCRIPTION	DETAIL
1		NEMA 12 ENCLOSURE, 2-DOOR, 90x72	N/A
2		PANEL NAMEPLATE " SCADA PANEL SP38	N/A
3		ELECTRICAL NAMEPLATE	N/A
4		FAN AND FILTER ASSEMBLY	N/A
5		LOUVER KIT ASSEMBLY	N/A
6		GFCI 120VAC OUTLET AND ETHERNET PORT	N/A
7		SCADA HMI-1 AND HMI-2	N/A
8		24x24 FOLDING SHELF	N/A
9		PILOT LIGHT, LED, GREEN	IC8 "A"
10		SELECTOR SWITCH, 3-POSITION	IC8 "B"
11		PILOT LIGHT, LED, RED	IC8 "C"
12		PILOT LIGHT, LED, RED	IC8 "C"
13		PILOT LIGHT, LED, AMBER	A
		PILOT LIGHT, LED, BLUE	
		PILOT LIGHT, LED, WHITE	
		PILOT LIGHT, LED, RED	
14		PROCESS DISPLAY	IC8 "D"

IC7

FILE NAME = L:\7355\CAD\Sheets\Building\I&C7355-PS38-IC7.dgn

KNIGHT Engineers & Architects

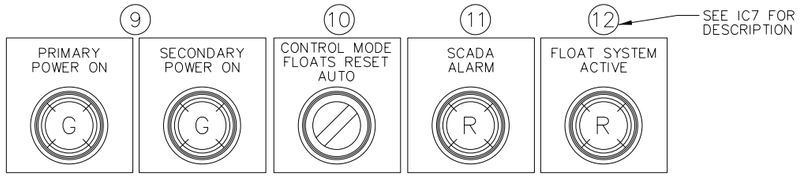
USER NAME = cliss	DESIGNED PNS	REVISED -
	DRAWN RAM	REVISED -
PLOT SCALE = 1:0.166664	CHECKED JWM	REVISED -
PLOT DATE = 6/25/2020	DATE 06/26/20	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

I & C SCADA PANEL SP38 DETAIL
PUMP STATION 38

SCALE: | SHEET OF 7 SHEETS | STA. | TO STA.

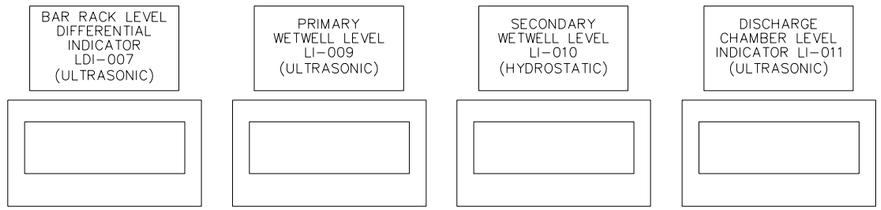
F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	272
		CONTRACT NO. 62B65		
	ILLINOIS FED. AID PROJECT			



DETAIL "A" DETAIL "B" DETAIL "C"

ITEM	QTY	DESCRIPTION
1	1	78x64 PANEL
2	2	LED LIGHT & DOOR SWITCH
3	2	PLC POWER SUPPLY
4	1	PRIMARY CONTROLLOGIX PROCESSOR AND RACK
5	1	SECONDARY CONTROLLOGIX PROCESSOR AND RACK
6	1	4G MODEM
7	1	4G MODEM
8	AS REQ'D	PLC REMOTE RACK AND MODULES
9	1	MICROLOGIX PLC PROCESSOR
10	2	24VDC POWER SUPPLY (PS1, PS2)
11	2	120VAC LINE FILTER (LF1, LF2)
12	AS REQ'D	CIRCUIT BREAKERS AND FUSES
13		NOT USED
14	AS REQ'D	TIME DELAY RELAYS
15	AS REQ'D	RELAYS
16	AS REQ'D	TERMINAL BLOCK
17	AS REQ'D	INTRINSICALLY SAFE RELAYS
18	1	GFCI, 120VAC, 10A

NAMEPLATE SCHEDULE			
(17)	(15)	(14)	(12)
ISB1	DCR1	TDFM	CB1
ISB2	DCR2	SPARE1	CB2
ISB3	AC-R	SPARE2	CB3
ISB4	FMR	SPARE3	CB4
ISB5	PLC-FR		CB5
ISB6	MP1		CB6
ISB7	MP2		CB7
ISB8	MP3		CB8
ISBPF	LFP1		CB9
SPARE1	FR8		CB10
SPARE2	FR7		CB11
SPARE3	FR6		CB12
	FR5		CB13
	FR4		CB14
	FR3		CB15
	FR2		CB16
	FR1		CB17
	FRPF		CB18
	SPARE1		CB19
	SPARE2		SPARE1
	SPARE3		SPARE2
			SPARE3
			SPARE4

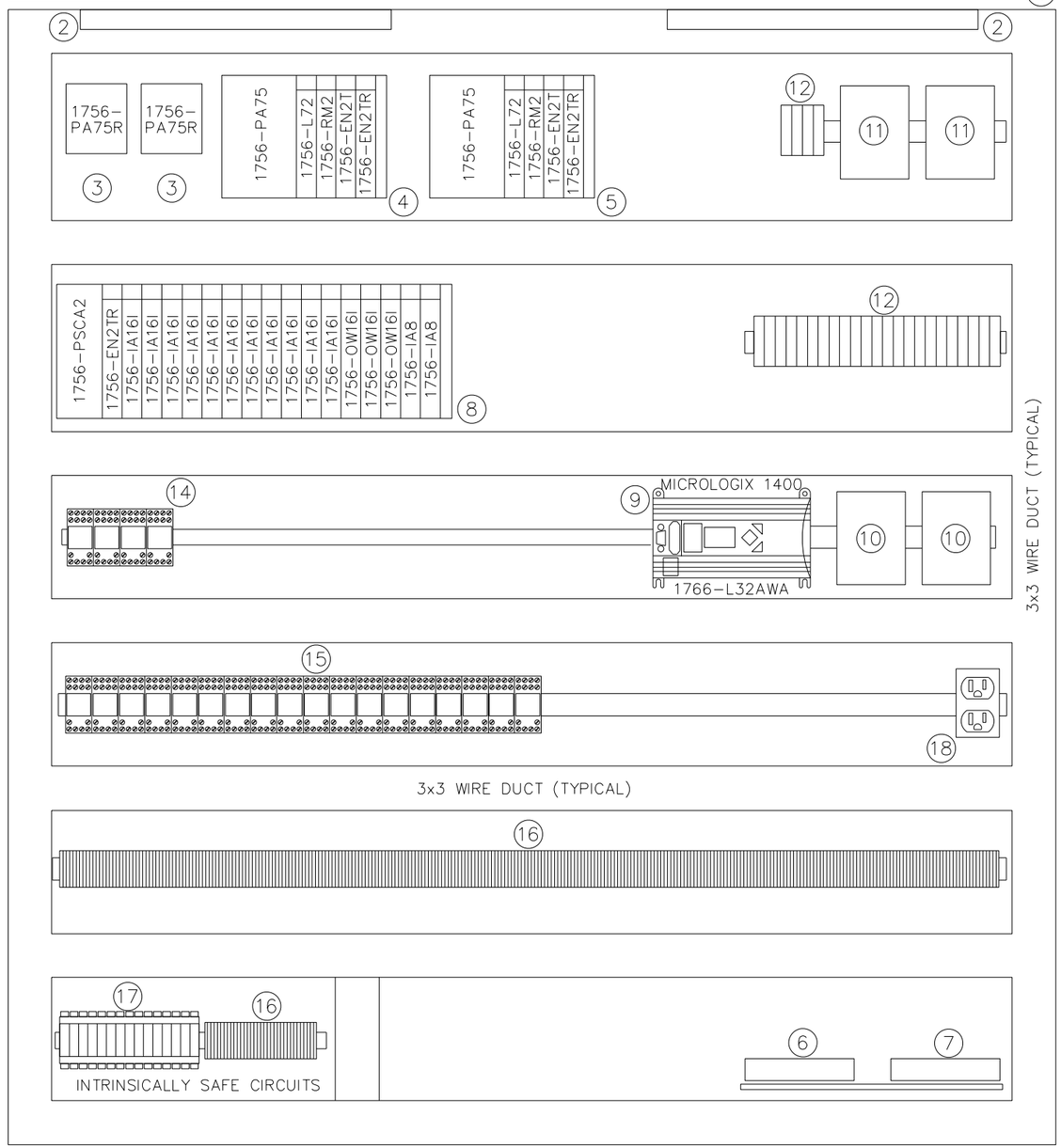


DETAIL "D"

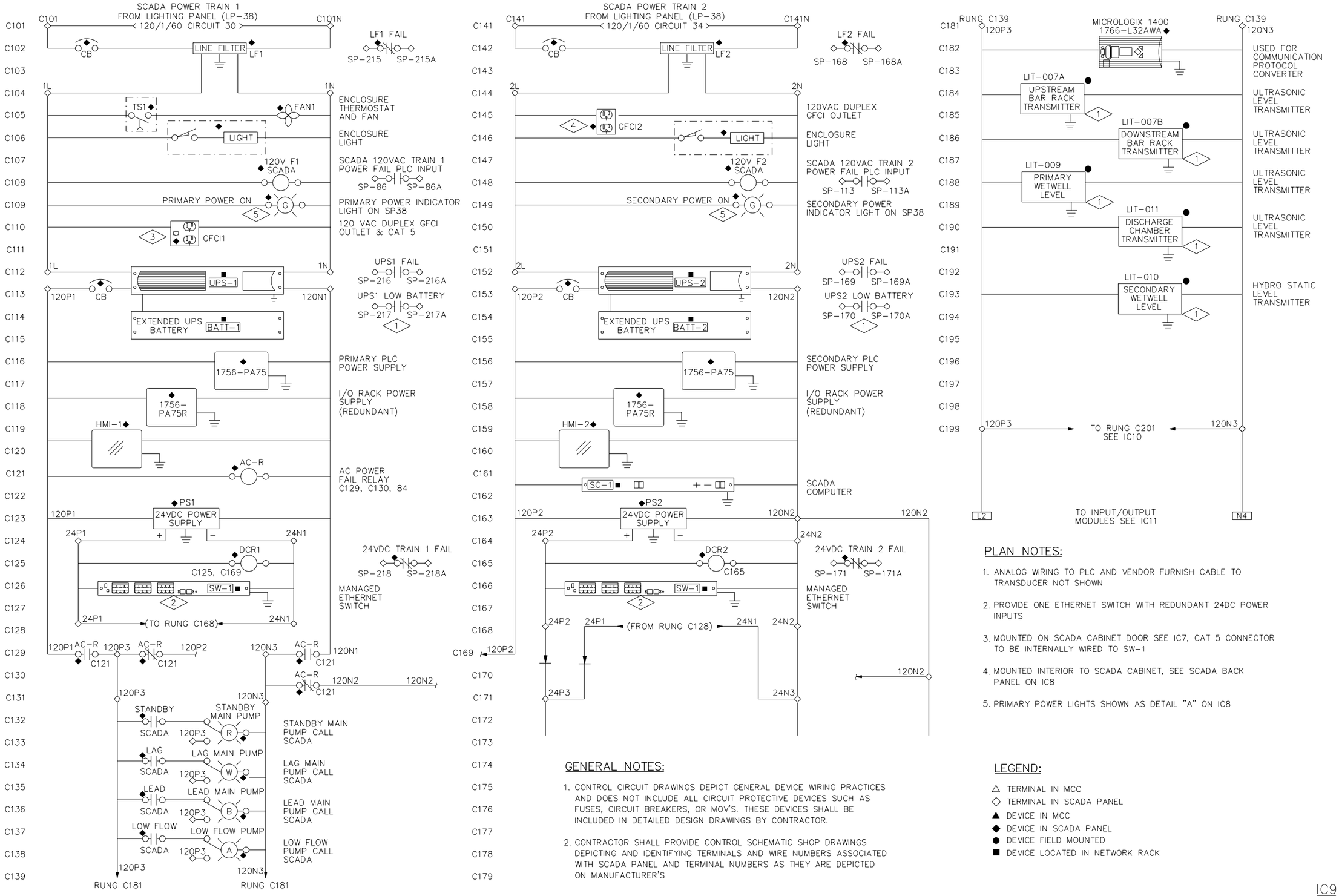
NOTES:

1. SEE SHEETS IC1 AND IC2 FOR INSTRUMENTATION SYMBOL LIST, ABBREVIATIONS, AND GENERAL NOTES.
2. THE SCADA PANEL SHALL BE OF SUFFICIENT DEPTH TO ACCOMMODATE ALL DEVICES. PROPER CLEARANCE SHALL BE PROVIDED BETWEEN DOOR MOUNTED DEVICES AND PANEL MOUNTED DEVICES.
3. SCADA PANEL DETAIL PROVIDES INFORMATION REGARDING SOME OF THE MAJOR COMPONENTS TO BE MOUNTED IN THE PANEL. ANCILLARY DEVICES SUCH AS RELAYS, TIMER, POWER SUPPLIES, ETC., ARE NOT SHOWN. ALL DEVICES TO PROVIDE A FUNCTIONING SYSTEM AS DETAILED IN THE PLANS AND SPECIFICATIONS SHALL BE PROVIDED. CONTRACTOR TO PROVIDE SUBMITTAL DETAILING PANEL LAYOUT FOR ALL COMPONENTS.
4. REFER TO SPECIFICATION SECTION 40 94 23 FOR ADDITIONAL CONTROL PANEL AND INTRINSICALLY SAFE DEVICE INSTALLATION REQUIREMENTS.
5. NAMEPLATES TO BE WHITE WITH BLACK LETTERING.
6. INTRINSICALLY SAFE WIRING SHALL BE SEGREGATED FROM ALL OTHER TYPES OF WIRING. INTRINSICALLY SAFE WIRING SHALL BE INSTALLED IN A CONDUIT ONLY WITH OTHER INTRINSICALLY SAFE CIRCUITS IN PANELS AND EQUIPMENT. INTRINSICALLY SAFE CIRCUIT WIRING SHALL HAVE A MINIMUM OF 3 INCHES OF CLEARANCE, OR A GROUNDED METAL OR INSULATING PARTITION, BETWEEN THE INTRINSICALLY SAFE AND OTHER TYPES OF WIRING. SEE NEC ARTICLE 504.
7. REFER TO SHEET IC24 DETAIL NO. 1 FOR GROUNDING REQUIREMENTS.

SCADA BACK PANEL



IC8



PLAN NOTES:

1. ANALOG WIRING TO PLC AND VENDOR FURNISH CABLE TO TRANSDUCER NOT SHOWN
2. PROVIDE ONE ETHERNET SWITCH WITH REDUNDANT 24DC POWER INPUTS
3. MOUNTED ON SCADA CABINET DOOR SEE IC7, CAT 5 CONNECTOR TO BE INTERNALLY WIRED TO SW-1
4. MOUNTED INTERIOR TO SCADA CABINET, SEE SCADA BACK PANEL ON IC8
5. PRIMARY POWER LIGHTS SHOWN AS DETAIL "A" ON IC8

GENERAL NOTES:

1. CONTROL CIRCUIT DRAWINGS DEPICT GENERAL DEVICE WIRING PRACTICES AND DOES NOT INCLUDE ALL CIRCUIT PROTECTIVE DEVICES SUCH AS FUSES, CIRCUIT BREAKERS, OR MOV'S. THESE DEVICES SHALL BE INCLUDED IN DETAILED DESIGN DRAWINGS BY CONTRACTOR.
2. CONTRACTOR SHALL PROVIDE CONTROL SCHEMATIC SHOP DRAWINGS DEPICTING AND IDENTIFYING TERMINALS AND WIRE NUMBERS ASSOCIATED WITH SCADA PANEL AND TERMINAL NUMBERS AS THEY ARE DEPICTED ON MANUFACTURER'S

LEGEND:

- △ TERMINAL IN MCC
- ◇ TERMINAL IN SCADA PANEL
- ▲ DEVICE IN MCC
- ◆ DEVICE IN SCADA PANEL
- ● DEVICE FIELD MOUNTED
- ■ DEVICE LOCATED IN NETWORK RACK

IC9

FILE NAME = Lit\7355\CAD\Sheets\Building1&C\7355-PS38-IC9.dgn

KNIGHT Engineers & Architects

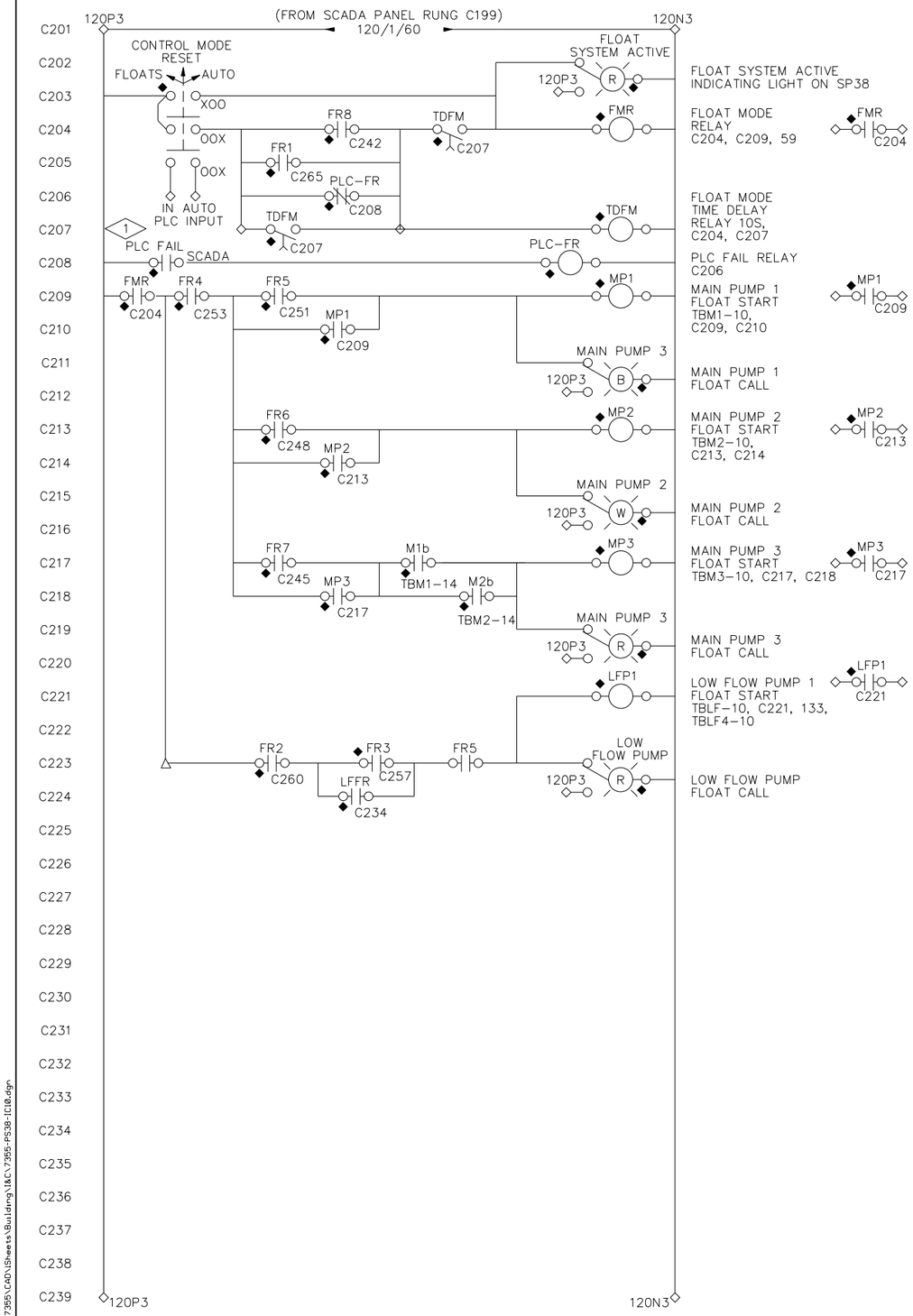
USER NAME = cliss	DESIGNED PNS	REVISED -
	DRAWN RAM	REVISED -
PLOT SCALE = 1:0.166661	CHECKED JWM	REVISED -
PLOT DATE = 6/25/2020	DATE 06/26/20	REVISED -

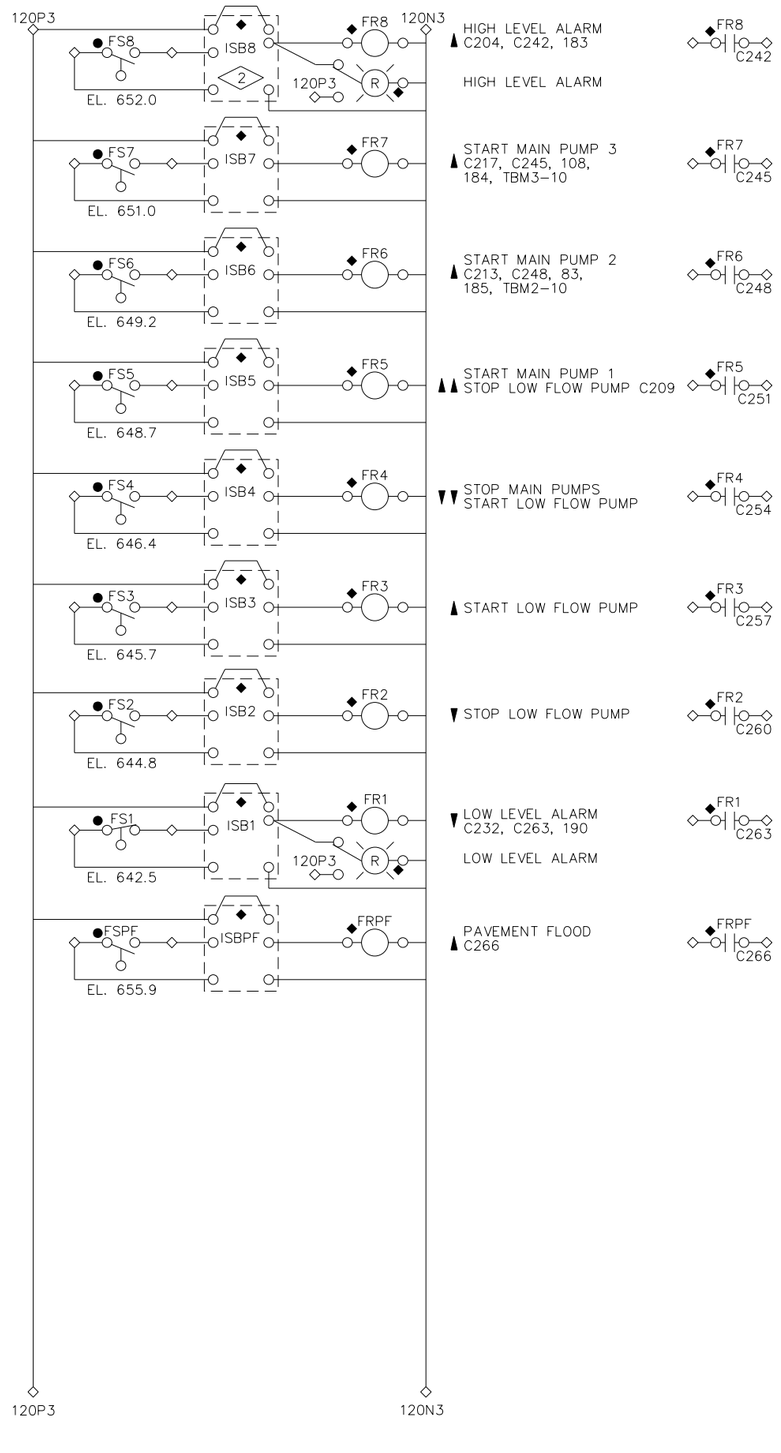
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

I & C CONTROL PANEL SCHEMATIC
PUMP STATION 38

SCALE: | SHEET OF 9 SHEETS | STA. | TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	274
		CONTRACT NO. 62B65		
	ILLINOIS FED. AID PROJECT			





GENERAL NOTES:

1. CONTROL CIRCUIT DRAWINGS DEPICT GENERAL DEVICE WIRING PRACTICES AND DOES NOT INCLUDE ALL CIRCUIT PROTECTIVE DEVICES SUCH AS FUSES, CIRCUIT BREAKERS, OR MOV'S. THESE DEVICES SHALL BE INCLUDED IN DETAILED DESIGN DRAWINGS BY CONTRACTOR.
2. CONTRACTOR SHALL PROVIDE CONTROL SCHEMATIC SHOP DRAWINGS DEPICTING AND IDENTIFYING TERMINALS AND WIRE NUMBERS ASSOCIATED WITH SCADA PANEL AND TERMINAL NUMBERS AS THEY ARE DEPICTED ON MANUFACTURER'S EQUIPMENT TERMINAL BLOCKS. COORDINATE PRIOR TO SUBMITTING SHOP DRAWINGS. ALL WIRED DEVICES SHALL BE COORDINATED, DEPICTED AND IDENTIFIED.

PLAN NOTES:

1. PLC FAIL OUTPUT. OUTPUT DE-ENERGIZES WHEN PRIMARY AND SECONDARY LEVEL ELEMENTS ARE OUT OF RANGE, AND/OR BOTH PLC PROCESSORS FAIL. SEE SPECIFICATION FOR DETAILS.
2. INTRINSICALLY SAFE BARRIER. ONE ISB PER FLOAT. TYPICAL, WIRE AND CONDUIT IN ACCORDANCE WITH NEC ARTICLE 504.
3. PILOT LIGHTS AND CONTROL MODE SELECTOR SWITCH SHOWN ON THIS SHEET ARE SHOWN ON IC7 AND IC8.

LEGEND:

- △ TERMINAL IN MCC
- ◇ TERMINAL IN SCADA PANEL
- ▲ DEVICE IN MCC
- ◆ DEVICE IN SCADA PANEL
- ● DEVICE FIELD MOUNTED
- ▲ RISING WATER LEVEL TRIGGER
- ▼ FALLING WATER LEVEL TRIGGER

IC10

FILE NAME = L:\7355\CAD\Sheets\Building\I&C\7355-PS38-IC10.dgn

KNIGHT Engineers & Architects

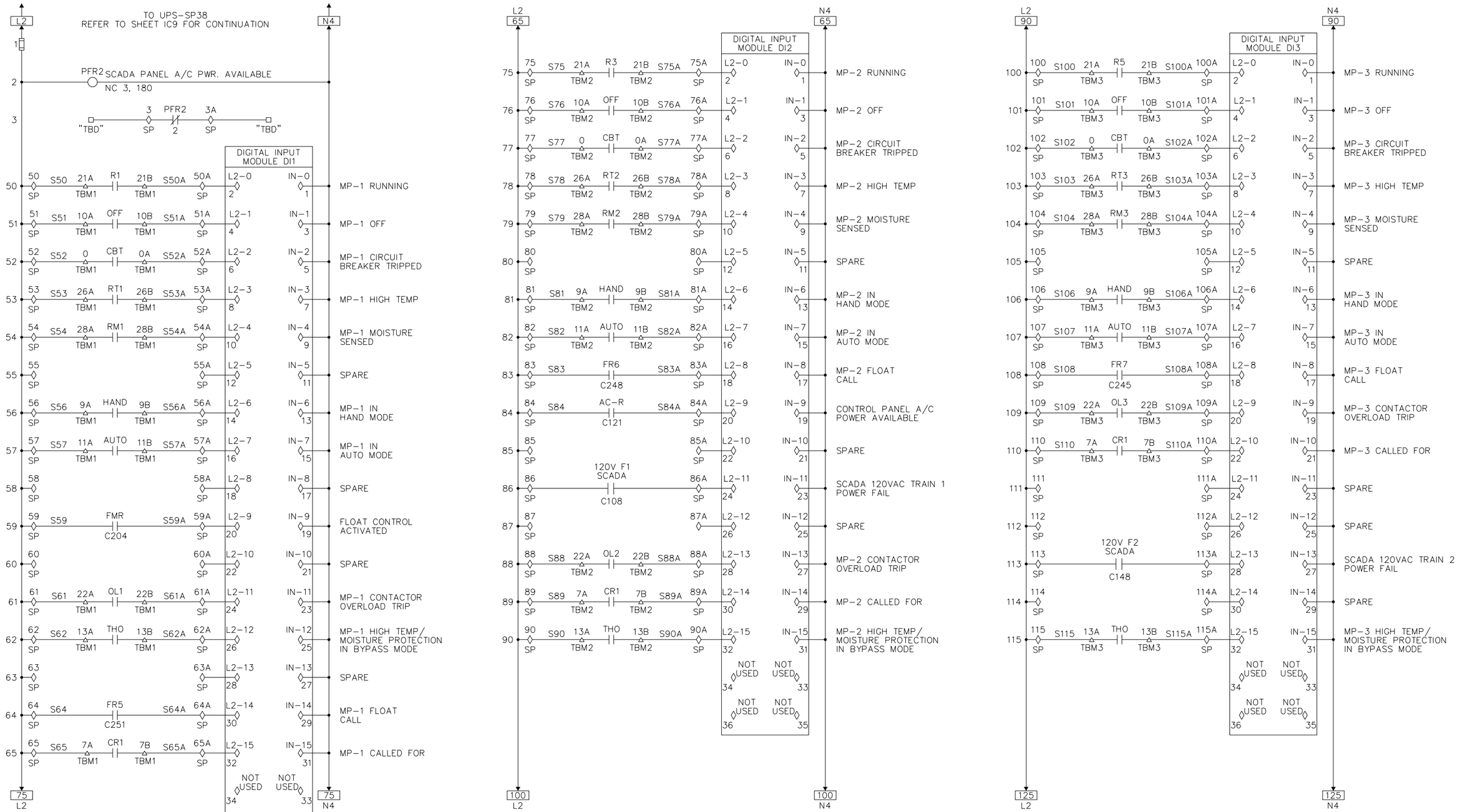
USER NAME = cliss	DESIGNED PNS	REVISED -
	DRAWN RAM	REVISED -
PLOT SCALE = 1@.166661	CHECKED JWM	REVISED -
PLOT DATE = 6/25/2020	DATE 06/26/20	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

I & C CONTROL PANEL SCHEMATIC
PUMP STATION 38

SCALE: | SHEET OF 10 SHEETS | STA. | TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	275
		CONTRACT NO. 62B65		
	ILLINOIS FED. AID PROJECT			



NOTES:

1. SEE SHEETS IC1 AND IC2 FOR INSTRUMENTATION SYMBOL LISTS, ABBREVIATIONS, AND GENERAL NOTES.
2. ALL INTERCONNECTING WIRES/CABLES BETWEEN PANELS SHALL TERMINATE ON TERMINAL STRIPS AND SHOULD NOT BE DIRECTLY CONNECTED TO DEVICES LOCATED IN THE PANELS.

IC11

FILE NAME = L:\7355\CAD\Sheets\Building\I&C\7355-PS38-IC11.dgn

KNIGHT
Engineers & Architects

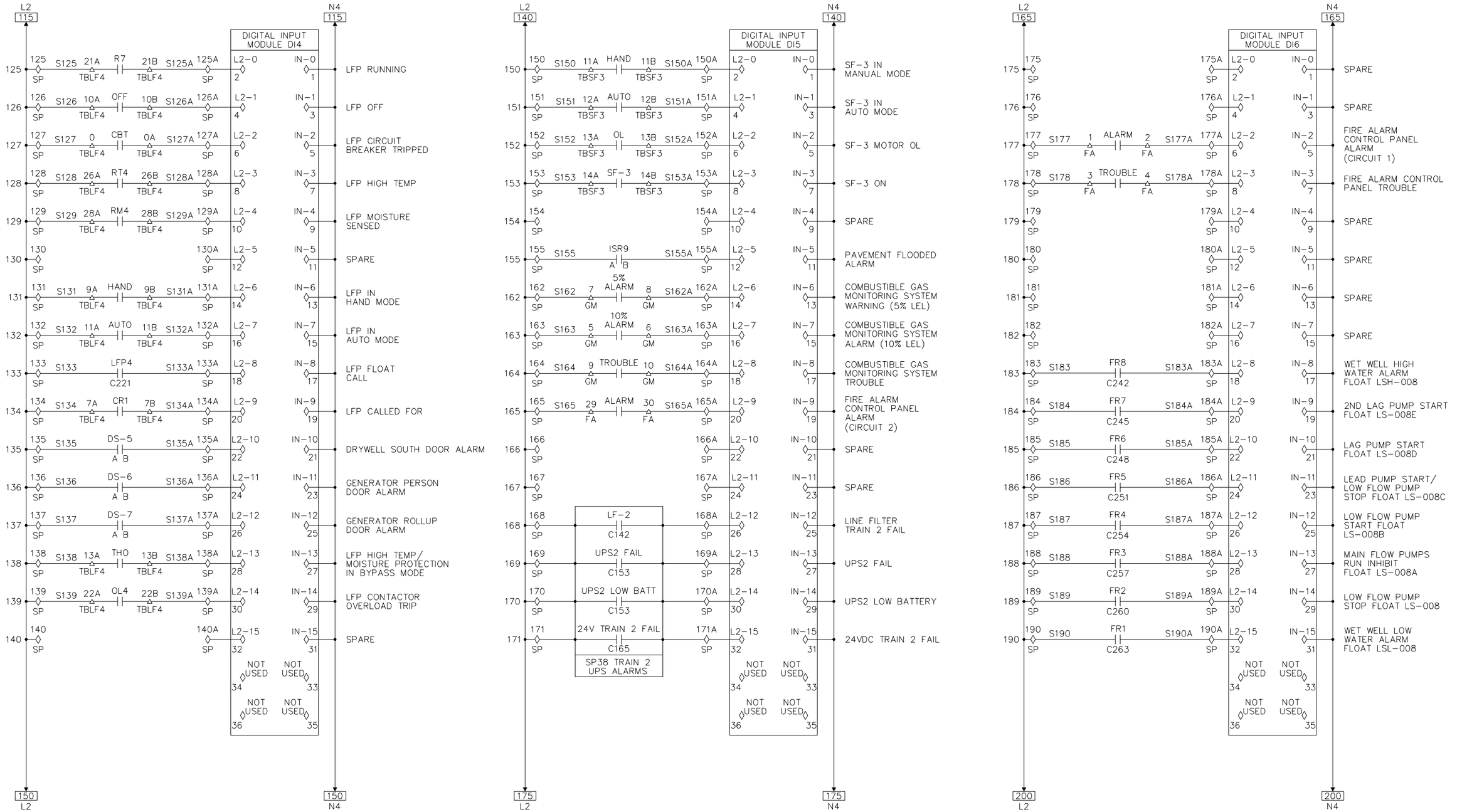
USER NAME = cliss	DESIGNED PNS	REVISED -
	DRAWN RAM	REVISED -
PLOT SCALE = 1:0.166661	CHECKED JWM	REVISED -
PLOT DATE = 6/25/2020	DATE 06/26/20	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

I & C SCADA PANEL SCHEMATIC & TERMINATION TABLE
PUMP STATION 38

SCALE: | SHEET OF 11 SHEETS | STA. | TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	276
		CONTRACT NO. 62B65		
	ILLINOIS FED. AID PROJECT			



NOTES:

1. SEE SHEETS IC1 AND IC2 FOR INSTRUMENTATION SYMBOL LISTS, ABBREVIATIONS, AND GENERAL NOTES.
2. ALL INTERCONNECTING WIRES/CABLES BETWEEN PANELS SHALL TERMINATE ON TERMINAL STRIPS AND SHOULD NOT BE DIRECTLY CONNECTED TO DEVICES LOCATED IN THE PANELS.

IC12

FILE NAME = L:\7355\CAD\Sheets\Building\I&C\7355-PS38-IC12.dgn

KNIGHT Engineers & Architects

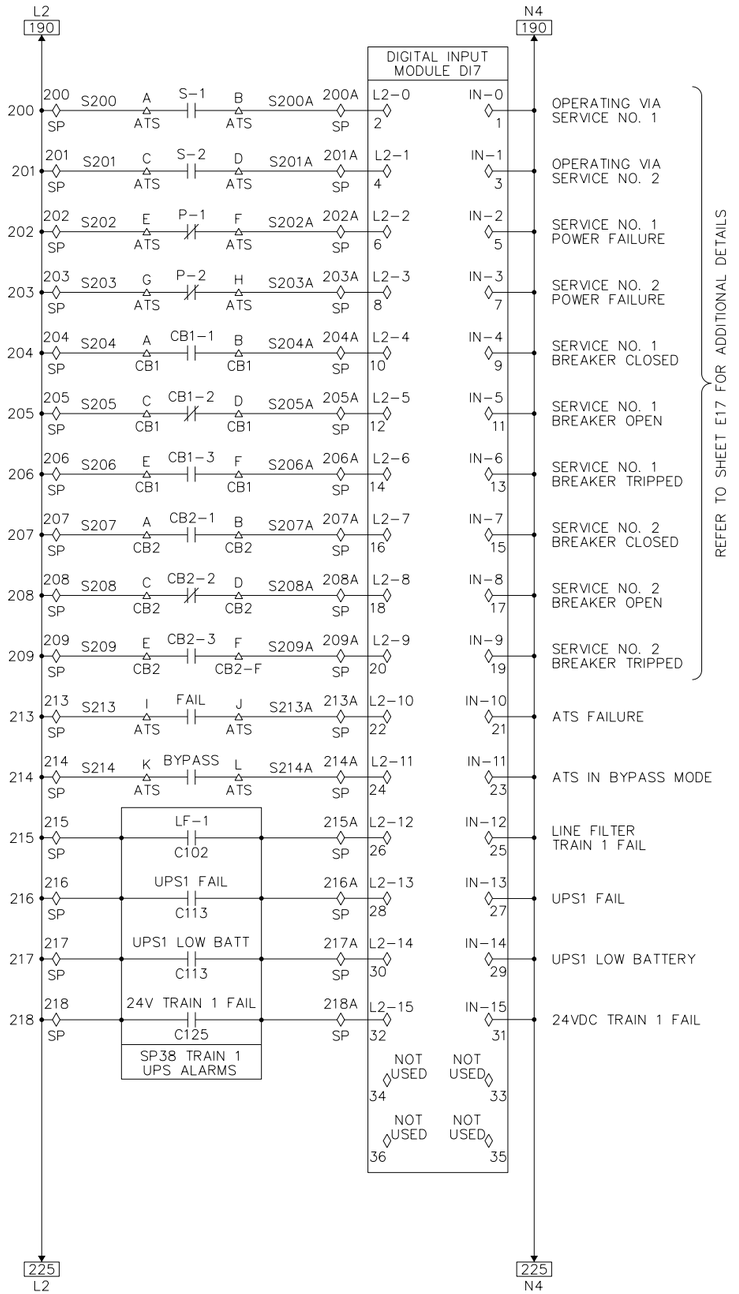
USER NAME = cliss	DESIGNED PNS	REVISED -
	DRAWN RAM	REVISED -
PLOT SCALE = 1:0.166658	CHECKED JWM	REVISED -
PLOT DATE = 6/25/2020	DATE 06/26/20	REVISED -

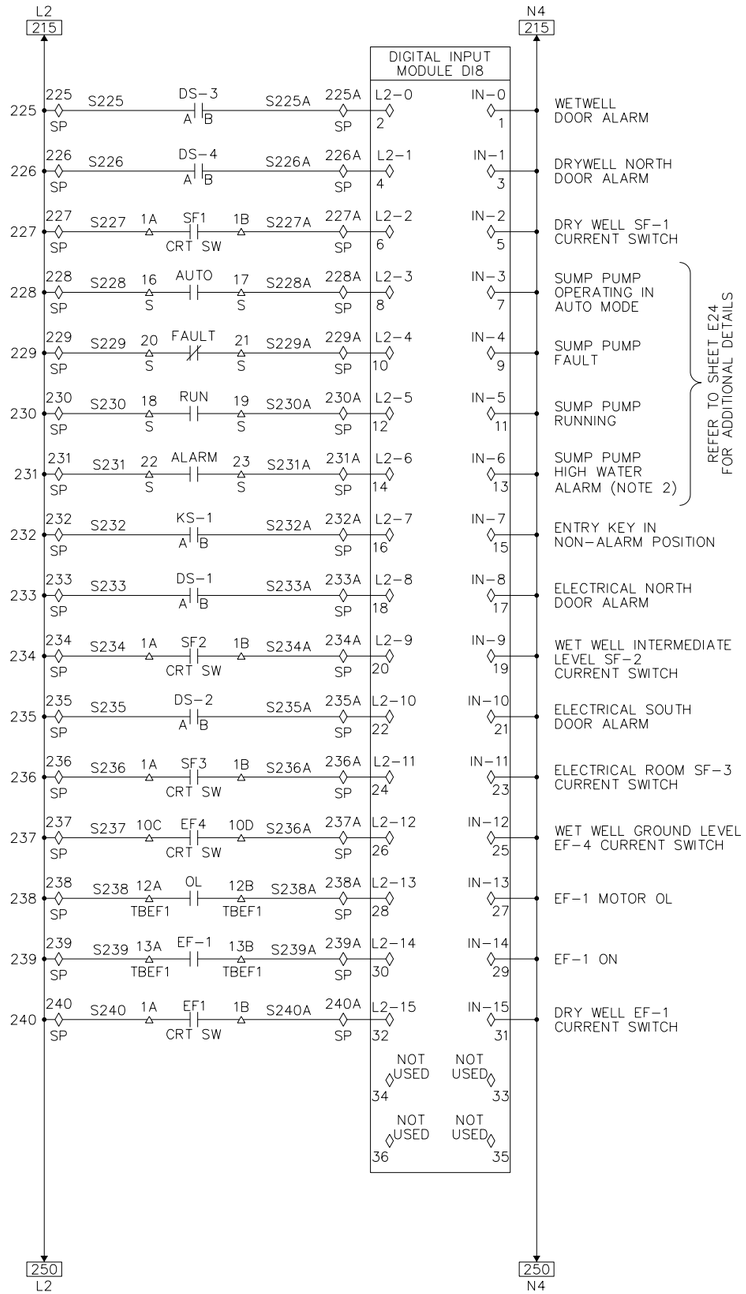
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

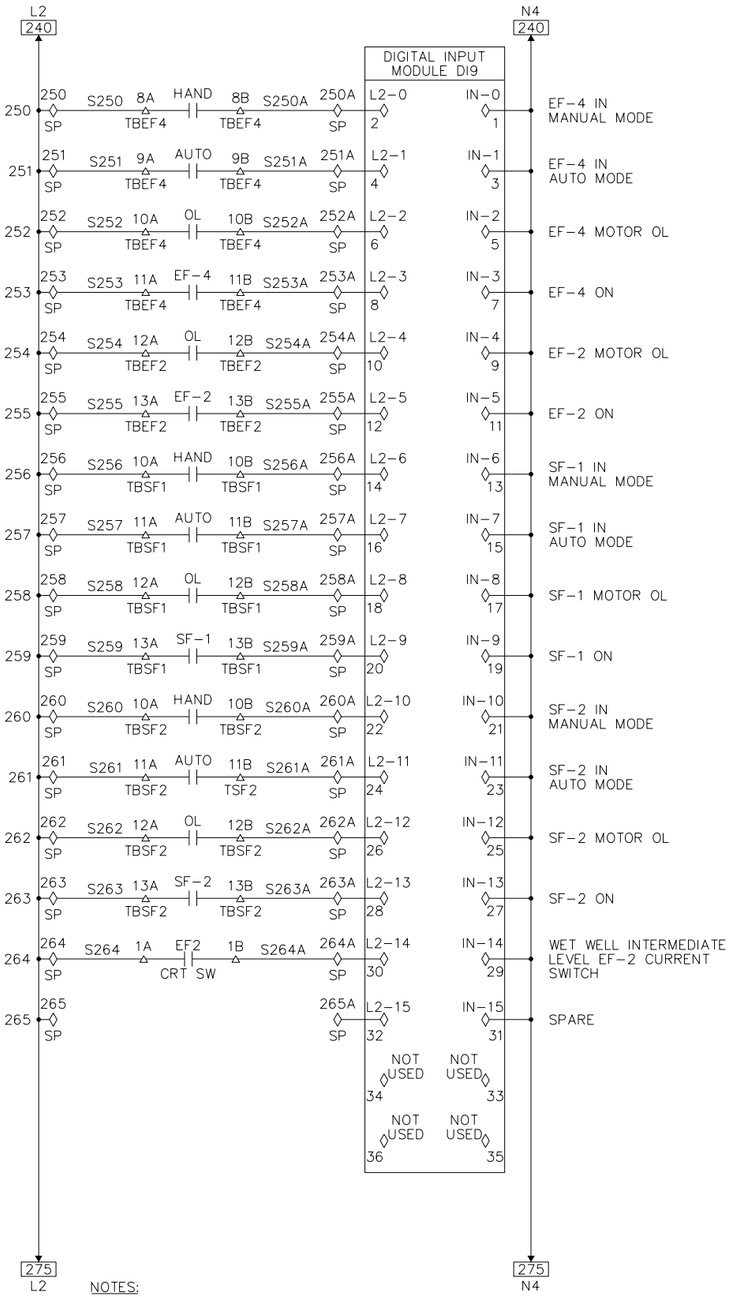
I & C CONTROL PANEL SCHEMATIC
PUMP STATION 38

SCALE: | SHEET OF 12 SHEETS | STA. | TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	277
		CONTRACT NO. 62B65		
	ILLINOIS FED. AID PROJECT			







NOTES:

1. SEE SHEETS IC1 AND IC2 FOR INSTRUMENTATION SYMBOL LISTS, ABBREVIATIONS, AND GENERAL NOTES.
2. THE HIGH WATER ALARM IS USED TO PROVIDE THE "DRY WELL FLOODING ALARM".
3. ALL INTERCONNECTING WIRES/CABLES BETWEEN PANELS SHALL TERMINATE ON TERMINAL STRIPS AND SHOULD NOT BE DIRECTLY CONNECTED TO DEVICES LOCATED IN THE PANELS.

IC13

FILE NAME = L:\7355\CAD\Sheets\Building\I&C\7355-PS38-IC13.dgn

KNIGHT Engineers & Architects

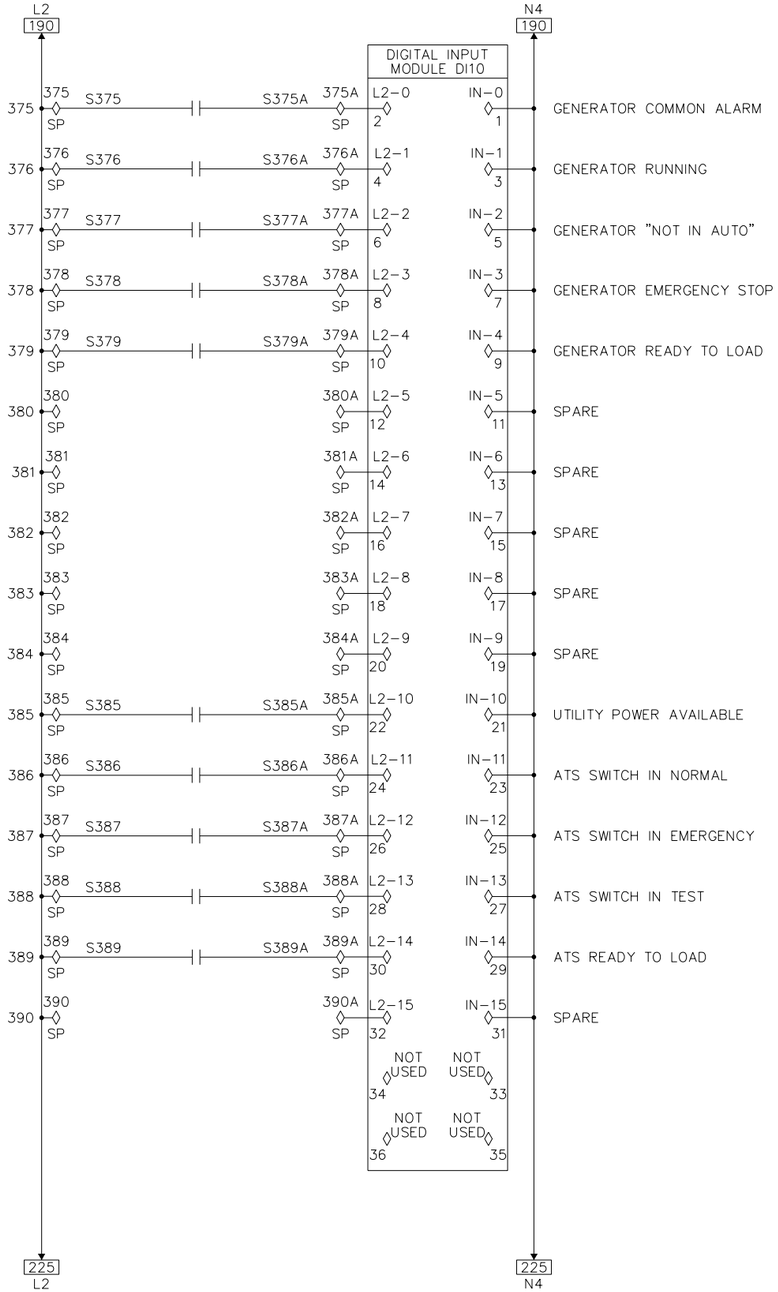
USER NAME = cliss	DESIGNED PNS	REVISED -
	DRAWN RAM	REVISED -
PLOT SCALE = 1:0.166661	CHECKED JWM	REVISED -
PLOT DATE = 6/25/2020	DATE 06/26/20	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

I & C CONTROL PANEL SCHEMATIC
PUMP STATION 38

SCALE: | SHEET OF 13 SHEETS | STA. | TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	278
		CONTRACT NO. 62B65		
	ILLINOIS FED. AID PROJECT			



NOTE:

1. CONTRACTOR TO DETERMINE HOW TO TERMINATE WIRES ON BOTH ATS AND GENERATOR.

IC14

FILE NAME = L:\7355\CAD\Sheets\Building\I&C7355-FS38-IC14.dgn

KNIGHT
Engineers & Architects

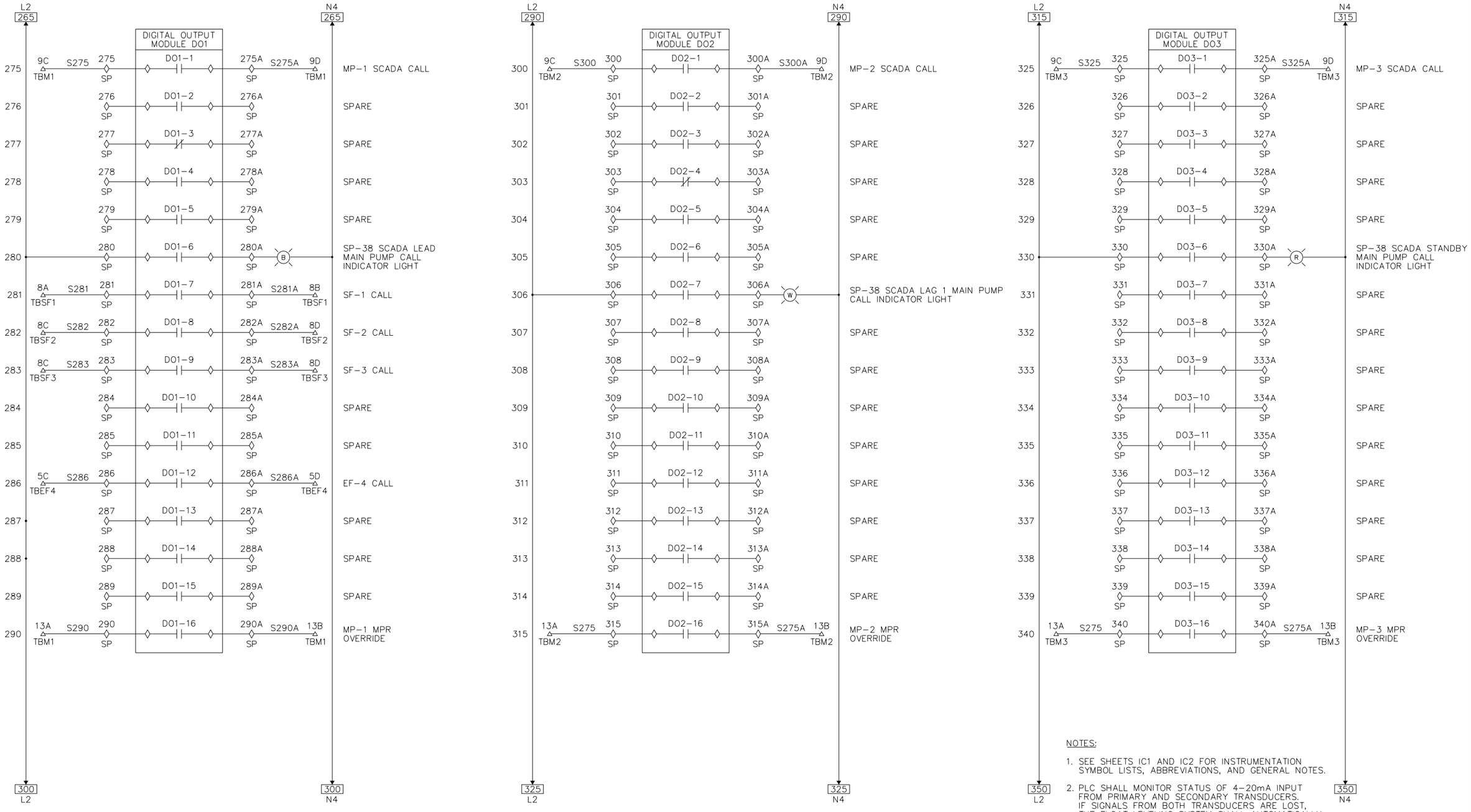
USER NAME = cliss	DESIGNED PNS	REVISED -
	DRAWN RAM	REVISED -
PLOT SCALE = 1:0.166661	CHECKED JWM	REVISED -
PLOT DATE = 6/25/2020	DATE 06/26/20	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

I & C CONTROL PANEL SCHEMATIC
PUMP STATION 38

SCALE: | SHEET OF 13 SHEETS | STA. | TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	279
		CONTRACT NO. 62B65		
	ILLINOIS FED. AID PROJECT			



NOTES:

1. SEE SHEETS IC1 AND IC2 FOR INSTRUMENTATION SYMBOL LISTS, ABBREVIATIONS, AND GENERAL NOTES.
2. PLC SHALL MONITOR STATUS OF 4-20mA INPUT FROM PRIMARY AND SECONDARY TRANSDUCERS. IF SIGNALS FROM BOTH TRANSDUCERS ARE LOST, THE FLOAT LEVELING SYSTEM SHALL AUTOMATICALLY TAKE OVER CONTROL OF PUMP OPERATION. NORMALLY CLOSED CONTACTS SHALL OPEN WHEN TRANSDUCER SIGNAL IS AVAILABLE.
3. ALL INTERCONNECTING WIRES/CABLES BETWEEN PANELS SHALL TERMINATE ON TERMINAL STRIPS AND SHOULD NOT BE DIRECTLY CONNECTED TO DEVICES LOCATED IN THE PANELS.

IC15

FILE NAME = L:\7355\CAD\Sheets\Building\I&C7355-PS38-IC15.dgn

KNIGHT
Engineers & Architects

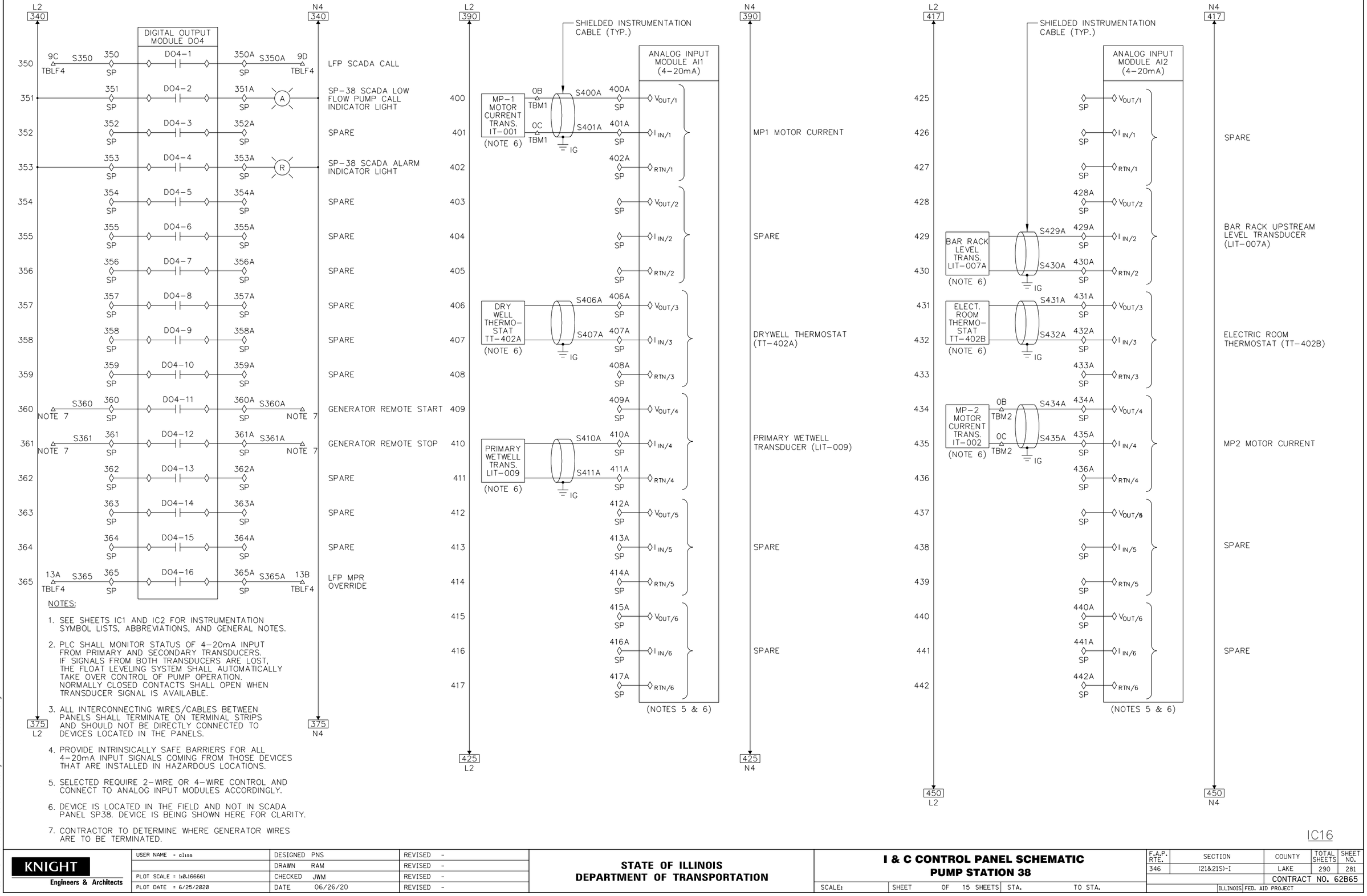
USER NAME = cliss	DESIGNED PNS	REVISED -
	DRAWN RAM	REVISED -
PLOT SCALE = 1:0.166661	CHECKED JWM	REVISED -
PLOT DATE = 6/25/2020	DATE 06/26/20	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

I & C CONTROL PANEL SCHEMATIC
PUMP STATION 38

SCALE: | SHEET OF 14 SHEETS | STA. | TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	280
		CONTRACT NO. 62B65		
	ILLINOIS FED. AID PROJECT			



NOTES:

1. SEE SHEETS IC1 AND IC2 FOR INSTRUMENTATION SYMBOL LISTS, ABBREVIATIONS, AND GENERAL NOTES.
2. PLC SHALL MONITOR STATUS OF 4-20mA INPUT FROM PRIMARY AND SECONDARY TRANSDUCERS. IF SIGNALS FROM BOTH TRANSDUCERS ARE LOST, THE FLOAT LEVELING SYSTEM SHALL AUTOMATICALLY TAKE OVER CONTROL OF PUMP OPERATION. NORMALLY CLOSED CONTACTS SHALL OPEN WHEN TRANSDUCER SIGNAL IS AVAILABLE.
3. ALL INTERCONNECTING WIRES/CABLES BETWEEN PANELS SHALL TERMINATE ON TERMINAL STRIPS AND SHOULD NOT BE DIRECTLY CONNECTED TO DEVICES LOCATED IN THE PANELS.
4. PROVIDE INTRINSICALLY SAFE BARRIERS FOR ALL 4-20mA INPUT SIGNALS COMING FROM THOSE DEVICES THAT ARE INSTALLED IN HAZARDOUS LOCATIONS.
5. SELECTED REQUIRE 2-WIRE OR 4-WIRE CONTROL AND CONNECT TO ANALOG INPUT MODULES ACCORDINGLY.
6. DEVICE IS LOCATED IN THE FIELD AND NOT IN SCADA PANEL SP38. DEVICE IS BEING SHOWN HERE FOR CLARITY.
7. CONTRACTOR TO DETERMINE WHERE GENERATOR WIRES ARE TO BE TERMINATED.

IC16

FILE NAME = L:\7355\CAD\Sheets\Building\I&C\7355-PS38-IC16.dgn

KNIGHT
Engineers & Architects

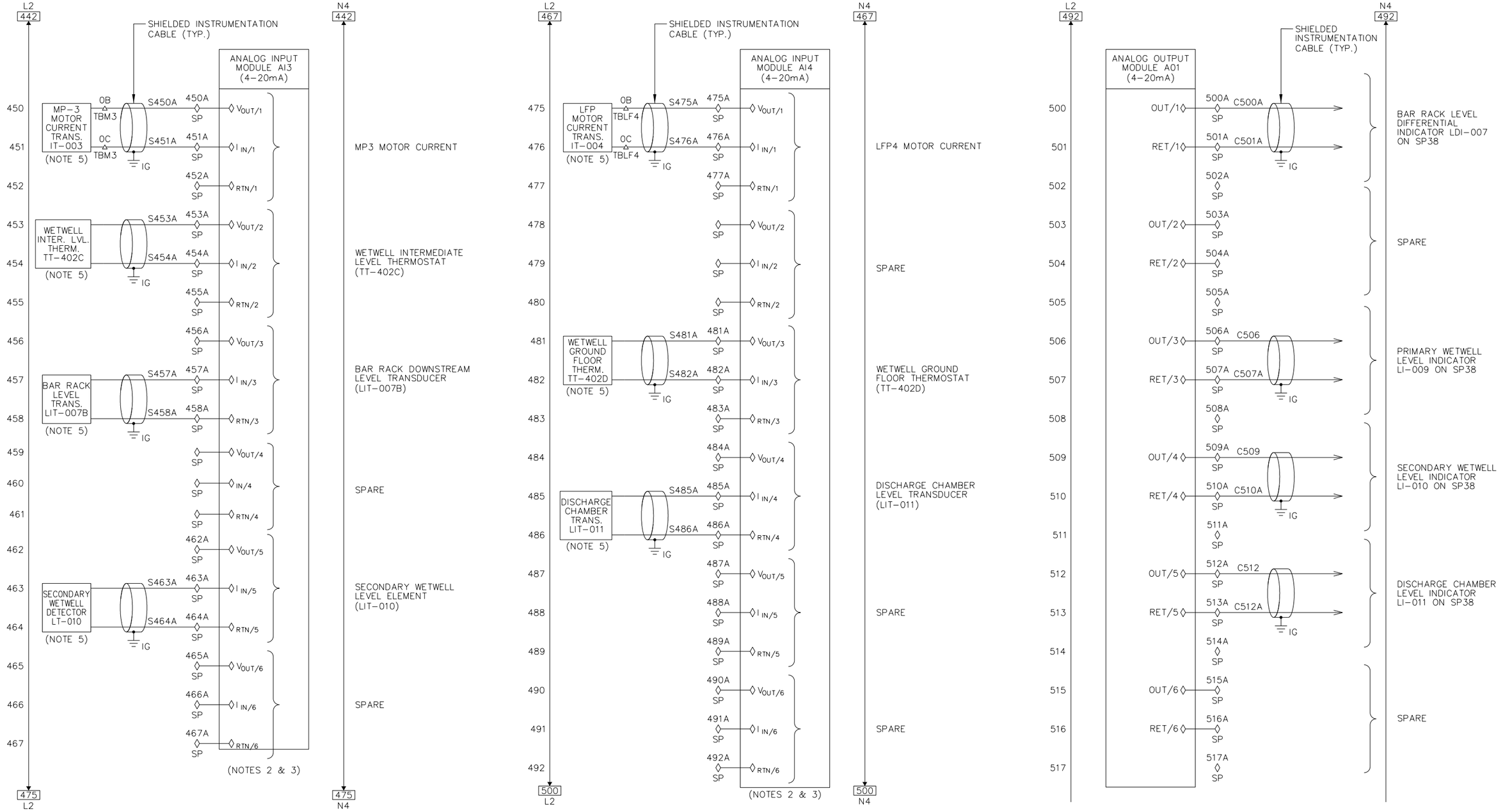
USER NAME = cliss	DESIGNED PNS	REVISED -
	DRAWN RAM	REVISED -
PLOT SCALE = 1#0.166661	CHECKED JWM	REVISED -
PLOT DATE = 6/25/2020	DATE 06/26/20	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

I & C CONTROL PANEL SCHEMATIC
PUMP STATION 38

SCALE: | SHEET OF 15 SHEETS | STA. | TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	281
		CONTRACT NO. 62B65		
	ILLINOIS FED. AID PROJECT			



NOTES:

1. SEE SHEETS IC1 AND IC2 FOR INSTRUMENTATION SYMBOL LISTS, ABBREVIATIONS, AND GENERAL NOTES.
2. PROVIDE INTRINSICALLY SAFE BARRIERS FOR ALL 4–20mA INPUT SIGNALS COMING FROM THOSE DEVICES THAT ARE INSTALLED IN HAZARDOUS LOCATIONS.
3. CONTRACTOR TO VERIFY IF FIELD DEVICES SELECTED REQUIRE 2–WIRE OR 4–WIRE CONTROL AND CONNECT TO ANALOG INPUT MODULES ACCORDINGLY.
4. ALL INTERCONNECTING WIRES/CABLES BETWEEN PANELS SHALL TERMINATE ON TERMINAL STRIPS AND SHOULD NOT BE DIRECTLY CONNECTED TO DEVICES LOCATED IN THE PANELS.
5. DEVICE IS LOCATED IN THE FIELD AND NOT IN SCADA PANEL SP38. DEVICE IS BEING SHOWN HERE FOR CLARITY.

FILE NAME = L:\7355\CAD\Sheets\Building\I&C\7355-PS38-IC17.dgn

KNIGHT Engineers & Architects

USER NAME = cliss	DESIGNED PNS	REVISED -
	DRAWN RAM	REVISED -
PLOT SCALE = 1:0.166661	CHECKED JWM	REVISED -
PLOT DATE = 6/25/2020	DATE 06/26/20	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

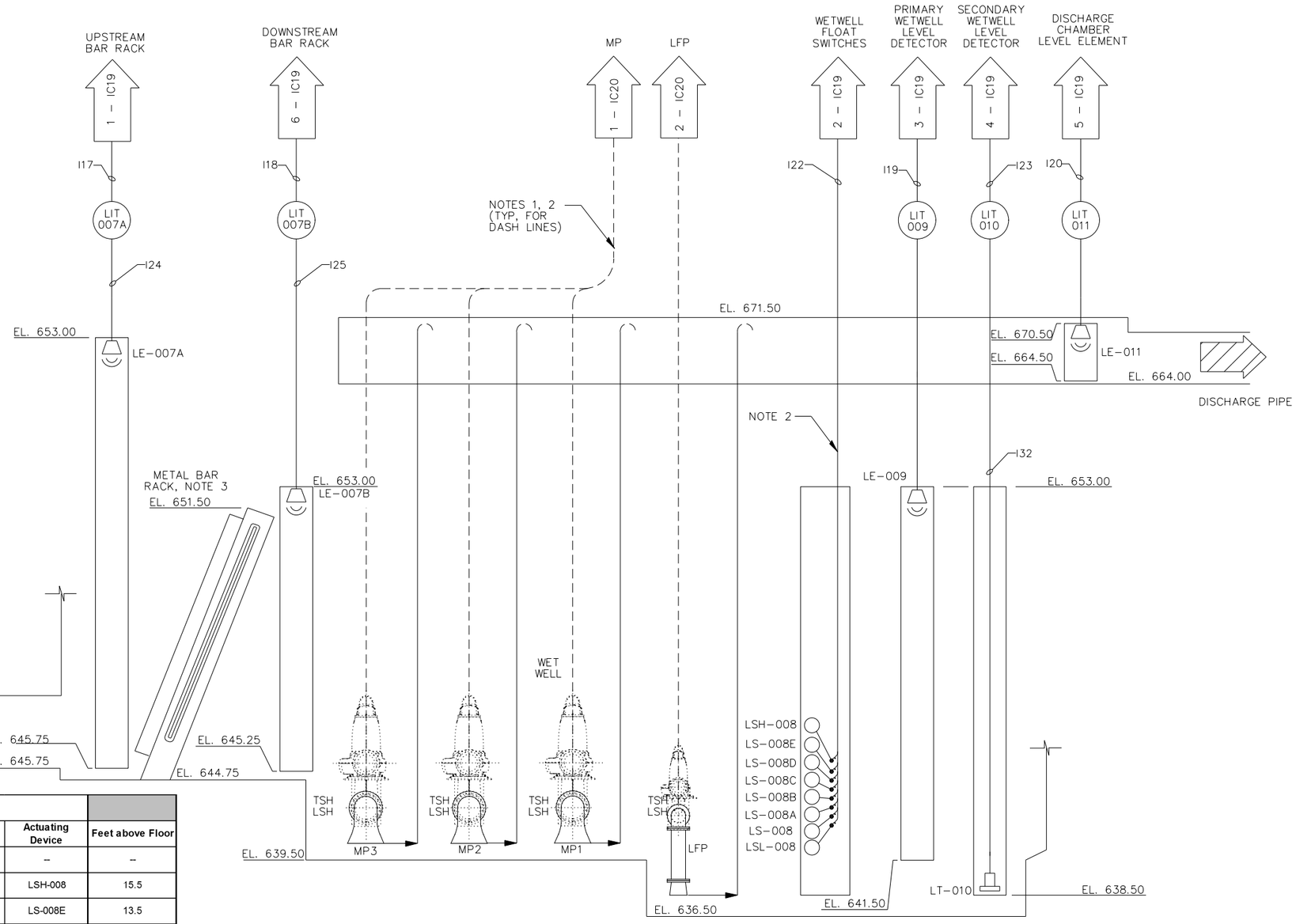
I & C CONTROL PANEL SCHEMATIC
PUMP STATION 38

SCALE: | SHEET OF 16 SHEETS | STA. | TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	282
		CONTRACT NO. 62B65		
	ILLINOIS FED. AID PROJECT			

NOTES:

1. MANUFACTURER'S CABLES.
2. FOR DESCRIPTION OF INSTRUMENT DEVICES ASSOCIATED WITH MINI-CAS RELAY, SEE ELECTRICAL DRAWINGS.
3. FOR DESCRIPTION OF CLOGGED BAR SCREEN ALARM GENERATION, SEE SPECIFICATION 40 90 05.
4. SEE SHEET IC25 FOR CABLE/CONDUIT SCHEDULE.



PLC Control				Float Mode Control				
Elevation	Rising Level Action	Falling Level Action	Feet above Floor	Rising Level Action	Falling Level Action	Elevation	Actuating Device	Feet above Floor
654.6	Pavement Flooded Alarm	--	18.1	--	--	--	--	--
652.0	Wet Well High Level Alarm	--	15.5	High Level Alarm	--	652.0	LSH-008	15.5
--	--	--	--	** Start Main Pump 3		650.0	LS-008E	13.5
649.2	* Start Lag Main Pump	--	12.7	Start Main Pump 2	--	649.2	LS-008D	12.7
648.7	* Start Lead Main Pump	--	12.2	Start Main Pump 1	--	648.7	LS-008C	12.2
	Stop Low Flow Pump	--		Stop Low Flow Pump	--			
646.4	--	Stop Main Pumps	9.9	--	Stop Main Pumps	646.4	LS-008B	9.9
	--	Start Low Flow Pump		--	Start Low Flow Pump			
645.7	Start Low Flow Pump	--	9.2	Start Low Flow Pump	--	645.7	LS-008A	9.2
644.8	--	Stop Low Flow Pump	8.3	--	Stop Low Flow Pump	644.8	LS-008	8.3
642.5	--	Wet Well Low Level Alarm	6.0	--	Wet Well Low Level Alarm	642.5	LSL-008	6.0
* Standby Pump shall immediately replace a failed pump				** Main Pump 3 shall only start if Main Pump 1 or 2 has failed and elevation has reached 650				
636.5	LFP sump floor elevation							

IC18

FILE NAME = L:\7355\CAD\Sheets\Building\I&C\7355-FP528-IC18.dgn

KNIGHT Engineers & Architects

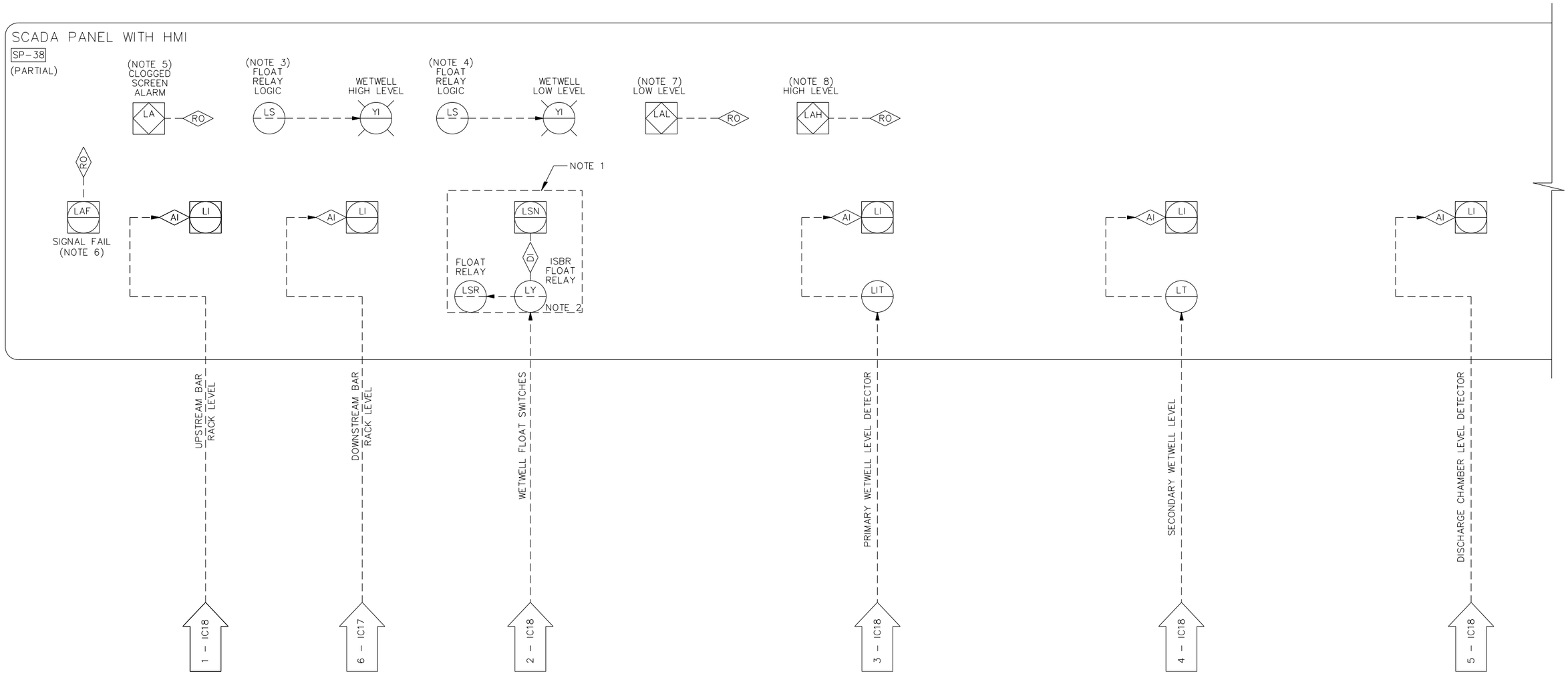
USER NAME = cliss	DESIGNED PNS	REVISED -
	DRAWN RAM	REVISED -
PLOT SCALE = 1:0.166661	CHECKED JWM	REVISED -
PLOT DATE = 6/25/2020	DATE 06/26/20	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

I & C PROCESS AND INSTRUMENTATION DIAGRAM
PUMP STATION 38

SCALE: | SHEET OF 17 SHEETS | STA. | TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	283
		CONTRACT NO. 62B65		
	ILLINOIS FED. AID PROJECT			



NOTES:

1. TYPICAL FLOAT RELAY IS SHOWN. ARRANGEMENT IS TYPICAL FOR 8 CORRESPONDING FLOATS LSL-008, LS-008, LS-008A THROUGH LS-008E, AND LSH-008.
2. FLOAT RELAYS PART OF FLOAT SWITCH RELAY LOGIC FOR PUMP CONTROL AND LEVEL TRANSMITTER SIGNAL VERIFICATION.
3. FLOAT RELAY LOGIC BASED ON LSH-008.
4. FLOAT RELAY LOGIC BASED ON LSL-008.
5. METAL BAR RACK BLOCKAGE ALARM GENERATED BY PLC SOFTWARE LOGIC IN THE EVENT THAT DIFFERENTIAL MEASUREMENTBETWEEN UPSTREAM (LIT-007A) AND DOWNSTREAM (LIT-007B) EXCEEDS 18".
6. ALARM GENERATED BY PLC SOFTWARE LOGIC IN THE EVENT THAT HYDROSTATIC AND ULTRASONIC LEVEL SIGNALS ARE NOT VALIDATED BY BACKUP FLOAT SIGNALS.
7. WET WELL LOW LEVEL ALARM GENERATED BY PLC SOFTWARE LOGIC BASED ON LIT009, LIT010 AND LSL-008.
8. WET WELL HIGH LEVEL ALARM GENERATED BY PLC SOFTWARE LOGIC BASED ON LIT009, LIT010 AND LSH-008.

FILE NAME = L:\7355\CAD\Sheets\Building\IC\7355-PS38-IC19.dgn

KNIGHT Engineers & Architects

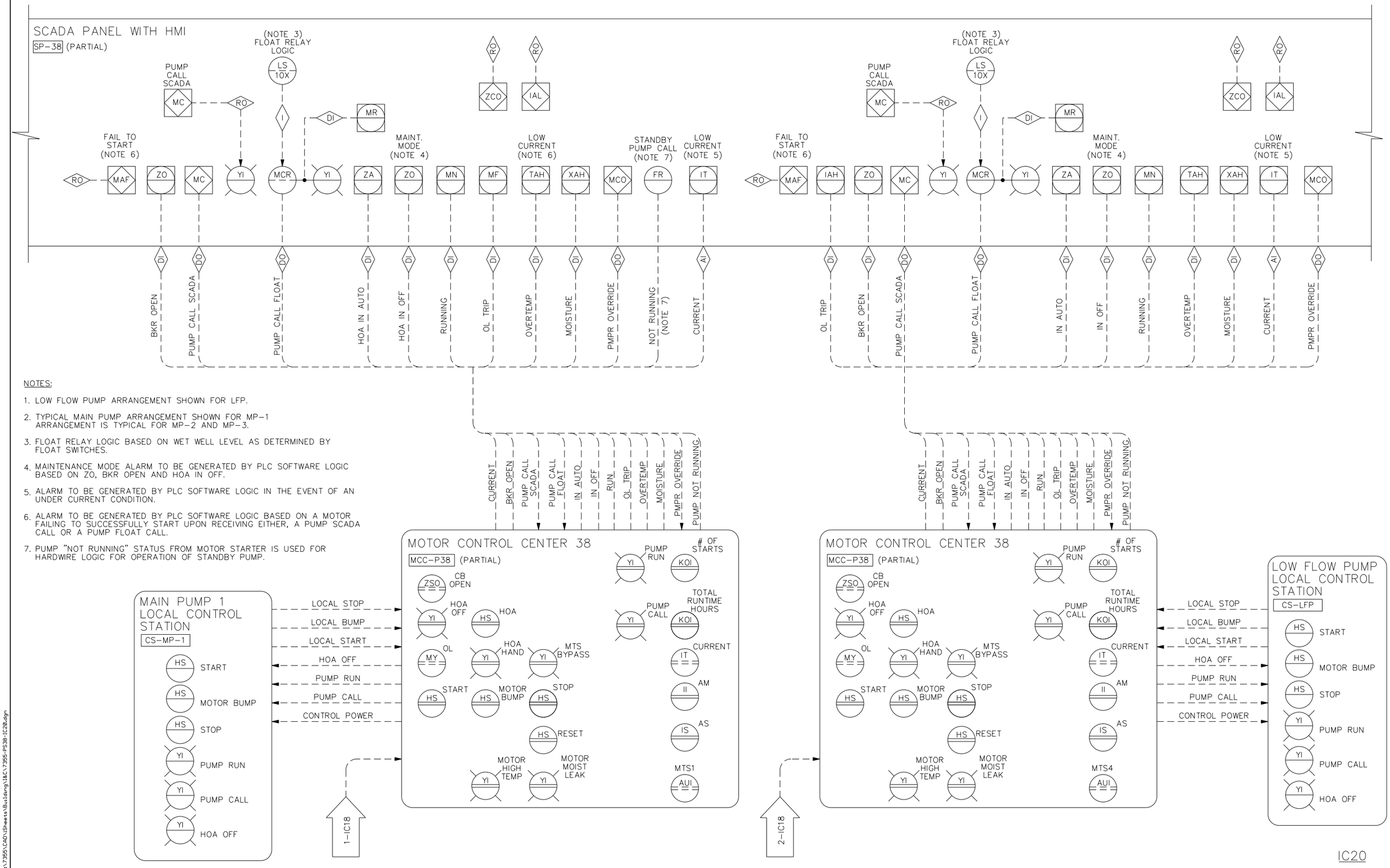
USER NAME = cliss	DESIGNED PNS	REVISED -
	DRAWN RAM	REVISED -
PLOT SCALE = 1:2.166661	CHECKED JWM	REVISED -
PLOT DATE = 6/25/2020	DATE 06/26/20	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

I & C MAIN FLOW PUMP NO. 1 P&ID DRAWING
PUMP STATION 38

SCALE: | SHEET OF 18 SHEETS | STA. | TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	284
		CONTRACT NO. 62B65		
		ILLINOIS FED. AID PROJECT		



NOTES:

1. LOW FLOW PUMP ARRANGEMENT SHOWN FOR LFP.
2. TYPICAL MAIN PUMP ARRANGEMENT SHOWN FOR MP-1 ARRANGEMENT IS TYPICAL FOR MP-2 AND MP-3.
3. FLOAT RELAY LOGIC BASED ON WET WELL LEVEL AS DETERMINED BY FLOAT SWITCHES.
4. MAINTENANCE MODE ALARM TO BE GENERATED BY PLC SOFTWARE LOGIC BASED ON ZO, BKR OPEN AND HOA IN OFF.
5. ALARM TO BE GENERATED BY PLC SOFTWARE LOGIC IN THE EVENT OF AN UNDER CURRENT CONDITION.
6. ALARM TO BE GENERATED BY PLC SOFTWARE LOGIC BASED ON A MOTOR FAILING TO SUCCESSFULLY START UPON RECEIVING EITHER, A PUMP SCADA CALL OR A PUMP FLOAT CALL.
7. PUMP "NOT RUNNING" STATUS FROM MOTOR STARTER IS USED FOR HARDWIRE LOGIC FOR OPERATION OF STANDBY PUMP.

IC20

FILE NAME = L:\7355\CADD\Sheets\Building\I&C\7355-PS38-IC20.dgn

KNIGHT Engineers & Architects

USER NAME = cliss	DESIGNED PNS	REVISED -
	DRAWN RAM	REVISED -
PLOT SCALE = 1:0.166661	CHECKED JWM	REVISED -
PLOT DATE = 6/25/2020	DATE 06/26/20	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

I & C MAIN FLOW PUMP NO. 2 P&ID DRAWING
PUMP STATION 38

SCALE: | SHEET OF 19 SHEETS | STA. | TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	285
		CONTRACT NO. 62B65		
	ILLINOIS FED. AID PROJECT			

SCADA PANEL WITH HMI

SP-38 (PARTIAL)

GENERATOR

- ALARM — LSL
- NOT IN AUTO — YL
- COMMON ALARM — YL
- E-STOP — YA
- RUN — YL
- # OF STARTS — XR
- OUT OF SERVICE — YL
- TOTAL RUNTIME HOURS — ETM

TRANSFER SWITCH

- GROUND FAULT — YA (2)
- CB CLOSED — YA (2)
- ATS POSITION — YL (2)
- UTILITY SERVICE FAILURE — YA (2)

DI signals:

- GENERATOR NOT IN AUTO
- GENERATOR COMMON ALARM
- GENERATOR E-STOP
- GENERATOR READY TO LOAD
- GENERATOR RUNNING
- UTILITY POWER AVAILABLE
- NORMAL ELECTRIC SERVICE (COMED) MAIN BREAKER CLOSED
- NORMAL ELECTRICAL SERVICE (COMED) MAIN BREAKER TRIPPED
- NORMAL ELECTRICAL SERVICE (COMED) FAILURE
- NORMAL ELECTRICAL SERVICE (COMED) GROUND FAULT
- EMERGENCY ELECTRICAL SERVICE (GENERATOR) MAIN BREAKER CLOSED
- EMERGENCY ELECTRICAL SERVICE (GENERATOR) MAIN BREAKER TRIPPED
- EMERGENCY ELECTRICAL SERVICE (GENERATOR) GROUND FAULT
- ATS IN NORMAL POWER SOURCE POSITION VERIFIED
- ATS IN EMERGENCY POWER SOURCE POSITION VERIFIED
- ATS IN TEST MODE
- ATS READY TO LOAD

EMERGENCY GENERATOR

- REMOTE START
- READY TO LOAD
- REMOTE STOP

MOTOR CONTROL CENTER 38

MCC-P38 (PARTIAL)

MAIN BREAKERS

- GROUND FAULT — YL (2)
- VOLTAGE PRESENT — YL (2)
- POWER MONITOR — JM (2)
- CB — HS (2)

TRANSFER SWITCH

- XFER CONNECTED EMERG — YL
- XFER CONNECTED NORMAL — YL
- EMERG SOURCE AVAILABLE — YL
- NORMAL SOURCE AVAILABLE — YL
- RETRANSFER OFF TRANSFER — HS

THE FOLLOWING DATA (DERIVED VIA DUAL POWER MONITORS) SHALL BE DISPLAYED AND TRENDED AT SCADA:

1. NORMAL LINE-LINE VOLTAGE
2. EMERGENCY LINE-LINE VOLTAGE
3. NORMAL LINE CURRENT
4. EMERGENCY LINE CURRENT
5. NORMAL LINE POWER (KW)
6. EMERGENCY LINE POWER (KW)
7. NORMAL LINE POWER FACTOR

IC21

FILE NAME = L:\7355\CAD\Sheets\Building\I&C\7355-PS38-IC21.dgn

KNIGHT Engineers & Architects

USER NAME = cliss	DESIGNED PNS	REVISED -
	DRAWN RAM	REVISED -
PLOT SCALE = 1#0.166661	CHECKED JWM	REVISED -
PLOT DATE = 6/25/2020	DATE 06/26/20	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

I & C MAIN FLOW PUMP NO. 3 P&ID DRAWING
PUMP STATION 38

SCALE: | SHEET OF 20 SHEETS | STA. | TO STA.

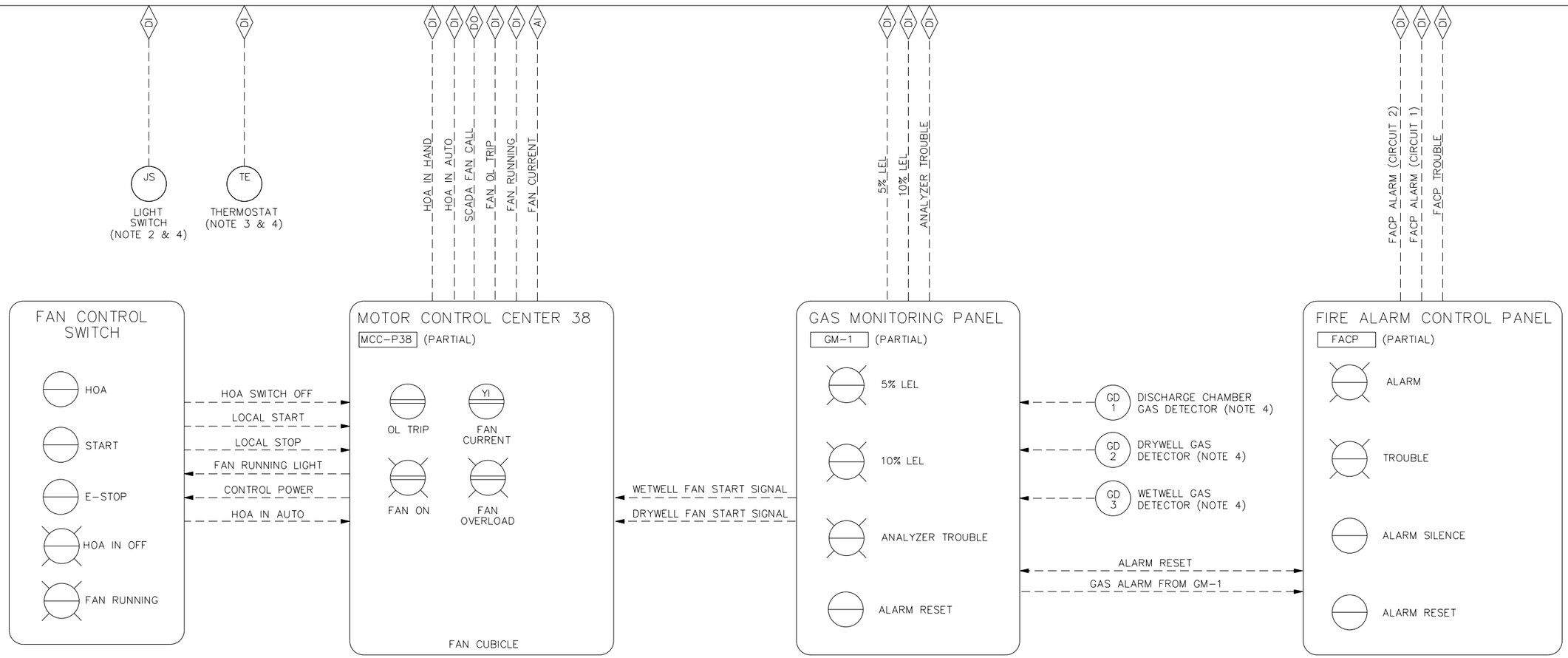
F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	286
		CONTRACT NO. 62B65		
	ILLINOIS FED. AID PROJECT			

SCADA PANEL WITH HMI

SP-38 (PARTIAL)

NOTES:

1. VENTILATION RUNNING LIGHT BY WETWELL DOOR AND DRYWELL DOOR, LIT WHEN THE SPACE VENTILATION SYSTEM IS RUNNING. SEE SHEET E13.
2. WETWELL AND DRYWELL LIGHT SWITCHES ARE DOUBLE POLE, DOUBLE THROW. ONE CIRCUIT FOR LIGHTS, ONE CIRCUIT FOR SCADA INPUT. SEE SHEET E10.
3. THERMOSTATS CONTROL FANS PER THE TABLE BELOW.
4. PROVIDE INTRINSICALLY SAFE RELAYS AND BARRIERS FOR CONTROL AND INSTRUMENT CABLES RUN FROM HAZARDOUS LOCATIONS INTO CONTROL PANELS, AS REQUIRED TO INSURE SAFE OPERATION IN HAZARDOUS LOCATIONS.



LOCATION	FANS	DESCRIPTION	THERMOSTAT ID (NOTE 3)	GM-1 INPUT	LIGHT SWITCH INPUT (NOTE 2)	VENTILATION RUN LIGHT (NOTE 1)
DRYWELL	SF-1/EF-1	DRYWELL INTERMEDIATE LEVEL FANS	TT-402A	Y	Y	Y
WETWELL	SF-2/EF-2	WETWELL INTERMEDIATE LEVEL FANS	TT-402C	Y	Y	Y
WETWELL	EF-4	WETWELL GROUND LEVEL FAN	TT-402D	Y		
ELECTRIC ROOM	SF-3	ELECTRIC ROOM FAN	TT-402B	N	N	N

IC22

FILE NAME = L:\7355\CADD\Sheets\Building\I&C\7355-PS38-IC22.dgn

KNIGHT Engineers & Architects

USER NAME = cliss	DESIGNED PNS	REVISED -
	DRAWN RAM	REVISED -
PLOT SCALE = 1:0.166661	CHECKED JWM	REVISED -
PLOT DATE = 6/25/2020	DATE 06/26/20	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

I & C MAIN FLOW PUMP NO. 4 P&ID DRAWING
PUMP STATION 38

SCALE: | SHEET OF 21 SHEETS | STA. | TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	287
		CONTRACT NO. 62B65		
	ILLINOIS FED. AID PROJECT			

SCADA PANEL WITH HMI

SP-38 (PARTIAL)

NOTES:

1. VENTILATION RUNNING LIGHT BY WETWELL DOOR AND DRYWELL DOOR, LIT WHEN THE SPACE VENTILATION SYSTEM IS RUNNING.
2. WETWELL AND DRYWELL LIGHT SWITCHES ARE DOUBLE POLE, DOUBLE THROW. ONE CIRCUIT FOR LIGHTS, ONE CIRCUIT FOR SCADA INPUT.
3. THERMOSTATS CONTROL FANS IN THEIR RESPECTIVE SPACES.
4. PROVIDE INTRINSICALLY SAFE RELAYS AND BARRIERS FOR CONTROL AND INSTRUMENT CABLES RUN FROM HAZARDOUS LOCATIONS INTO CONTROL PANELS, AS REQUIRED TO INSURE SAFE OPERATION IN HAZARDOUS LOCATIONS.
5. DOOR LIMIT SWITCH REPRESENTS 7 FACILITY ACCESS DOORS. REFER TO E13 & E14 FOR LOCATIONS AND TAG IDS.
6. CURRENT SWITCH (E-10) PROVIDES THE INPUT TO SCADA (IC-13).

DI

HOA IN AUTO

SUMP PUMP FAULT

SUMP PUMP RUNNING

DRYWELL FLOODING ALARM

ZS

OCCUPANCY KEY SWITCH (KS-1)

ZS

DOOR LIMIT SWITCHES (NOTES 4 & 5)

PAVEMENT FLOODED ALARM

ISH

PUMP STATION LIGHTS ON (NOTE 6)

SUMP PUMP CONTROL SWITCH

START

STOP

PUMP RUNNING

LOCAL START

LOCAL STOP

FAN RUNNING LIGHT

CONTROL POWER

SUMP PUMP CONTROL PANEL

SP-CP1 (PARTIAL)

HOA

PUMP RUNNING

SUMP PUMP FAULT

DRYWELL FLOODING ALARM

DEERPATH ROAD PAVEMENT FLOODED FLOAT SWITCH

ELEVATION 655.90

SUMP PUMP FLOAT SWITCHES (NOTE 4)

LSHH-005 ELEVATION 640.5

LSH-005 ELEVATION 639.5

LSL-005 ELEVATION 638.5

IC23

FILE NAME = L:\7355\CAD\Sheets\Building\I&C\7355-PS38-IC23.dgn

KNIGHT Engineers & Architects

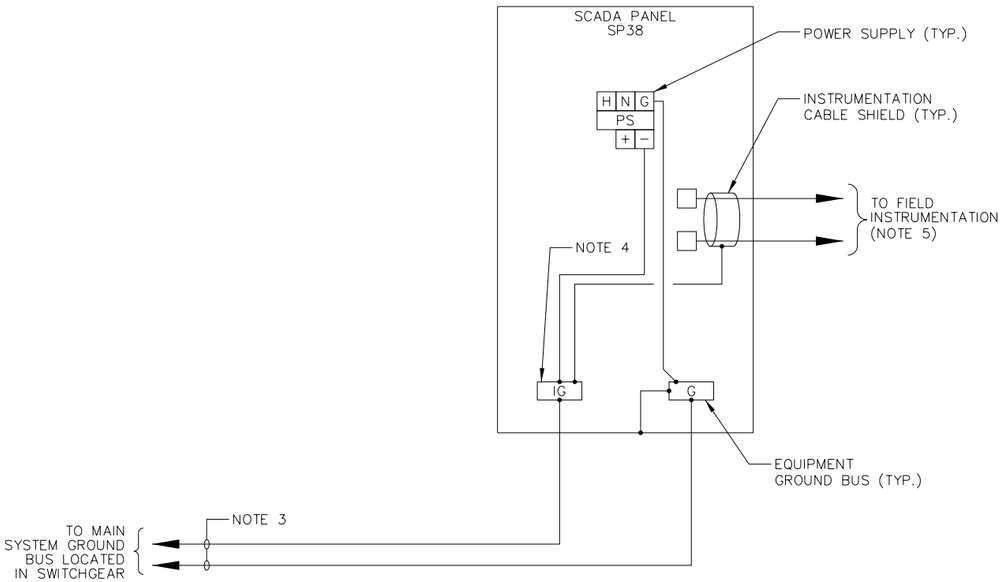
USER NAME = cliss	DESIGNED PNS	REVISED -
	DRAWN RAM	REVISED -
PLOT SCALE = 1:0.166661	CHECKED JWM	REVISED -
PLOT DATE = 6/25/2020	DATE 06/26/20	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

I & C POWER TRANSFER P&ID DRAWING
PUMP STATION 38

SCALE: | SHEET OF 22 SHEETS | STA. | TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	288
		CONTRACT NO. 62B65		
	ILLINOIS	FED. AID PROJECT		

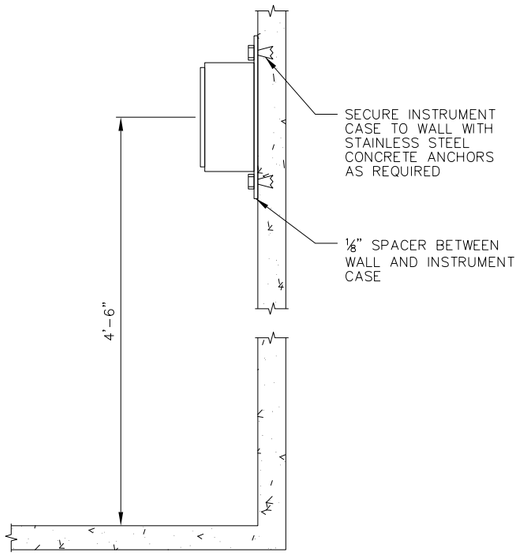


1 CONTROL AND SCADA PANEL GROUNDING DETAIL

SCALE: NONE

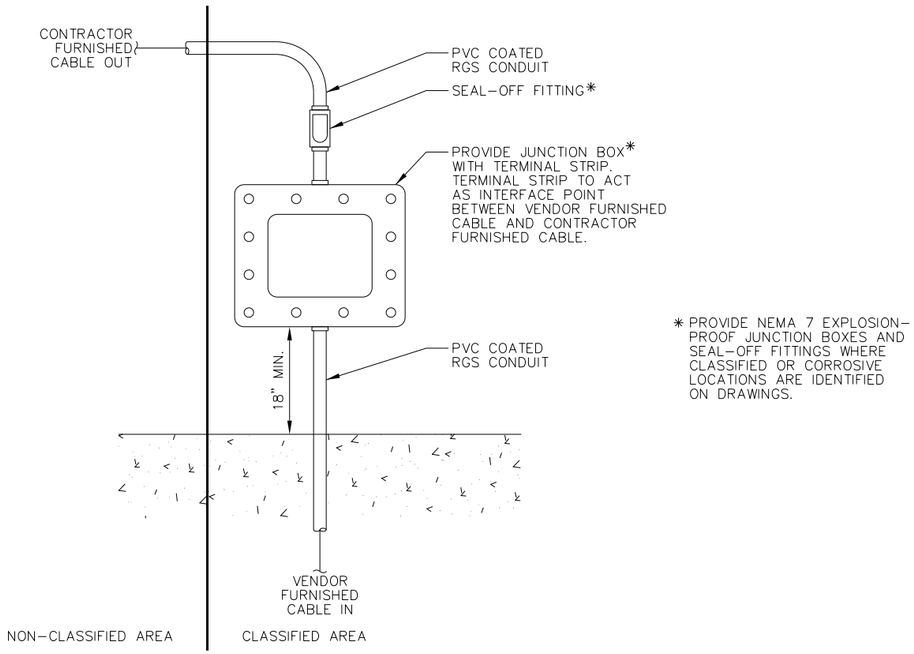
NOTES:

1. SEE SHEETS IC1 AND IC2 FOR INSTRUMENTATION SYMBOL LIST, ABBREVIATIONS, AND GENERAL NOTES.
2. NAMEPLATES TO BE WHITE WITH BLACK LETTERING.
3. PROVIDE A #4 AWG MINIMUM GROUND WIRE. GROUND WIRE MUST BE INSULATED TO ENSURE SINGLE POINT GROUND. IG GROUND WIRE TO BE GREEN W YELLOW LINE FOR IDENTIFICATION PURPOSES.
4. IG GROUND BUS MUST BE ISOLATED FROM CONTROL PANEL.
5. CABLE SHIELD MUST NOT BE CONNECTED AT FIELD DEVICE. TERMINATE SHIELD ONLY ON INSTRUMENTATION GROUND BAR AS INDICATED.



2 INSTRUMENTATION CASE MOUNTING DETAIL

SCALE: NONE



* PROVIDE NEMA 7 EXPLOSION-PROOF JUNCTION BOXES AND SEAL-OFF FITTINGS WHERE CLASSIFIED OR CORROSIVE LOCATIONS ARE IDENTIFIED ON DRAWINGS.

3 I & C JUNCTION BOX INSTALLATION DETAIL

SCALE: NONE

IC24

FILE NAME = L:\7355\CAD\Sheets\Building\I&C\7355-PS38-IC24.dgn

KNIGHT
Engineers & Architects

USER NAME = cliss	DESIGNED PNS	REVISED -
	DRAWN RAM	REVISED -
PLOT SCALE = 1:0.166661	CHECKED JWM	REVISED -
PLOT DATE = 6/25/2020	DATE 06/26/20	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

I & C MISCELLANEOUS DETAILS
PUMP STATION 38

SCALE: | SHEET OF 23 SHEETS | STA. | TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	289
		CONTRACT NO. 62B65		
	ILLINOIS FED. AID PROJECT			

NOTES:

1. UNLESS NOTED OTHERWISE, ALL CONDUITS INSTALLED INDOORS SHALL BE RIGID GALVANIZED STEEL IN THE ELECTRICAL ROOM. CONDUITS SHALL BE PVC COATED IN HAZARDOUS SPACES.

NUMBER	CONDUIT SIZE (IN.) (NOTE 1)	CONDUCTOR QUANTITY & SIZE	CONDUCTOR/CABLE INSULATION	FROM	TO
I1	3/4	2-CAT 6 ETHERNET CABLE		SCADA PANEL SP38	MCC-P38 ETHERNET SWITCH
I2	1 1/4	32 #12, 1 #12 GND.	THWN	SCADA PANEL SP38	MP-1 STARTER (MCC-P38, CUBICLE 3A)
	3/4	1-(2) CONDUCTOR 16 AWG SHIELDED TWISTED PAIR CABLE	PVC		
I3	3/4	4 #12, 1 #12 GND.	THWN	SCADA PANEL SP38	EF-1 STARTER (MCC-P38, CUBICLE 3B)
	3/4	1-(2) CONDUCTOR 16 AWG SHIELDED TWISTED PAIR CABLE	PVC		
I4	1 1/4	32 #12, 1 #12 GND.	THWN	SCADA PANEL SP38	MP-2 STARTER (MCC-P38, CUBICLE 4A)
	3/4	1-(2) CONDUCTOR 16 AWG SHIELDED TWISTED PAIR CABLE	PVC		
I5	3/4	4 #12, 1 #12 GND.	THWN	SCADA PANEL SP38	EF-2 STARTER (MCC-P38, CUBICLE 4B)
	3/4	1-(2) CONDUCTOR 16 AWG SHIELDED TWISTED PAIR CABLE	PVC		
I6	1 1/4	32 #12, 1 #12 GND.	THWN	SCADA PANEL SP38	MP-3 STARTER (MCC-P38, CUBICLE 5A)
	3/4	1-(2) CONDUCTOR 16 AWG SHIELDED TWISTED PAIR CABLE	PVC		
I7	3/4	10 #12, 1 #12 GND.	THWN	SCADA PANEL SP38	SF-1 STARTER (MCC-P38, CUBICLE 5B)
	3/4	1-(2) CONDUCTOR 16 AWG SHIELDED TWISTED PAIR CABLE	PVC		
I8	3/4	10 #12, 1 #12 GND.	THWN	SCADA PANEL SP38	SF-3 STARTER (MCC-P38, CUBICLE 5C)
	3/4	1-(2) CONDUCTOR 16 AWG SHIELDED TWISTED PAIR CABLE	PVC		
I9	1 1/4	32 #12, 1 #12 GND.	THWN	SCADA PANEL SP38	LFP STARTER (MCC-P38, CUBICLE 6A)
	3/4	1-(2) CONDUCTOR 16 AWG SHIELDED TWISTED PAIR CABLE	PVC		
I10	3/4	10 #12, 1 #12 GND.	THWN	SCADA PANEL SP38	SF-2 STARTER (MCC-P38, CUBICLE 6B)
	3/4	1-(2) CONDUCTOR 16 AWG SHIELDED TWISTED PAIR CABLE	PVC		
I11	3/4	8 #12, 1 #12 GND.	THWN	SCADA PANEL SP38	CP-SP1
I12	3/4	10 #12, 1 #12 GND.	THWN	SCADA PANEL SP38	EF-4 CONTROL PANEL
	3/4	1-(2) CONDUCTOR 16 AWG SHIELDED TWISTED PAIR CABLE	PVC		
I13	3/4	1-(2) CONDUCTOR 16 AWG SHIELDED TWISTED PAIR CABLE	PVC	SCADA PANEL SP38	THERMOSTAT DRY WELL TT-402A
I14	3/4	1-(2) CONDUCTOR 16 AWG SHIELDED TWISTED PAIR CABLE	PVC	SCADA PANEL SP38	THERMOSTAT EL. RM TT-402B
I15	3/4	1-(2) CONDUCTOR 16 AWG SHIELDED TWISTED PAIR CABLE	PVC	SCADA PANEL SP38	THERMOSTAT WET WELL INTERMED TT-402C
I16	3/4	1-(2) CONDUCTOR 16 AWG SHIELDED TWISTED PAIR CABLE	PVC	SCADA PANEL SP38	THERMOSTAT WET WELL GRD LEVEL TT-402D
I17	3/4	1-(2) CONDUCTOR 16 AWG SHIELDED TWISTED PAIR CABLE	PVC	SCADA PANEL SP38	LIT 007A
I18	3/4	1-(2) CONDUCTOR 16 AWG SHIELDED TWISTED PAIR CABLE	PVC	SCADA PANEL SP38	LIT 007B
I19	3/4	1-(2) CONDUCTOR 16 AWG SHIELDED TWISTED PAIR CABLE	PVC	SCADA PANEL SP38	LIT 009
I20	3/4	1-(2) CONDUCTOR 16 AWG SHIELDED TWISTED PAIR CABLE	PVC	SCADA PANEL SP38	LIT 011
I21	3/4	6 #12, 1 #12 GND.	THWN	SCADA PANEL SP38	GM1
I22	-	MANUFACTURER SUPPLIED		SCADA PANEL SP38	LS LEVEL SWITCHES
I23	3/4	1-(2) CONDUCTOR 16 AWG SHIELDED TWISTED PAIR CABLE	PVC	SCADA PANEL SP38	LIT 010
I24	-	MANUFACTURER SUPPLIED		LE 007A	LIT 007A
I25	-	MANUFACTURER SUPPLIED		LE 007B	LT 007B
I26	-	MANUFACTURER SUPPLIED		LE 009	LIT 009
I27	-	MANUFACTURER SUPPLIED		LE 011	LIT 011
I28	2	2-CAT 5E ETHERNET CABLE		SCADA PANEL SP38	GENERATOR CTRL. BOX
I29	3/4	1-(2) CONDUCTOR 16 AWG SHIELDED TWISTED PAIR CABLE	PVC	SCADA PANEL SP38	CRT SWITCH DRY WELL LTG
I30	3/4	1-(2) CONDUCTOR 16 AWG SHIELDED TWISTED PAIR CABLE	PVC	SCADA PANEL SP38	CRT SWITCH WET WELL LTG
I31	3/4	1-(2) CONDUCTOR 16 AWG SHIELDED TWISTED PAIR CABLE	PVC	SCADA PANEL SP38	CRT SWITCH EL ROOM LTG
I32	-	MANUFACTURER SUPPLIED		LE010	LIT 010

IC25

FILE NAME = L:\7355\CAD\Sheets\Building\I&C\7355-PS38-IC25.dgn

KNIGHT
Engineers & Architects

USER NAME = cliss	DESIGNED PNS	REVISED -
	DRAWN RAM	REVISED -
PLOT SCALE = 1:0.166661	CHECKED JWM	REVISED -
PLOT DATE = 6/25/2020	DATE 06/26/20	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

I & C CONDUIT AND WIRING SCHEDULE
PUMP STATION 38

SCALE: | SHEET OF 27 SHEETS | STA. | TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
346	(21&21S)-I	LAKE	290	290
		CONTRACT NO. 62B65		
	ILLINOIS FED. AID PROJECT			