



#### UTILITY CONTACTS

AT&T  
2121 East 63rd Street  
Kansas City, MO 64130  
Mark Manion : 816-214-2322  
MM256t@att.com

Lumen  
711 E 19th St  
Kansas City, MO 64108  
Jerry Woodall : 913-645-5032  
Jerry.Woodall@lumen.com

Consolidated Communications  
14859 W 95th Street  
Lenexa, KS 66215  
Clarence Griffin : 913-322-9619  
Clarence.Griffin@consolidated.com

Tmobile & AXON  
101 Holmes Road  
Kansas City, MO 64106  
Jason Cantrell : 913-488-8489  
Jason.Cantrell@sprint.com

Extenet Systems  
3030 Warrenville Road  
Lisle, IL 60532  
Koji Bjerke : 630-245-2075  
BBjerke@extenetsystems.com

Unite Private Networks  
7200 NW 86th Street Suite M,  
Kansas City, MO 64153  
Harold Kalwei : 816-500-3737  
Harold.Kalwei@upnfiber.com

Google Fiber  
908 Broadway Boulevard  
Kansas City, MO 64105  
Greg Link : 816-605-6936  
GregLink@google.com

Verizon Business  
10740 Nall Avenue Suite 400  
Overland Park, KS 66211  
Bryan Burger : 913-344-2007  
Bryan.Burger@verizon.com

Google Fiber  
2812 W. 47th Avenue  
Kansas City, KS 66103  
Lauren Marcucci  
LMarcucci@google.com

Windstream Communications  
10405 Baur Blvd Suite C  
Olivette, MO 63132  
Jeremy Smiddie : 618-383-4032  
Jeremy.Smiddie@windstream.com

Evergy  
4400 E Front Street  
Kansas City, MO 64120  
Jenny Casey : 816-347-4334  
jenny.casey@evergy.com

Zayo (AboveNet, AFS)  
1937 S Drumm Avenue  
Independence, MO 64055  
Dwight Davis : 816-254-8027  
Dwight.Davis@zayo.com

Evergy  
4400 E Front Street  
Kansas City, MO 64120  
Marcus Robinson : 816-652-1405  
Marcus.Robinson@evergy.com

Vicinity Energy (Trigen)  
115 Grand Boulevard  
Kansas City, MO 64106  
Craig McNeil : 816-889-4924  
Craig.Mcniel@veolia.com

Spectrum/Charter  
8221 W. 119th Street  
Overland Park, Kansas 66213  
Josh Cubley : 913-601-2504  
Josh.Cubley@charter.com

Kansas City, Missouri  
Water Services Department : Water  
4800 E 63rd Street,  
Kansas City, MO 64130  
Reza Zonnouz : 816-513-0309  
Reza.Zonnouz@kcmo.org

Spire Energy  
7500 E 35th Terrace  
Kansas City, MO 64129  
Richi Garcia : 816-507-0713  
Richi.Garcia@spireenergy.com

Kansas City, Missouri  
Water Services Department : Sanitary  
4800 E 63rd Street,  
Kansas City, MO 64130  
Karine Papikian : 816-513-0300  
Karine.Papikian@kcmo.org

# KANSAS CITY AREA TRANSPORTATION AUTHORITY WITH CITY OF KANSAS CITY, MISSOURI KANSAS CITY STREETCAR AUTHORITY PORT AUTHORITY OF KANSAS CITY, MO



## KANSAS CITY STREETCAR RIVERFRONT EXTENSION

FTA FAIN # MO-2022-002-00

KCATA PROJECT No.: 2021-SC-3P01

KCMO PROJECT No.: 89022015

ISSUED FOR BID

DECEMBER 2022

(T49N, R33W)

APPROVED BY

KCATA PROJECT MANAGER

KCATA CHIEF ENGINEER

KCMO DIRECTOR OF TRANSPORTATION

KCMO CITY ENGINEER

KCMO DIRECTOR OF PUBLIC WORKS

KANSAS CITY STREETCAR AUTHORITY

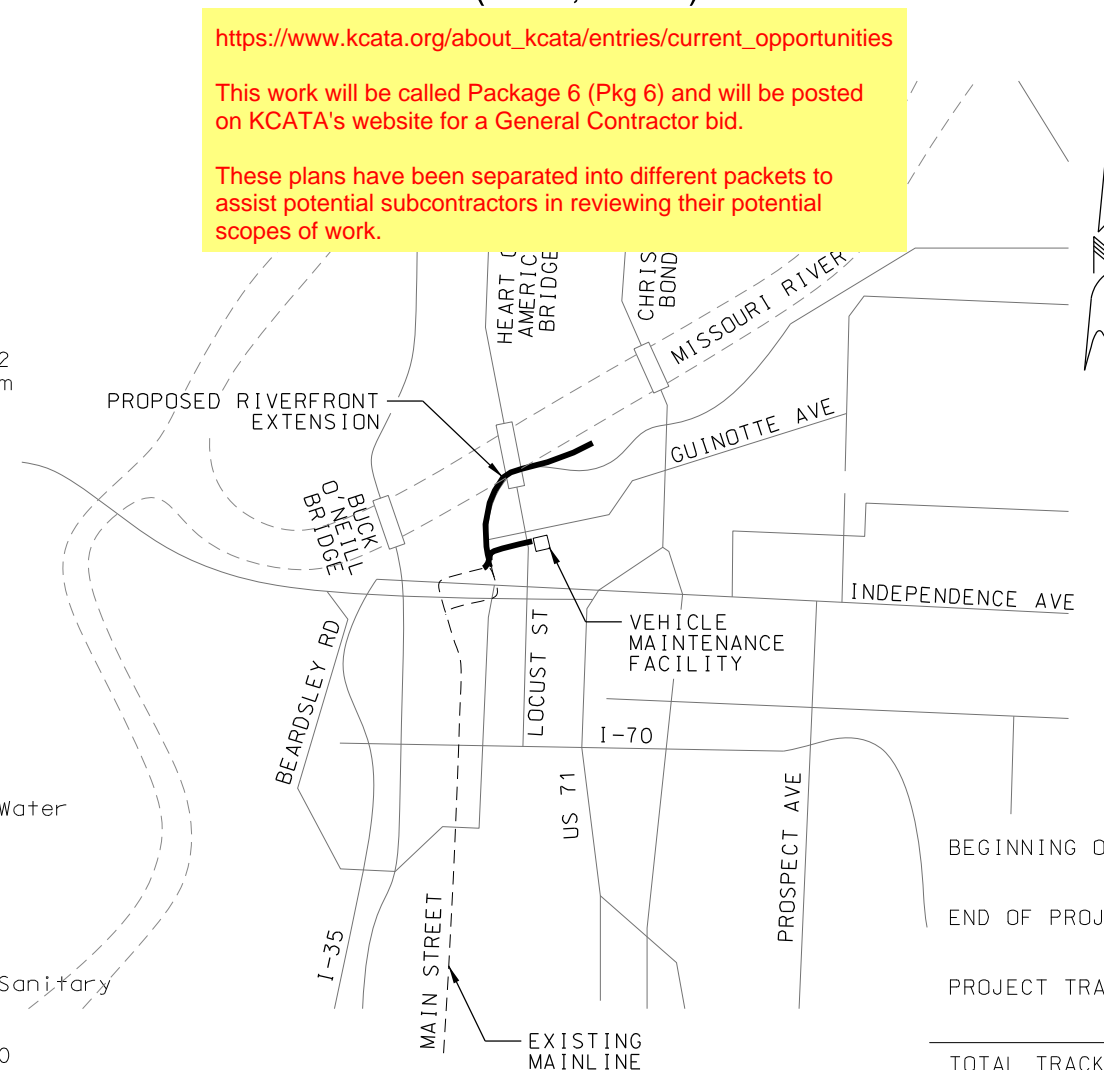
PORT AUTHORITY OF KANSAS CITY, MISSOURI  
(PORT KC)

ENTRY NO.

C.D. NO. 4

#### LENGTH OF PROJECT

BEGINNING OF PROJECT	STA 113+00.00 NB MAINLINE
	STA 199+89.24 SB MAINLINE
END OF PROJECT	STA 150+82.51 NB MAINLINE
	STA 236+48.29 SB MAINLINE
PROJECT TRACK LENGTH	3,783 TF NB
	3,659 TF SB
TOTAL TRACK LENGTH	7,442 TF (1.4 MILES)



This set of plans is  
not for  
construction.  
These plans are  
intended to build  
interest in bidding  
the project.



10450 Holmes Road  
Suite 600  
Kansas City, MO 64131-3471  
816-360-2700  
Certificate of Authority: 000856

SCALE FOR 22"x34": NOT TO SCALE	
FILENAME: G001.dgn	
CONTRACT NO.:	
CONTRACT NO.:	
VOLUME:	
DRAWING NO.:	SHEET NO.:
G001	1


#	dwg	TITLE	DESCRIPTION	#	dwg	TITLE	DESCRIPTION
GENERAL SHEETS							
1	G001	TITLE SHEET AND LOCATION MAP		60	K304A	SOUTHBOUND 115RE TRACK PROFILE	SB STA 211+00 TO STA 215+00
2	G010	INDEX OF DRAWINGS	SHEET 1	61	K305	NORTHBOUND 115RE TRACK PLAN AND PROFILE	NB STA 125+00 TO STA 129+00
3	G011	INDEX OF DRAWINGS	SHEET 2	62	K305A	SOUTHBOUND 115RE TRACK PROFILE	SB STA 215+00 TO STA 219+00
4	G012	INDEX OF DRAWINGS	SHEET 3	63	K306	NORTHBOUND 115RE TRACK PLAN AND PROFILE	NB STA 129+00 TO STA 133+00
5	G013	INDEX OF DRAWINGS	SHEET 4	64	K306A	SOUTHBOUND 115RE TRACK PROFILE	SB STA 219+00 TO STA 223+00
6	G030	STANDARD ABBREVIATIONS	SHEET 1 OF 2	TRACK DETAILS			
7	G031	STANDARD ABBREVIATIONS	SHEET 2 OF 2	65	K901	TRACK SLAB DETAILS	DETAIL SHEET 1 OF 5
8	G032	DCS GENERAL SYMBOLS AND ABBREVIATIONS		66	K902	TRACK SLAB DETAILS	DETAIL SHEET 2 OF 5
9	G035	STANDARD SYMBOLS		67	K903	TRACK SLAB DETAILS	DETAIL SHEET 3 OF 5
10	G036	TRACTION POWER SYMBOLS		68	K904	TRACK SLAB DETAILS	DETAIL SHEET 4 OF 5
11	G037	TRACTION POWER ABBREVIATIONS		69	K905	TRACK SLAB DETAILS	DETAIL SHEET 5 OF 5
12	G038	SYSTEMWIDE ELECTRICAL ABBREVIATIONS AND SYMBOLS		70	K906	115 RE AND 112 TRAM RAIL SECTIONS	
13	G040	GENERAL NOTES		71	K907	TRANSITION RAIL	
14	G041	DCS GENERAL NOTES		72	K908	25M/25M EQUILATERAL CONTINUOUSLY CURVED FROG TURNOUT	
15	G042	DCS STRUCTURAL STEEL AND CONCRET NOTES		73	K909	25M CONTINUOUSLY CURVED FROG TURNOUT	
16	G043	TRACTION POWER GENERAL NOTES		74	K910	25M CONTINUOUSLY CURVED FROG TURNOUT	
SURVEY CONTROL				75	K911	25M STRAIGHT FROG TURNOUT	
17	SV001	SURVEY CONTROL	SHEET 1 OF 2	76	K912	TURNOUT ENCAPSULATION AND SECTION DETAILS	
18	SV002	SURVEY CONTROL	SHEET 2 OF 2	77	K913	MANHOLE REBAR DETAIL	DETAIL SHEET 1 OF 2
DEMOLITION PLANS				78	K914	MANHOLE REBAR DETAIL	DETAIL SHEET 2 OF 2
19	C501	DEMOLITION PLAN	NB STA BEGIN TO STA 113+00	79	K915	TRACK DRAIN DETAILS	
20	C502	DEMOLITION PLAN	NB STA 113+00 TO STA 117+92	80	K916	HORIZONTAL PRECURVED RAIL LOCATION MAP	
21	C503	DEMOLITION PLAN	NB STA 117+92 TO STA 121+00	81	K917	HORIZONTAL PRECURVED RAIL DETAILS	
22	C504	DEMOLITION PLAN	NB STA 121+00 TO STA 125+00	82	K918	RESTRAINING RAIL	
23	C505	DEMOLITION PLAN	NB STA 125+00 TO STA 129+00	83	K919	INSULATED JOINT 115 RE RAIL	
24	C506	DEMOLITION PLAN	NB STA 129+00 TO STA 133+00	84	K920	TRACK SLAB JOINTS	
25	C507	DEMOLITION PLAN	NB STA 133+00 TO STA 135+50	85	K921	END OF LINE CURB STOP	
26	C508	DEMOLITION PLAN	NB STA 135+50 TO STA 139+50	86	K922	TRACK SLAB INFILL GRADING DETAIL	
27	C509	DEMOLITION PLAN	NB STA 139+50 TO STA 143+50	87	K923	112 TRAM RAIL EXPANSION JOINTS	
28	C510	DEMOLITION PLAN	NB STA 143+50 TO STA 147+50	88	K923A	115 RE RAIL EXPANSION JOINTS	
29	C511	DEMOLITION PLAN	NB STA 147+50 TO END	89	K924	NO. 4 STRAIGHT FROG CROSSOVER	
30	C512	DEMOLITION PLAN	2ND STREET TO VMF	CIVIL DETAILS			
TRACK PLAN AND PROFILES				90	C001	TYPICAL SECTIONS 1	
31	K001	TRACK KEY MAP		91	C002	TYPICAL SECTIONS 2	
32	K101	NORTHBOUND TRACK PLAN AND PROFILE	NB STA BEGIN TO STA 113+50	92	C003	TYPICAL SECTIONS 3	
33	K101A	EXISTING TRACK TIE-IN PROFILE STA -1+00 TO STA 2+50	SB TRACK PROFILE STA 199+00 TO STA 203+00	93	C004	TYPICAL DRIVEWAY DETAILS	
34	K102	NORTHBOUND TRACK PLAN AND PROFILE	NB STA 113+50 TO STA 117+00	94	C005	TYPICAL CURB DETAILS	
35	K102A	VMF LEAD PROFILE STA -0+50 TO STA 3+00	SB TRACK PROFILE STA 203+00 TO STA 207+00	95	C006	MISCELLANEDUS CIVIL DETAILS	
36	K103	NORTHBOUND TRACK PLAN AND PROFILE	NB STA 117+00 TO STA 121+00	CIVIL PLANS			
37	K103A	SOUTHBOUND TRACK PROFILE	SB STA 207+00 TO STA 211+00	96	C101	CIVIL PLAN	NB STA BEGIN TO STA 113+00
38	K104	NORTHBOUND TRACK PLAN AND PROFILE	NB STA 121+00 TO STA 125+00	97	C102	CIVIL PLAN	NB STA 113+00 TO STA 117+00
39	K104A	SOUTHBOUND TRACK PROFILE	SB STA 211+00 TO STA 215+00	98	C103	CIVIL PLAN	NB STA 117+00 TO STA 121+00
40	K105	NORTHBOUND TRACK PLAN AND PROFILE	NB STA 125+00 TO STA 129+00	99	C104	CIVIL PLAN	NB STA 121+00 TO STA 125+00
41	K105A	SOUTHBOUND TRACK PROFILE	SB STA 215+00 TO STA 219+00	100	C105	CIVIL PLAN	NB STA 125+00 TO STA 129+00
42	K106	NORTHBOUND TRACK PLAN AND PROFILE	NB STA 129+00 TO STA 133+00	101	C106	CIVIL PLAN	NB STA 129+00 TO STA 133+00
43	K106A	SOUTHBOUND TRACK PROFILE	SB STA 219+00 TO STA 223+00	102	C107	CIVIL PLAN	NB STA 133+00 TO STA 135+50
44	K107	NORTHBOUND TRACK PLAN AND PROFILE	NB STA 133+00 TO STA 135+50	103	C108	CIVIL PLAN	NB STA 135+50 TO STA 139+50
45	K107A	SOUTHBOUND TRACK PROFILE	SB STA 223+00 TO STA 225+50	104	C109	CIVIL PLAN	NB STA 139+50 TO STA 143+50
46	K108	NORTHBOUND TRACK PLAN AND PROFILE	NB STA 135+50 TO STA 139+50	105	C110	CIVIL PLAN	NB STA 143+50 TO STA 147+50
47	K108A	SOUTHBOUND TRACK PROFILE	SB STA 225+50 TO STA 229+50	106	C111	CIVIL PLAN	NB STA 147+50 TO END
48	K109	NORTHBOUND TRACK PLAN AND PROFILE	NB STA 139+50 TO STA 143+50	107	C112	CIVIL PLAN	2ND STREET TO VMF
49	K109A	SOUTHBOUND TRACK PROFILE	SB STA 229+50 TO STA 233+50	STREETCAR STOP DETAILS			
50	K110	NORTHBOUND TRACK PLAN AND PROFILE	NB STA 143+50 TO STA 147+50	108	C201	STREETCAR STOP	NB "RIVER MARKET NORTH"
51	K110A	SOUTHBOUND TRACK PROFILE	SB STA 233+50 TO STA 237+50	109	C202	STREETCAR STOP	NB/SB "RIVERFRONT"
52	K111	NORTHBOUND TRACK PLAN AND PROFILE	NB STA 147+50 TO STA 150+83	ADA PLANS			
53	K112	NORTHBOUND TRACK PLAN AND PROFILE	2ND STREET TO VMF	110	C301	ADA CURB RAMPS LAYOUT PLAN	RAMP NOTES AND DETAILS
54	K113	NORTHBOUND TRACK PLAN AND PROFILE	2ND STREET TO VMF	111	C302	ADA CURB RAMP STANDARD DETAILS	SHEET 1 OF 2
TRACK ALIGNMENT TABLES				112	C303	ADA RAMP STANDARD DETAILS	SHEET 2 OF 2
55	K200	TRACK ALIGNMENT TABULATION		113	C304	3RD STREET AND GRAND BOULEVARD	GRADING PLAN
56	K201	TRACK ALIGNMENT TABULATION		114	C305	2ND STREET AND GRAND BOULEVARD	GRADING PLAN
TRACK PLANS 115RE				115	C306	GRADING LAYOUT PLANS	2ND STREET TO VMF
57	K303	NORTHBOUND 115RE TRACK PLAN AND PROFILE	NB STA 117+00 TO STA 121+00	116	C307	GRADING LAYOUT PLANS	
58	K303A	SOUTHBOUND 115RE TRACK PROFILE	SB STA 207+00 TO STA 211+00	117	C308	GRADING LAYOUT PLANS	
59	K304	NORTHBOUND 115RE TRACK PLAN AND PROFILE	NB STA 121+00 TO STA 125+00	118	C309	GRADING LAYOUT PLANS	
				119	C310	GRADING LAYOUT PLANS	

REV	DATE	DESCRIPTION	DESIGNED BY	MMO		 <p>This set of plans is not for construction. These plans are intended to build interest in bidding the project.</p>	ISSUED FOR BID	DATE: 12-23-2022	KANSAS CITY STREETCAR - RIVERFRONT EXTENSION	INDEX OF DRAWINGS SHEET 1	SCALE FOR 22"x34": NOT TO SCALE	
			CHECKED BY	JWR			 <p>HDR Engineering, Inc. 10450 Holmes Road Suite 600 Kansas City, MO 64131-3471 816-360-2700 Certificate of Authority: 000856</p>	NOT FOR CONSTRUCTION			FILENAME:	G010.dgn
			DRAWN BY	MMO							CONTRACT NO.:	CONTRACT NO. ***
			CHECKED BY	JWR							VOLUME:	1
			APPROVED BY	NKS							DRAWING NO.:	SHEET NO.:
PLOT DATE: \$DATE\$			\$TIME\$		DATE	12-23-2022			G010	2		

#	dwg	TITLE	DESCRIPTION	#	dwg	TITLE	DESCRIPTION
120	C311	GRADING LAYOUT PLANS		181	P310	"TYPE B" SHELTER	PLANS AND ELEVATIONS
121	C312	GRADING LAYOUT PLANS		182	P311	"TYPE B" SHELTER	SHELTER ROOF PLAN AND RCP
122	C313	GRADING LAYOUT PLANS		183	P312	"TYPE B" SHELTER	SHELTER ENLARGED PLANS
123	C314	GRADING LAYOUT PLANS		184	P313	"TYPE B" SHELTER	ENLARGED ELEVATION AND SECTION
124	C315	POINT TABLES		185	P361	SHELTER DETAILS	
125	C316	POINT TABLES		186	P362	SHELTER DETAILS	
TPSS PLANS				187	P363	"TYPE B" SHELTER DETAILS	ADD ALTERNATE
126	C401	TRACTION POWER SUBSTATION (TPSS)	RIVERFRONT GRADING PLAN	188	P371	MARKER SECTION AND DETAILS	
127	C402	TRACTION POWER SUBSTATION (TPSS)	RIVERFRONT DUCTBANK PLAN	189	P372	MARKER SECTION AND DETAILS	
128	C403	TRACTION POWER SUBSTATION (TPSS)	RIVERFRONT DUCTBANK PRDFILE 1	190	P380	ELECTRICAL LIGHTING PLANS AND FIXTURE SCHEDULE	
129	C404	TRACTION POWER AND SCADA SYSTEM	TYPICAL DUCTBANK SECTIONS	191	P401	PLATFORM ITS AND ELECTRICAL GENERAL NOTES	
130	C405	TRACTION POWER SUBSTATION (TPSS)	DUCTBANK SPECIAL DETAILS	192	P402	PLATFORM ROADSIDE ITS 343 CABINET DIAGRAM	
131	C406	TRACTION POWER SUBSTATION (TPSS)	TYPICAL LOW VOLTAGE 5'x7' MANHOLE DETAILS	193	P403	CCTV ATTACHMENT ON OCS AND LIGHT POLE DETAILS	
132	C407	TRACTION POWER SUBSTATION (TPSS)	COMMUNICATIONS AND STRAY CURRENT PULLBOX TYPICAL DETAILS	194	P404	STREETCAR STOP "RIVER MARKET NORTH"	ELECTRICAL AND ITS PLAN
133	C408	TRACTION POWER SUBSTATION (TPSS)	TYPICAL NEGATIVE RETURN DETAIL TRACK BLOCKOUT DETAIL AND TYPICAL CONDUIT STUB-UP DETAIL	195	P405	STREETCAR STOP "RIVERFRONT"	ELECTRICAL AND ITS PLAN
134	C409	TRACTION POWER SUBSTATION (TPSS)	TYPICAL NEGATIVE RETURN DETAIL TRACK BLOCKOUT DETAIL AND TYPICAL CONDUIT STUB-UP DETAIL	196	P406	ITS TYPICAL DRAWING	TYPICAL STOP ELECTRICAL SCHEDULES AND DETAILS
TPSS DETAILS				PLATFORM STRUCTURAL			
135	J101	TRACTION POWER SYSTEM	MASTER SINGLE LINE DIAGRAM RIVERFRONT EXTENSION	197	PS001	STRUCTURAL GENERAL NOTES	
136	J610	TRACTION POWER	TYPICAL MAINLINE TPSS SINGLE LINE SINGLE LINE DIAGRAM	198	PS002	INSPECTION - IBC 2018	
137	J620	TRACTION POWER	TYPICAL PREFABRICATED TPSS PLAN EQUIPMENT LAYOUT PLAN	199	PS101	"TYPE A" SHELTER - FOUNDATION AND FRAMING PLANS	
138	J621	TRACTION POWER	TYPICAL PREFABRICATED TPSS - EXTERIOR ELEVATIONS ELEVATION VIEW	200	PS102	"TYPE B" SHELTER - FOUNDATION AND FRAMING PLANS	
139	J622	TRACTION POWER	TYPICAL PREFABRICATED TPSS INTERIOR ELEVATIONS INTERIOR ELEVATIONS	201	PS201	"TYPE A" SHELTER - SECTIONS AND ELEVATIONS	
140	J623	TRACTION POWER	TYPICAL SURGER ARRESTER INTERIOR ELEVATIONS	202	PS202	"TYPE B" SHELTER - SECTIONS AND ELEVATIONS	
141	J630	TRACTION POWER	TPSS D1 SITE RACEWAY LAYOUT	203	PS301	TYPICAL CONCRETE DETAILS	
142	J632	TRACTION POWER	TPSS D1 GROUND GRID LAYOUT	204	PS302	"TYPE A" SHELTER CONCRETE DETAILS	
143	J640	TRACTION POWER	TYPICAL DISCONNECT SWITCH ARRANGEMENT	205	PS303	"TYPE B" SHELTER CONCRETE DETAILS	
144	J642	TRACTION POWER	120/208V AC PANEL ADP PANEL SCHEDULE	206	PS501	TYPICAL STEEL SECTIONS AND DETAILS	
145	J643	TRACTION POWER	125V DC PANEL DDP PANEL SCHEDULE	PLATFORM ELEVATION PLANS			
146	J644	TRACTION POWER	TYPICAL TPSS LIGHTING SCHEMATIC	207	PS01	"RIVER MARKET NORTH" PLATFORM	SIGNAGE LOCATION ELEVATION
147	J645	TRACTION POWER	TYPICAL TPSS RECEPTACLES AND SMOKE DETECTOR SCHEMATIC	208	PS02	"RIVERFRONT" PLATFORM	SIGNAGE LOCATION ELEVATION
148	J646	TRACTION POWER	TYPICAL TPSS HVAC AND VENTILATION SCHEMATIC	209	PS03	SIGNAGE TYPES OVERVIEW	
149	J648	TRACTION POWER	LOGIC DIAGRAMS SYMBOLS AND LEGEND	210	PS04	SIGNAGE TYPES OVERVIEW	
150	J649	TRACTION POWER	SUBSTATION LOCKOUT AND ALARM LOGIC DIAGRAM	211	PS05	SIGNAGE TYPES OVERVIEW	
151	J650	TRACTION POWER	AC SWITCHGEAR INCOMING CUBICLE LOGIC DIAGRAM	212	PS06	SIGNAGE TYPES OVERVIEW	
152	J652	TRACTION POWER	TYPICAL DC FEEDER CUBICLE LOGIC DIAGRAM SHEET 1 OF 2	213	PS07	"RIVER MARKET NORTH" PLATFORM	WAYFINDING PLAN
153	J653	TRACTION POWER	TYPICAL DC FEEDER CUBICLE LOGIC DIAGRAM SHEET 2 OF 2	TRAFFIC SIGNAL LAYOUT PLANS			
154	J654	TRACTION POWER	NEGATIVE AND POSITIVE DISCONNECT SWITCH LOGIC DIAGRAM	214	T100	TRAFFIC SIGNAL GENERAL NOTES	
155	J660	TRACTION POWER	STATION CONTROL CABINET TYPICAL LAYOUT	215	T101	TRAFFIC SIGNAL LAYOUT PLAN	3RD STREET AND GRAND BOULEVARD
156	J661	TRACTION POWER	RAIL TO GROUND (R2G) CABINET TYPICAL LAYOUT	216	T101A	TRAFFIC SIGNAL LAYOUT PLAN	3RD STREET AND GRAND BOULEVARD
157	J665	TRACTION POWER	TPSS COMMUNICATIONS BLOCK DIAGRAM	217	T101B	TRAFFIC SIGNAL WIRING DIAGRAM AND PHASING	3RD STREET AND GRAND BOULEVARD
158	J673	TRACTION POWER	TYPICAL GROUNDING DETAILS	218	T101C	TRAFFIC SIGNAL SUMMARY OF QUANTITIES	3RD STREET AND GRAND BOULEVARD
159	J680	TRACTION POWER	D1 CONDUCTOR SCHEDULE	219	T102	TRAFFIC SIGNAL LAYOUT PLAN	2ND STREET AND GRAND BOULEVARD
160	J690	TRACTION POWER	TYPICAL TPSS HMI ALARM SCREEN LAYOUT	220	T102A	TRAFFIC SIGNAL LAYOUT PLAN	2ND STREET AND GRAND BOULEVARD
161	J691	TRACTION POWER	TYPICAL TPSS HMI CONTROL SCREEN LAYOUT	221	T102B	TRAFFIC SIGNAL WIRING DIAGRAM AND PHASING	2ND STREET AND GRAND BOULEVARD
162	J692	TRACTION POWER	TYPICAL TPSS HMI EVENT LOG SCREEN LAYOUT	222	T102C	TRAFFIC SIGNAL SUMMARY OF QUANTITIES	2ND STREET AND GRAND BOULEVARD
163	J693	TRACTION POWER	TYPICAL TPSS HMI NETWORK STATUS SCREEN LAYOUT	223	T103	TRAFFIC SIGNAL LAYOUT PLAN	BERKLEY PARKWAY / RIVERFRONT DRIVE
164	J694	TRACTION POWER	TYPICAL SUBSTATION FOUNDATION DETAIL	224	T103B	TRAFFIC SIGNAL WIRING DIAGRAM AND PHASING	BERKLEY PARKWAY / RIVERFRONT DRIVE
165	J695	TRACTION POWER	TYPICAL PAD MOUNTED DISCONNECT SWITCH FOUNDATION DETAILS	225	T103C	TRAFFIC SIGNAL SUMMARY OF QUANTITIES	BERKLEY PARKWAY / RIVERFRONT DRIVE
DRAINAGE PLANS				TRAFFIC SIGNAL DETAILS			
166	D101	DRAINAGE PLAN	NB STA BEGIN TO STA 113+00	226	T201	TRAFFIC SIGNAL DETAILS	CROSS SPAN JOINT USE TRAFFIC/OCS POLE
167	D102	DRAINAGE PLAN	NB STA 113+00 TO STA 117+00	227	T202	TRAFFIC SIGNAL DETAILS	AUXILIARY CABINET MOUNTING DETAIL
168	D103	DRAINAGE PLAN	NB STA 117+00 TO STA 121+00	228	T203	TRAFFIC SIGNAL DETAILS	TRAFFIC SIGNAL SYMBOLS
169	D106	DRAINAGE PLAN	NB STA 129+00 TO STA 133+00	229	T204	TRAFFIC SIGNAL DETAILS	SIGNAL HEAD DETAILS
170	D109	DRAINAGE PLAN	NB STA 139+50 TO STA 143+50	230	T205	TRAFFIC SIGNAL DETAILS	SIGNAL MAST ARM DETAILS
171	D110	DRAINAGE PLAN	NB STA 143+50 TO STA 147+50	231	T206	TRAFFIC SIGNAL DETAILS	SIGNAL CONCRETE BASE DETAILS
172	D111	DRAINAGE PLAN	NB STA 147+50 TO END	232	T207	TRAFFIC SIGNAL DETAILS	SIGNAL PULL BOX DETAILS
173	D301	MISCELLANEOUS DRAINAGE DETAILS		233	T208	TRAFFIC SIGNAL DETAILS	SIGNAL PULL BOX DETAILS
PLATFORMS				234	T209	TRAFFIC SIGNAL DETAILS	SIGNAL PTZ CAMERA INSTALL DETAILS
174	P101	"RIVER MARKET NORTH"	PLATFORM PLAN	235	T210	TRAFFIC SIGNAL DETAILS	PEDESTRIAN PUSHBUTTON POLE DETAILS
175	P102	"RIVERFRONT"	PLATFORM PLAN	236	T211	TRAFFIC SIGNAL DETAILS	PEDESTRIAN PUSHBUTTON POLE DETAILS
176	P201	"RIVER MARKET NORTH"	PLATFORM ELEVATION	SIGNING AND STRIPING PLANS			
177	P202	"RIVERFRONT"	PLATFORM ELEVATION	237	S001	SIGNING AND STRIPING	GENERAL NOTES
178	P203	PLATFORM SITE DETAILS		238	S100	SIGNING AND STRIPING PLAN	5TH TO 3RD STREET
179	P204	PLATFORM SEAT WALL DETAILS		239	S101	SIGNING AND STRIPING PLAN	NB STA BEGIN TO STA 113+00
180	P302	"TYPE A" SHELTER	PLANS AND ELEVATIONS	240	S102	SIGNING AND STRIPING PLAN	NB STA 113+00 TO STA 117+00
				241	S103	SIGNING AND STRIPING PLAN	NB STA 117+00 TO STA 121+00


REV	DATE	DESCRIPTION	DESIGNED BY	MMO		 <p>This set of plans is not for construction. These plans are intended to build interest in bidding the project.</p>	ISSUED FOR BID	DATE: 12-23-2022	<b>KANSAS CITY STREETCAR - RIVERFRONT EXTENSION</b>	SCALE FOR 22"x34": NOT TO SCALE	
			CHECKED BY	JWR			 <div>HDR Engineering, Inc. 10450 Holmes Road Suite 600 Kansas City, MO 64131-3471 816-360-2700 Certificate of Authority: 000856</div>	INDEX OF DRAWINGS SHEET 2		FILENAME: G011.dgn	
			DRAWN BY	MMO						CONTRACT NO.: CONTRACT NO. ***	
			CHECKED BY	JWR						VOLUME: I	
			APPROVED BY	NKS						DRAWING NO.: G011	SHEET NO.: 3
PLOT DATE: \$DATE\$				\$TIME\$	DATE	12-23-2022	NOT FOR CONSTRUCTION				

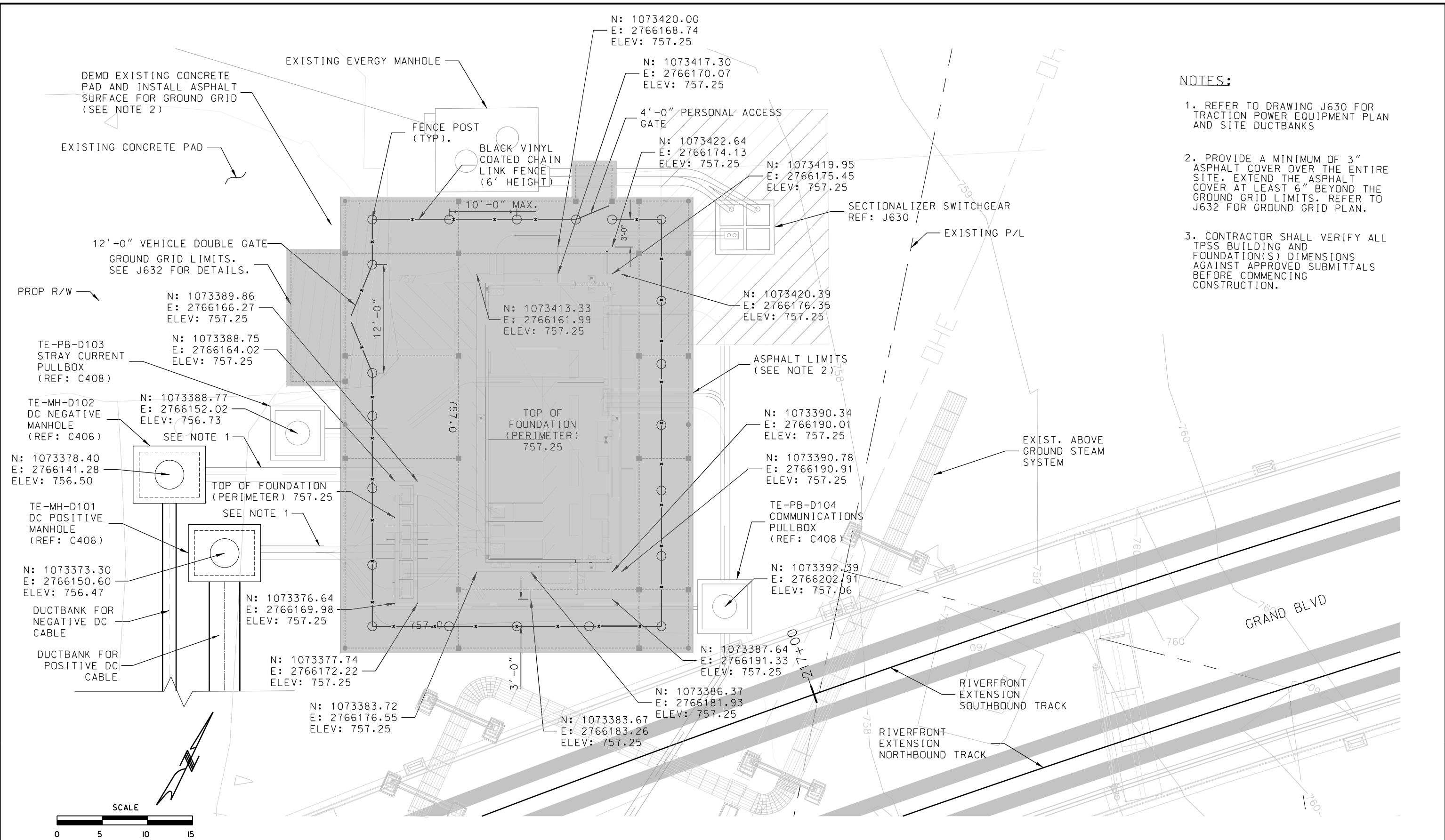
#	dwg	TITLE	DESCRIPTION	#	dwg	TITLE	DESCRIPTION
242	S104	SIGNING AND STRIPING PLAN	NB STA 121+00 TO STA 125+00	302	ST308	BID ALTERNATE - 115RE JOINTS FINGER JOINT MODIFICATION PLAN - PIER 8	
243	S105	SIGNING AND STRIPING PLAN	NB STA 125+00 TO STA 129+00	303	ST309	BID ALTERNATE - 115RE JOINTS FINGER JOINT MODIFICATION DETAILS	
244	S106	SIGNING AND STRIPING PLAN	NB STA 129+00 TO STA 133+00	304	ST310	BID ALTERNATE - 115RE JOINTS STRIP SEAL REMOVAL AND REPLACEMENT PLAN - PIERS 11 & 12	
245	S107	SIGNING AND STRIPING PLAN	NB STA 133+00 TO STA 135+50	305	ST311	BID ALTERNATE - 115RE JOINTS STRIP SEAL DETAILS	
246	S108	SIGNING AND STRIPING PLAN	NB STA 135+50 TO STA 139+50	306	ST312	BID ALTERNATE - 115RE JOINTS TYPICAL SLAB SECTIONS AND DETAILS	
247	S109	SIGNING AND STRIPING PLAN	NB STA 139+50 TO STA 143+50	307	ST313	BID ALTERNATE - 115RE JOINTS SLAB REINFORCING - PIER 2	
248	S110	SIGNING AND STRIPING PLAN	NB STA 143+50 TO STA 147+50	308	ST314	BID ALTERNATE - 115RE JOINTS SLAB REINFORCING - PIER 5	
249	S111	SIGNING AND STRIPING PLAN	NB STA 147+50 TO END	309	ST315	BID ALTERNATE - 115RE JOINTS SLAB REINFORCING - PIER 8	
250	S112	SIGNING AND STRIPING PLAN	2ND STREET TO VMF	310	ST316	BID ALTERNATE - 115RE JOINTS SLAB REINFORCING - PIER 11	
251	S113	PAVEMENT MARKING TABULATION		311	ST317	BID ALTERNATE - 115RE JOINTS SLAB REINFORCING - PIER 12	
252	S114	SIGN REMOVAL TABULATION		312	ST318	BID ALTERNATE - 115RE JOINTS BILL OF REINFORCING STEEL (SLAB)	
253	S115	SIGN PANEL DETAILS		313	ST319	BID ALTERNATE - 115RE JOINTS BILL OF REINFORCING STEEL (SLAB)	
LIGHTING PLANS				314	ST320	BID ALTERNATE - 115RE JOINTS BILL OF REINFORCING STEEL (SLAB)	
254	L001	GENERAL LIGHTING NOTES AND SYMBOL LEGEND		315	ST321	BID ALTERNATE - 115RE JOINTS EAST BARRIER RAIL AT PIER 2, 5 & 8	
255	L101	LIGHTING PLAN	NB STA BEGIN TO STA 113+00	316	ST322	BID ALTERNATE - 115RE JOINTS EAST BARRIER RAIL AT PIER 11 & 12	
256	L102	LIGHTING PLAN	NB STA 113+00 TO STA 117+00	317	ST323	BID ALTERNATE - 115RE JOINTS EAST BARRIER DETAILS	
257	L103	LIGHTING PLAN	NB STA 117+00 TO STA 121+00	318	ST324	BID ALTERNATE - 115RE JOINTS WEST BARRIER RAIL AT PIER 2, 5 & 8	
258	L104	LIGHTING PLAN	NB STA 121+00 TO STA 125+00	319	ST325	BID ALTERNATE - 115RE JOINTS WEST BARRIER RAIL AT PIER 11 & 12	
259	L105	LIGHTING PLAN	NB STA 125+00 TO STA 129+00	320	ST326	BID ALTERNATE - 115RE JOINTS WEST BARRIER DETAILS	
260	L106	LIGHTING PLAN	NB STA 129+00 TO STA 133+00	321	ST328	BID ALTERNATE - 115RE JOINTS BARRIER DETAILS 1	
261	L107	LIGHTING PLAN	NB STA 133+00 TO STA 135+50	322	ST329	BID ALTERNATE - 115RE JOINTS BARRIER DETAILS 2	
262	L108	LIGHTING PLAN	NB STA 135+50 TO STA 139+50	323	ST330	BID ALTERNATE - 115RE JOINTS BARRIER DETAILS 3	
263	L109	LIGHTING PLAN	NB STA 139+50 TO STA 143+50	324	ST331	BID ALTERNATE - 115RE JOINTS EAST BARRIER BAR LIST	
264	L110	LIGHTING PLAN	NB STA 143+50 TO STA 147+50	325	ST332	BID ALTERNATE - 115RE JOINTS WEST BARRIER BAR LIST	
265	L111	LIGHTING PLAN	NB STA 147+50 TO END	EROSION CONTROL PLANS			
266	L112	LIGHTING PLAN	2ND STREET TO VMF	326	EC101	EROSION CONTROL PLAN	NB STA 135+50 TO STA 139+50
LIGHTING DETAILS				327	EC102	EROSION CONTROL PLAN	NB STA 139+50 TO STA 143+50
267	L300	STREET LIGHTING DETAILS		328	EC103	EROSION CONTROL PLAN	NB STA 143+50 TO STA 147+50
268	L301	STREET LIGHTING DETAILS		329	EC104	EROSION CONTROL PLAN	NB STA 147+50 TO END
269	L302	POWER AND LIGHTING DETAILS		OCS TECHNICAL SHEETS			
270	L303	POWER AND LIGHTING DETAILS		330	Y004	TECHNICAL SHEETS CONDUCTOR PARTICULARS	
271	L304	STREET LIGHTING SCHEDULES		331	Y005	TECHNICAL SHEETS VERTICAL ELECTRICAL CLEARANCE REQUIREMENTS	
272	L305	STREET LIGHTING SCHEDULES		332	Y006	TECHNICAL SHEETS PANTOGRAPH SECURITY	
273	L306	WIRING SCHEMATIC DETAILS		333	Y007	TECHNICAL SHEETS TYPICAL OFFSET AND STAGGER DETAILS	
274	L307	WIRING SCHEMATIC DETAILS		334	Y008	TECHNICAL SHEETS INSTALLATION TENSION CHART	
LANDSCAPE PLANS				335	Y009	TECHNICAL SHEETS ALONG TRACK MOVEMENT CHART	
275	LS101	LANDSCAPE PLAN	BERKLEY PARK - 1	336	Y010	TECHNICAL SHEETS VERTICAL AND RADIAL LOADS	
276	LS102	LANDSCAPE PLAN	BERKLEY PARK - 2	337	Y011	TYPICAL ARRANGEMENTS TYPICAL OVERLAP ARRANGEMENT	
277	LS103	LANDSCAPE PLAN	BERKLEY PARK - 3	338	Y012	TYPICAL ARRANGEMENTS AT GRAND BOULEVARD VIADUCT	
278	LS104	LANDSCAPE PLAN	GRAND BOULEVARD	339	Y013	TYPICAL ARRANGEMENTS AT APPROACH STRUCTURES	
279	LS201	LANDSCAPE DETAILS		340	Y021	STRUCTURAL DETAILS TYPICAL POLE DETAIL	
BRIDGE DETAILS 112TRAM				341	Y023	STRUCTURAL DETAILS STREETLIGHT POLE DETAIL	
280	ST100	BASE BID - 112TRAM JOINTS GENERAL NOTES		342	Y025	STRUCTURAL DETAILS DOWN GUY ASSEMBLY	
281	ST101	BASE BID - 112TRAM JOINTS DECK MILL AND OVERLAY LIMITS	1 OF 3	343	Y031	STRUCTURAL DETAILS TYPICAL FOUNDATION DETAIL	
282	ST102	BASE BID - 112TRAM JOINTS DECK MILL AND OVERLAY LIMITS	2 OF 3	344	Y033	STRUCTURAL DETAILS STREETLIGHT POLE FOUNDATION DETAIL	
283	ST103	BASE BID - 112TRAM JOINTS DECK MILL AND OVERLAY LIMITS	3 OF 3	345	Y034	STRUCTURAL DETAILS 2 FT DIAMETER FOUNDATION DETAIL	
284	ST104	BASE BID - 112TRAM JOINTS MODIFIED FINGER JOINT PLAN	PIERS 2 AND 5	346	Y035	STRUCTURAL DETAILS ROCK SOCKET AND DOWN GUY FOUNDATION DETAILS	
285	ST105	BASE BID - 112TRAM JOINTS MODIFIED FINGER JOINT PLAN	PIER 8	347	Y036	STRUCTURE DETAIL TYPICAL SPREAD FOOTING FOUNDATION DETAIL	
286	ST106	BASE BID - 112TRAM JOINTS FINGER JOINT MODIFICATION DETAILS		348	Y037	POLE INSTALLATION DETAILS AT GRAND BOULEVARD VIADUCT	SHEET 1 OF 2
287	ST107	BASE BID - 112TRAM JOINTS STRIP SEAL PLAN	PIERS 11 AND 12	349	Y038	POLE INSTALLATION DETAILS AT GRAND BOULEVARD VIADUCT	SHEET 2 OF 2
288	ST108	BASE BID - 112TRAM JOINTS STRIP SEAL DETAILS		350	Y039	STRUCTURAL DETAILS ANCHOR BOLT DETAIL	
289	ST109	BASE BID - 112TRAM JOINTS BRIDGE TYPICAL SECTIONS		351	Y041	BRACKET ARM ASSEMBLIES SINGLE PIPE BRACKET ARM	
BRIDGE TRACK DRAIN DETAILS				352	Y042	BRACKET ARM ASSEMBLIES DOUBLE PIPE BRACKET ARM	
290	ST201	PLAN VIEW - ABUTMENT 2 - TRACK DRAIN		353	Y043	BRACKET ARM ASSEMBLIES OVERLAP SINGLE PIPE BRACKET ARM	
291	ST202	APPROACH SLAB EXPANSION JOINT DRAIN DETAIL		354	Y044	BRACKET ARM ASSEMBLIES POLE CLAMP DETAILS	
292	ST203	EXISTING MSE WALLS		355	Y045	BRACKET ARM ASSEMBLIES BRACKET ARM POLE SOCKET	
293	ST204	TRACK SLAB DETAIL - OVER UTILITY VAULT		356	Y046	BRACKET ARM ASSEMBLIES OVERLAP BRACKET ARM MOUNTING BRACKET DETAIL	
BRIDGE DETAILS 115RE				357	Y047	BRACKET ARM ASSEMBLIES SECTION INSULATOR SUPPORT	
294	ST300	BID ALTERNATE - 115RE JOINTS GENERAL NOTES		358	Y051	SPAN WIRE ARRANGEMENTS CROSS SPAN DETAILS	
295	ST301	BID ALTERNATE - 115RE JOINTS MILL AND OVERLAY LIMITS - ABUT 1		359	Y052	SPAN WIRE ARRANGEMENTS HEADSPAN ASSEMBLY	
296	ST302	BID ALTERNATE - 115RE JOINTS CONCRETE REMOVAL - PIER 2		360	Y056	REGISTRATION ASSEMBLIES PULLOVER ASSEMBLIES	SHEET 1 OF 2
297	ST303	BID ALTERNATE - 115RE JOINTS CONCRETE REMOVAL - PIER 5		361	Y057	REGISTRATION ASSEMBLIES PULLOVER ASSEMBLIES	SHEET 2 OF 2
298	ST304	BID ALTERNATE - 115RE JOINTS CONCRETE REMOVAL - PIER 8		362	Y058	REGISTRATION ASSEMBLIES PENDULUM SUSPENSION ASSEMBLIES	
299	ST305	BID ALTERNATE - 115RE JOINTS CONCRETE REMOVAL - PIER 11		363	Y059	REGISTRATION ASSEMBLIES SUSPENSION ASSEMBLIES	
300	ST306	BID ALTERNATE - 115RE JOINTS CONCRETE REMOVAL - PIER 12					
301	ST307	BID ALTERNATE - 115RE JOINTS FINGER JOINT MODIFICATION PLAN - PIERS 2 & 5					

REV	DATE	DESCRIPTION	DESIGNED BY	MMO		 <p>This set of plans is not for construction. These plans are intended to build interest in bidding the project.</p>	ISSUED FOR BID	DATE: 12-23-2022	KANSAS CITY STREETCAR - RIVERFRONT EXTENSION	SCALE FOR 22"x34": NOT TO SCALE FILENAME: G012.dgn CONTRACT NO.: CONTRACT NO. *** VOLUME: 1	DRAWING NO.: G012	SHEET NO.: 4
			CHECKED BY	JWR			 <p>HDR Engineering, Inc. 10450 Holmes Road Suite 600 Kansas City, MO 64131-3471 816-380-2700 Certificate of Authority: 000856</p>	NOT FOR CONSTRUCTION				
			DRAWN BY	MMO								
			CHECKED BY	JWR								
			APPROVED BY	NKS								
PLOT DATE: \$DATE\$			\$TIME\$		DATE	12-23-2022	INDEX OF DRAWINGS SHEET 3					



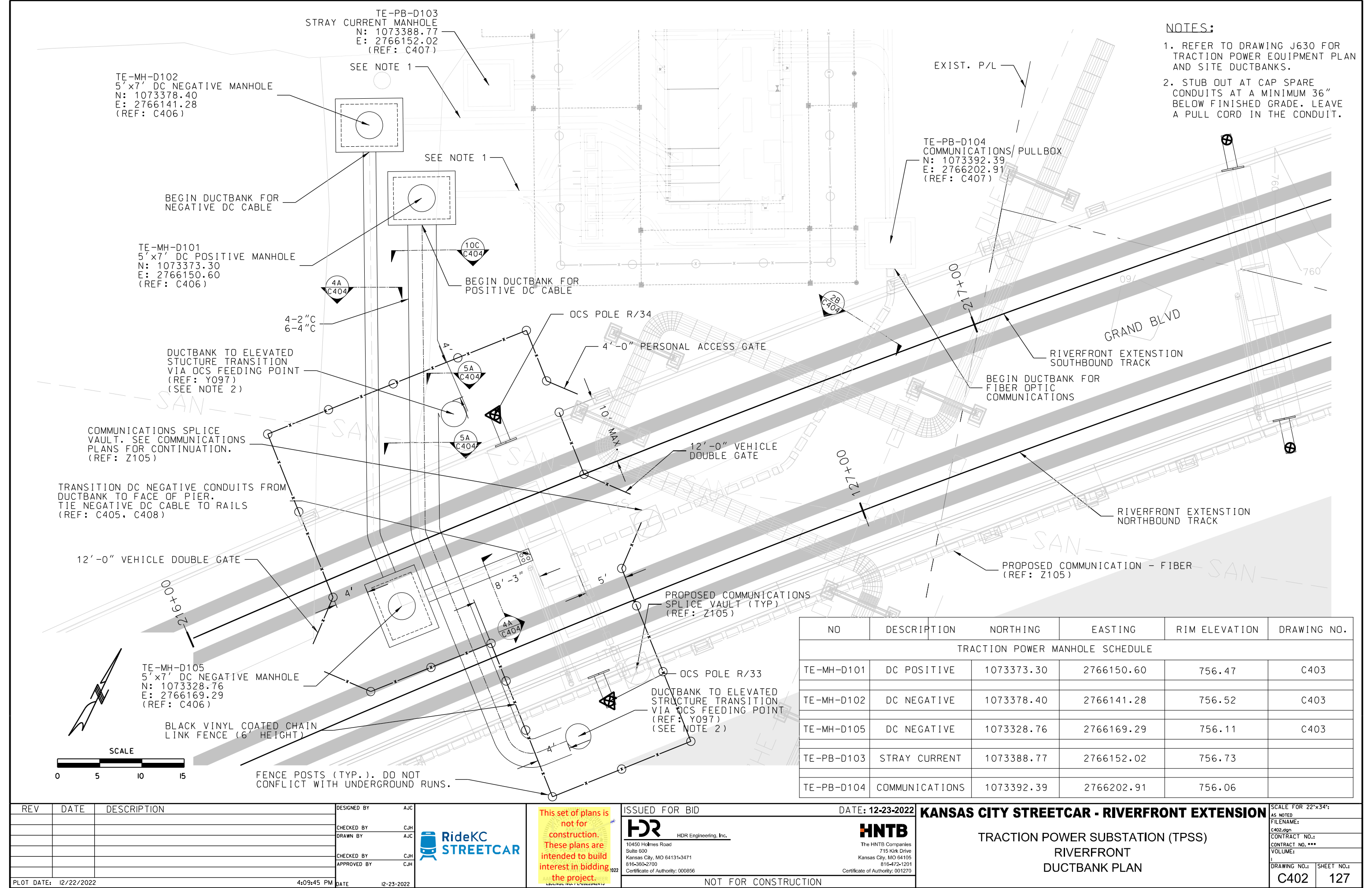
#	dwg	TITLE	DESCRIPTION	#	dwg	TITLE	DESCRIPTION
364	Y061	IN-SPAN ASSEMBLIES JUMPER ASSEMBLIES		427	Z618	COMMUNICATIONS DETAILS	RING DIAGRAM SHEET 4
365	Y062	IN-SPAN ASSEMBLIES SECTION INSULATOR ASSEMBLY		428	Z619	COMMUNICATIONS DETAILS	RING DIAGRAM SHEET 5
366	Y063	IN-SPAN ASSEMBLIES TYPICAL SPLICE DETAILS		429	Z620	COMMUNICATIONS DETAILS	3RD ST SPLICE
367	Y064	IN-SPAN ASSEMBLIES SPAN SPACER AND CROSS CONTACT WIRE CLAMP ASSEMBLIES		430	Z621	COMMUNICATIONS DETAILS	3RD ST SPLICE INSET
368	Y065	IN-SPAN ASSEMBLIES CONTACT WIRE PROTECTION BOARD		431	Z622	COMMUNICATIONS DETAILS	2ND ST SPLICE
369	Y066	SWITCHING AND FEEDER ASSEMBLIES FEEDER TAP DETAILS		432	Z623	COMMUNICATIONS DETAILS	SUB STATION SPLICE
370	Y067	SWITCHING AND FEEDER ASSEMBLIES SURGE ARRESTER DETAILS		433	Z624	COMMUNICATIONS DETAILS	BERKLEY PKWY SPLICE
371	Y068	SECTIONALIZING DIAGRAM		434	Z625	COMMUNICATIONS DETAILS	RIVERFRONT SPLICE DIAGRAM
372	Y069	POLE GROUND WIRE INSTALLATION GRAND BOULEVARD VIADUCT PIERS		435	Z626	COMMUNICATIONS DETAILS	RIVERFRONT STATION SPLICE
373	Y070	SWITCHING FEEDER ASSEMBLIES FEEDER TAP DETAILS		436	Z627	ITS CONDUIT HANGER DETAILS	
374	Y071	TERMINATION ASSEMBLIES FIXED TERMINATION ASSEMBLY		437	Z628	CONDUIT TRANSITION DETAIL	
375	Y072	TERMINATION ASSEMBLIES SPRING TENSIONER TERMINATION ASSEMBLY		438	Z629	ITS CONDUIT TRANSITION BOX DETAIL	
376	Y081	MISCELLANEOUS POLE NUMBERING DETAIL		439	Z630	ITS CONDUIT EXPANSION/DEFLECTION POINT	
377	Y092	CROSS SECTION HEART OF AMERICA BRIDGE		440	Z631	ITS CONDUIT RISER	
378	Y093	PROFILES HEART OF AMERICA	SHEET 1 OF 2	TRAIN CONTROL PLANS			
379	Y094	PROFILES HEART OF AMERICA	SHEET 2 OF 2	441	N101	TRAIN CONTROL PLAN	3RD & GRAND
380	Y097	CROSS SECTION OCS FEEDING POINT		442	N102	TRAIN CONTROL PLAN	2ND & GRAND
381	Y111	STRUCTURE SCHEDULE POLE AND FOUNDATION SCHEDULE	SHEET 1 OF 2	443	N103	TRAIN CONTROL PLAN	FRONT & BERKLEY
382	Y112	STRUCTURE SCHEDULE POLE AND FOUNDATION SCHEDULE	SHEET 2 OF 2	444	N104	TRAIN CONTROL PLAN	RIVERFRONT
OCS LAYOUT PLANS				445	N105	TRAIN CONTROL PLAN	VMF
383	Y198	KEY MAP		TRAIN SIGNALING			
384	Y199	MASTER OVERLAP CHART		446	N600	TRAIN CONTROL TRACK AND CABLE PLAN	3RD & GRAND
385	Y201	OCS LAYOUT PLAN	NB STA BEGIN TO STA 113+00	447	N601	TRAIN CONTROL TRACK AND CABLE PLAN	2ND & GRAND
386	Y202	OCS LAYOUT PLAN	NB STA 113+00 TO STA 117+00	448	N602	TRAIN CONTROL TRACK AND CABLE PLAN	FRONT STREET
387	Y203	OCS LAYOUT PLAN	NB STA 117+00 TO STA 121+00	449	N603	TRAIN CONTROL TRACK AND CABLE PLAN	RIVERFRONT
388	Y204	OCS LAYOUT PLAN	NB STA 121+00 TO STA 125+00	450	N604	TRAIN CONTROL ROUTE AND ASPECT CHART	3RD & GRAND
389	Y205	OCS LAYOUT PLAN	NB STA 125+00 TO STA 129+00	451	N605	TRAIN CONTROL ROUTE AND ASPECT CHART	2ND & GRAND
390	Y206	OCS LAYOUT PLAN	NB STA 129+00 TO STA 133+00	452	N606	TRAIN CONTROL ROUTE AND ASPECT CHART	RIVERFRONT
391	Y207	OCS LAYOUT PLAN	NB STA 133+00 TO STA 135+50	453	N607	TRAIN CONTROL TURNOUT BONDING	
392	Y208	OCS LAYOUT PLAN	NB STA 135+50 TO STA 139+50	454	N608	TRAIN CONTROL	TYPICAL SIGNAL CASE LAYOUT RELAY CASE
393	Y209	OCS LAYOUT PLAN	NB STA 139+50 TO STA 143+50	455	N609	TRAIN CONTROL	TYPICAL SIGNAL CASE FOUNDATION AND GROUNDING DETAILS
394	Y210	OCS LAYOUT PLAN	NB STA 143+50 TO STA 147+50	456	N610	TRAIN CONTROL	TYPICAL TWC LOOP INSTALLATION EMBEDDED TRACK
395	Y211	OCS LAYOUT PLAN	NB STA 147+50 TO END	457	N611	TRAIN CONTROL	CABLE / CONDUIT SCHEDULE
396	Y212	OCS BRIDGE GROUNDING LAYOUT PLAN	STA 117+00 TO STA 121+00	458	N612	TRAIN CONTROL	CABLE / CONDUIT SCHEDULE
397	Y213	OCS BRIDGE GROUNDING LAYOUT PLAN	STA 121+00 TO STA 125+00	459	N613	TRAIN CONTROL	CABLE / CONDUIT SCHEDULE
398	Y214	OCS BRIDGE GROUNDING LAYOUT PLAN	STA 125+00 TO STA 129+00	RIGHT OF WAY PLANS			
399	Y215	OCS BRIDGE GROUNDING LAYOUT PLAN	STA 129+00 TO STA 133+00	460	RW001	RIGHT OF WAY KEY MAP	
400	Y216	OCS LAYOUT PLAN	2ND STREET TO VMF	461	RW101	RIGHT OF WAY PLAN	100 GRAND BLVD
401	Y217	OCS LAYOUT PLAN	ENLARGED VIEW	462	RW102	RIGHT OF WAY PLAN	101 GRAND BLVD
COMMUNICATION SCHEDULES				463	RW103	RIGHT OF WAY PLAN	599 E RIVERFRONT ROAD - SHEET 1
402	Z001	COMMUNICATION SCHEDULE		464	RW104	RIGHT OF WAY PLAN	599 E RIVERFRONT ROAD - SHEET 2
COMMUNICATION PLANS				465	RW105	RIGHT OF WAY PLAN	599 E RIVERFRONT ROAD - SHEET 3
403	Z101	COMMUNICATIONS PLAN	NB STA BEGIN TO STA 113+00	466	RW106	RIGHT OF WAY PLAN	599 E RIVERFRONT ROAD - SHEET 4
404	Z102	COMMUNICATIONS PLAN	NB STA 113+00 TO STA 117+00	DETOUR PLAN			
405	Z103	COMMUNICATIONS PLAN	NB STA 117+00 TO STA 121+00	467	DT101	DETOUR PLAN	
406	Z104	COMMUNICATIONS PLAN	NB STA 121+00 TO STA 125+00	MILL AND OVERLAY PLANS			
407	Z105	COMMUNICATIONS PLAN	NB STA 125+00 TO STA 129+00	468	R101	ROADWAY MILL AND OVERLAY PLAN AND PROFILE	STA 0+00 TO STA 4+00
408	Z106	COMMUNICATIONS PLAN	NB STA 129+00 TO STA 133+00	469	R102	ROADWAY MILL AND OVERLAY PLAN AND PROFILE	STA 4+00 TO STA 8+00
409	Z107	COMMUNICATIONS PLAN	NB STA 133+00 TO STA 135+50	470	R103	ROADWAY MILL AND OVERLAY PLAN AND PROFILE	STA 19+00 TO STA 23+00
410	Z108	COMMUNICATIONS PLAN	NB STA 135+50 TO STA 139+50	471	R104	ROADWAY MILL AND OVERLAY PLAN AND PROFILE	STA 23+00 TO STA 28+00
411	Z109	COMMUNICATIONS PLAN	NB STA 139+50 TO STA 143+50	472	R105	ROADWAY MILL AND OVERLAY PLAN AND PROFILE	2ND STREET TO VMF
412	Z110	COMMUNICATIONS PLAN	NB STA 143+50 TO STA 147+50	473	R201	ROADWAY MILL AND OVERLAY	ALIGNMENT TABLE GRAND BOULEVARD & BERKLEY PARKWAY
413	Z111	COMMUNICATIONS PLAN	NB STA 147+50 TO END	MILL AND OVERLAY CROSS SECTIONS			
414	Z112	COMMUNICATIONS PLAN	2ND STREET TO VMF	474	XS01	ROADWAY MILL AND OVERLAY CROSS SECTIONS	GRAND BOULEVARD
COMMUNICATION DETAILS				475	XS02	ROADWAY MILL AND OVERLAY CROSS SECTIONS	GRAND BOULEVARD
415	Z601	SYSTEMWIDE ELECTRICAL	TYPICAL MANHOLE DETAILS	476	XS03	ROADWAY MILL AND OVERLAY CROSS SECTIONS	GRAND BOULEVARD
416	Z602	SYSTEMWIDE ELECTRICAL	MANHOLE INSTALLATION AND SWITCH HEATER/TRACK CIRCUIT BLOCKOUT DETAILS	477	XS04	ROADWAY MILL AND OVERLAY CROSS SECTIONS	GRAND BOULEVARD
417	Z603	SYSTEMWIDE ELECTRICAL	FIBER OPTIC SPLICE VAULT	478	XS05	ROADWAY MILL AND OVERLAY CROSS SECTIONS	GRAND BOULEVARD
418	Z604	SYSTEMWIDE ELECTRICAL	HANDHOLE DETAILS	479	XS06	ROADWAY MILL AND OVERLAY CROSS SECTIONS	GRAND BOULEVARD
419	Z606	SYSTEMWIDE ELECTRICAL	TYPICAL TRACK CIRCUIT BLOCKOUT DETAIL	480	XS07	ROADWAY MILL AND OVERLAY CROSS SECTIONS	BERKLEY PARKWAY
420	Z607	SYSTEMWIDE ELECTRICAL	TRACK TURNOUT BLOCKOUT DETAIL	481	XS08	ROADWAY MILL AND OVERLAY CROSS SECTIONS	BERKLEY PARKWAY
421	Z608	SYSTEMWIDE ELECTRICAL	TYPICAL DUCTBANK INSTALLATION MANHOLE AND CONDUIT LABELING AND CONDUIT STUB-UP DETAIL	482	XS09	ROADWAY MILL AND OVERLAY CROSS SECTIONS	BERKLEY PARKWAY
422	Z609	SYSTEMWIDE ELECTRICAL	COMMUNICATION CONDUIT TYPICAL SECTIONS	483	XS10	ROADWAY MILL AND OVERLAY CROSS SECTIONS	2ND STREET
423	Z614	COMMUNICATIONS DETAILS	NETWORK DIAGRAM	484	XS11	ROADWAY MILL AND OVERLAY CROSS SECTIONS	2ND STREET
424	Z615	COMMUNICATIONS DETAILS	RING DIAGRAM SHEET 1	485	XS12	ROADWAY MILL AND OVERLAY CROSS SECTIONS	2ND STREET
425	Z616	COMMUNICATIONS DETAILS	RING DIAGRAM SHEET 2	486	XS13	ROADWAY MILL AND OVERLAY CROSS SECTIONS	2ND STREET
426	Z617	COMMUNICATIONS DETAILS	RING DIAGRAM SHEET 3				

REV	DATE	DESCRIPTION	DESIGNED BY	MMO		<div>This set of plans is not for construction. These plans are intended to build interest in bidding the project.</div>	ISSUED FOR BID	DATE: 12-23-2022	KANSAS CITY STREETCAR - RIVERFRONT EXTENSION	SCALE FOR 22"x34": NOT TO SCALE FILENAME: G013.dgn CONTRACT NO.: CONTRACT NO. *** VOLUME: 1	DRAWING NO.: G013	SHEET NO.: 5				
			CHECKED BY	JWR			 <div>HDR Engineering, Inc. 10450 Holmes Road Suite 600 Kansas City, MO 64131-3471 816-360-2700 Certificate of Authority: 000856</div>	INDEX OF DRAWINGS SHEET 4								
			DRAWN BY	MMO												
			CHECKED BY	JWR												
			APPROVED BY	NKS												
PLOT DATE: \$DATE\$			\$TIME\$		DATE	12-23-2022	NOT FOR CONSTRUCTION									



- NOTES:**
1. REFER TO DRAWING J630 FOR TRACTION POWER EQUIPMENT PLAN AND SITE DUCTBANKS
  2. PROVIDE A MINIMUM OF 3" ASPHALT COVER OVER THE ENTIRE SITE. EXTEND THE ASPHALT COVER AT LEAST 6" BEYOND THE GROUND GRID LIMITS. REFER TO J632 FOR GROUND GRID PLAN.
  3. CONTRACTOR SHALL VERIFY ALL TPSS BUILDING AND FOUNDATION(S) DIMENSIONS AGAINST APPROVED SUBMITTALS BEFORE COMMENCING CONSTRUCTION.

REV	DATE	DESCRIPTION	DESIGNED BY	AJC		<p>This set of plans is not for construction. These plans are intended to build interest in bidding the project.</p>	ISSUED FOR BID		DATE: 12-23-2022	KANSAS CITY STREETCAR - RIVERFRONT EXTENSION			SCALE FOR 22"x34": AS NOTED	
			CHECKED BY	CJH						<p>TRACTION POWER SUBSTATION (TPSS) RIVERFRONT GRADING PLAN</p>		DRAWING NO.: C401	SHEET NO.: 126	
			DRAWN BY	AJC										
			CHECKED BY	CJH			10450 Holmes Road Suite 800 Kansas City, MO 64113-3471 816-360-2700 Certificate of Authority: 000856							
			APPROVED BY	CJH			The HNTB Companies 715 Kirk Drive Kansas City, MO 64105 816-472-1201 Certificate of Authority: 001270							
PLOT DATE: 12/22/2022			4:09:42 PM		DATE	12-23-2022	NOT FOR CONSTRUCTION							



- NOTES:
1. REFER TO DRAWING J630 FOR TRACTION POWER EQUIPMENT PLAN AND SITE DUCTBANKS.
  2. STUB OUT AT CAP SPARE CONDUITS AT A MINIMUM 36" BELOW FINISHED GRADE. LEAVE A PULL CORD IN THE CONDUIT.

NO	DESCRIPTION	NORTHING	EASTING	RIM ELEVATION	DRAWING NO.
TRACTION POWER MANHOLE SCHEDULE					
TE-MH-D101	DC POSITIVE	1073373.30	2766150.60	756.47	C403
TE-MH-D102	DC NEGATIVE	1073378.40	2766141.28	756.52	C403
TE-MH-D105	DC NEGATIVE	1073328.76	2766169.29	756.11	C403
TE-PB-D103	STRAY CURRENT	1073388.77	2766152.02	756.73	
TE-PB-D104	COMMUNICATIONS	1073392.39	2766202.91	756.06	

REV	DATE	DESCRIPTION
PLOT DATE: 12/22/2022		

DESIGNED BY	AJC
CHECKED BY	CJH
DRAWN BY	AJC
CHECKED BY	CJH
APPROVED BY	CJH
DATE 12-23-2022	



This set of plans is not for construction. These plans are intended to build interest in bidding the project.

ISSUED FOR BID

DATE: 12-23-2022

HDR Engineering, Inc.  
10450 Holmes Road  
Suite 800  
Kansas City, MO 64131-3471  
816-360-2700  
Certificate of Authority: 000856

The HNTB Companies  
715 Kirk Drive  
Kansas City, MO 64105  
816-472-1201  
Certificate of Authority: 001270

NOT FOR CONSTRUCTION

KANSAS CITY STREETCAR - RIVERFRONT EXTENSION

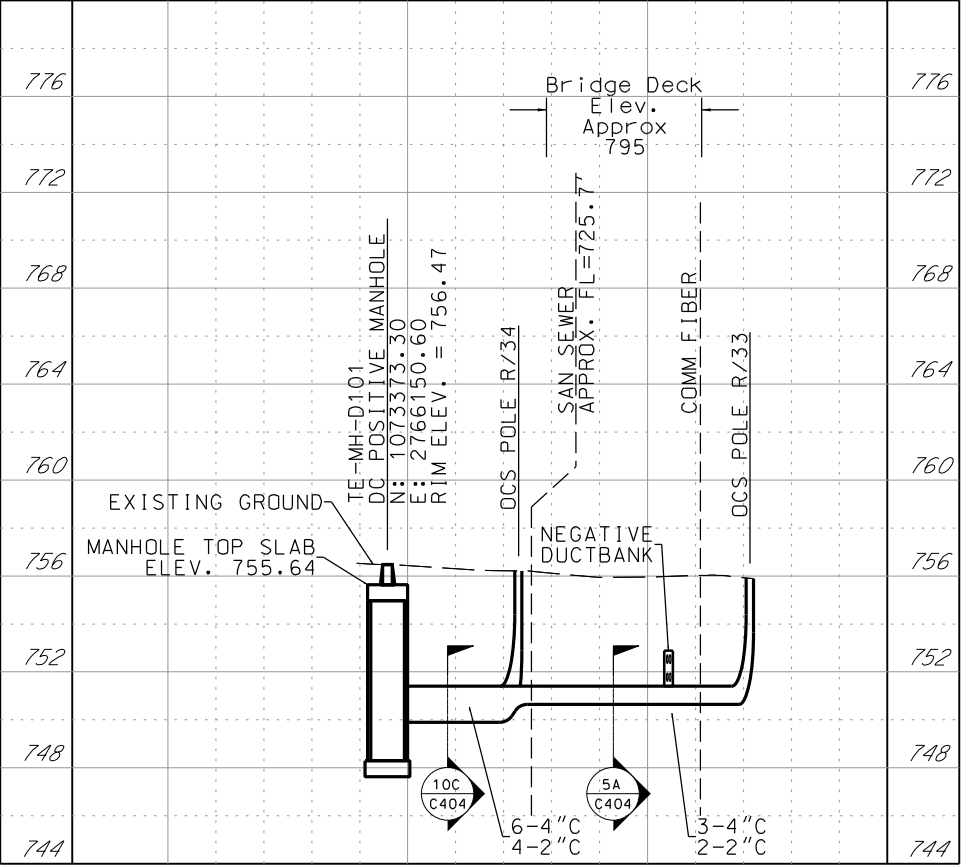
TRACTION POWER SUBSTATION (TPSS)

RIVERFRONT

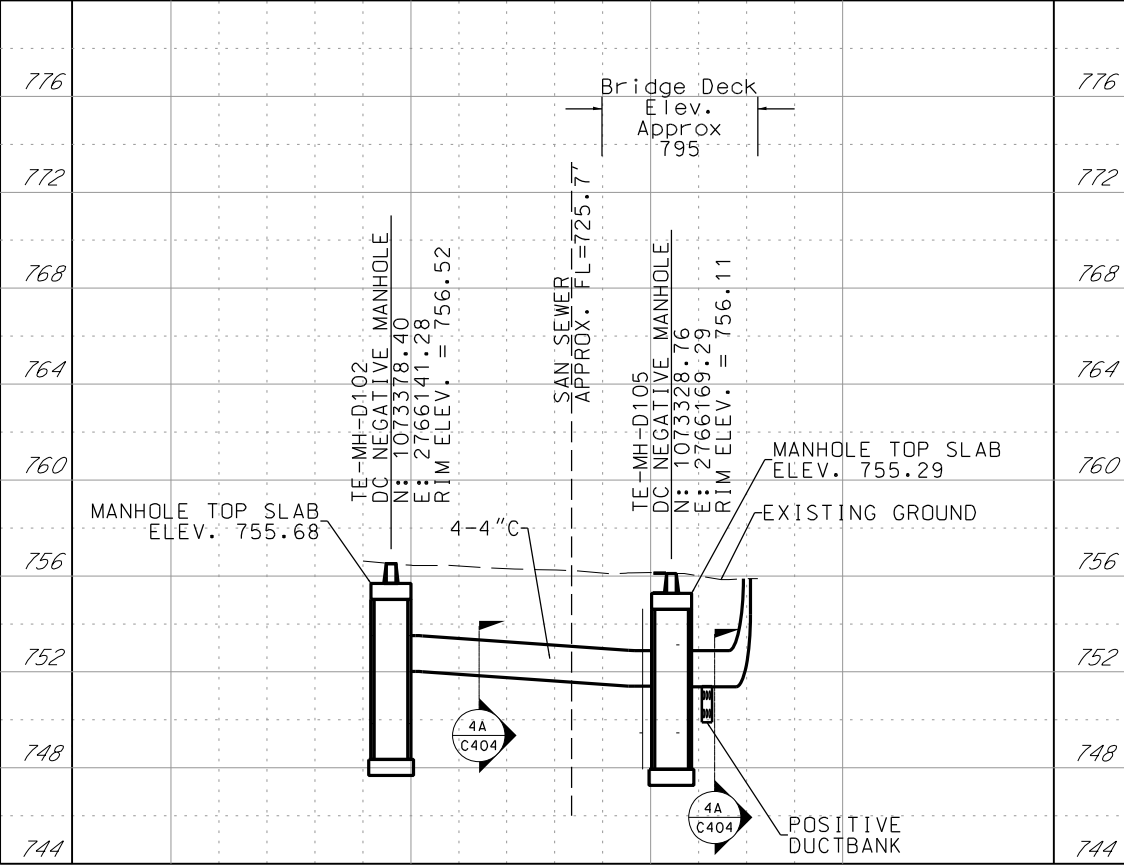
DUCTBANK PLAN

SCALE FOR 22"x34": AS NOTED	FILENAME: C402.dgn
CONTRACT NO.: CONTRACT NO. ***	VOLUME:
DRAWING NO.: C402	SHEET NO.: 127

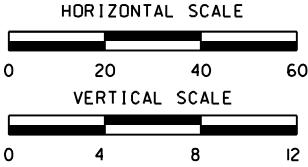







DC POSITIVE DUCTBANK

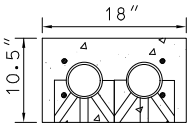


DC NEGATIVE DUCTBANK



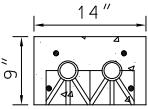
REV	DATE	DESCRIPTION	DESIGNED BY	AJC		<div>This set of plans is not for construction. These plans are intended to build interest in bidding the project.</div>	ISSUED FOR BID		DATE: 12-23-2022	KANSAS CITY STREETCAR - RIVERFRONT EXTENSION			SCALE FOR 22"x34":	
			CHECKED BY	CJH			 HDR Engineering, Inc.		 The HNTB Companies				AS NOTED	
			DRAWN BY	AJC			10450 Holmes Road Suite 600 Kansas City, MO 64131-3471 816-360-2700 Certificate of Authority: 000856		715 Kirk Drive Kansas City, MO 64105 816-472-1201 Certificate of Authority: 001270		FILENAME: C403.dgn			
			CHECKED BY	CJH							CONTRACT NO.:			
			APPROVED BY	CJH							CONTRACT NO. ***			
PLOT DATE: 12/22/2022			4:09:48 PM		DATE	12-23-2022	NOT FOR CONSTRUCTION					DRAWING NO.:	SHEET NO.:	
												C403	128	





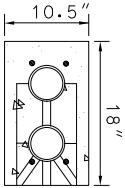
2 - 4" PVC (1H X 2W)  
SCALE: 1" = 1'-0"

2A  
-



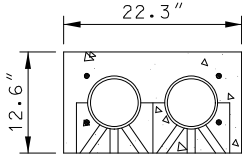
2 - 2" PVC (1H X 2W)  
SCALE: 1" = 1'-0"

2B  
-



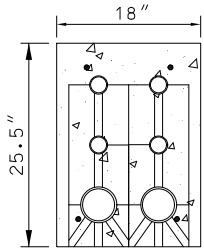
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SCALE: 1" = 1'-0"

2C  
-



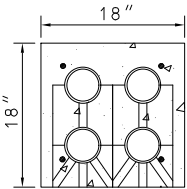
2 - 6" PVC (1H X 2W)  
SCALE: 1" = 1'-0"

2D  
-



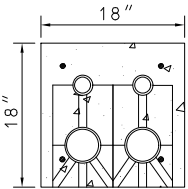
2 - 4" PVC AND  
4 - 2" PVC (3H X 2W)  
SCALE: 1" = 1'-0"

3A  
-



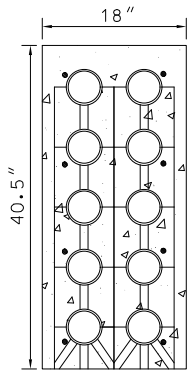
4 - 4" PVC (2H X 2W)  
SCALE: 1" = 1'-0"

4A  
-



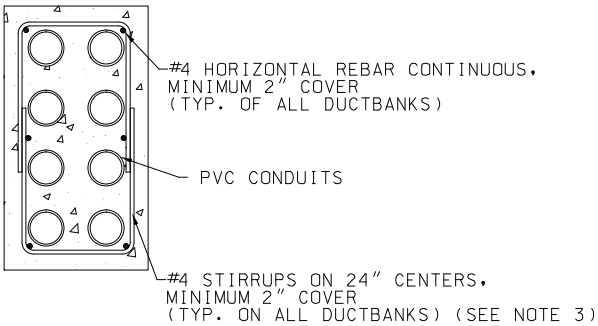
2 - 4" PVC AND  
2 - 2" PVC (2H X 2W)  
SCALE: 1" = 1'-0"

4C  
-

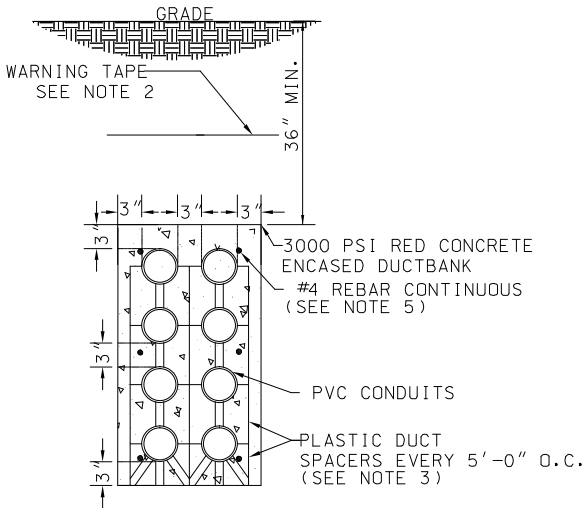


10 - 4" PVC (5H X 2W)  
SCALE: 1" = 1'-0"

10A  
-



CONCRETE ENCASED DUCTBANK  
TYPICAL REINFORCING DETAIL  
SCALE: 1" = 1'-0"

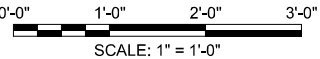


TYPICAL DUCTBANK CONFIGURATION  
CONCRETE ENCASED DUCTBANK SECTION  
SCALE: 1" = 1'-0"

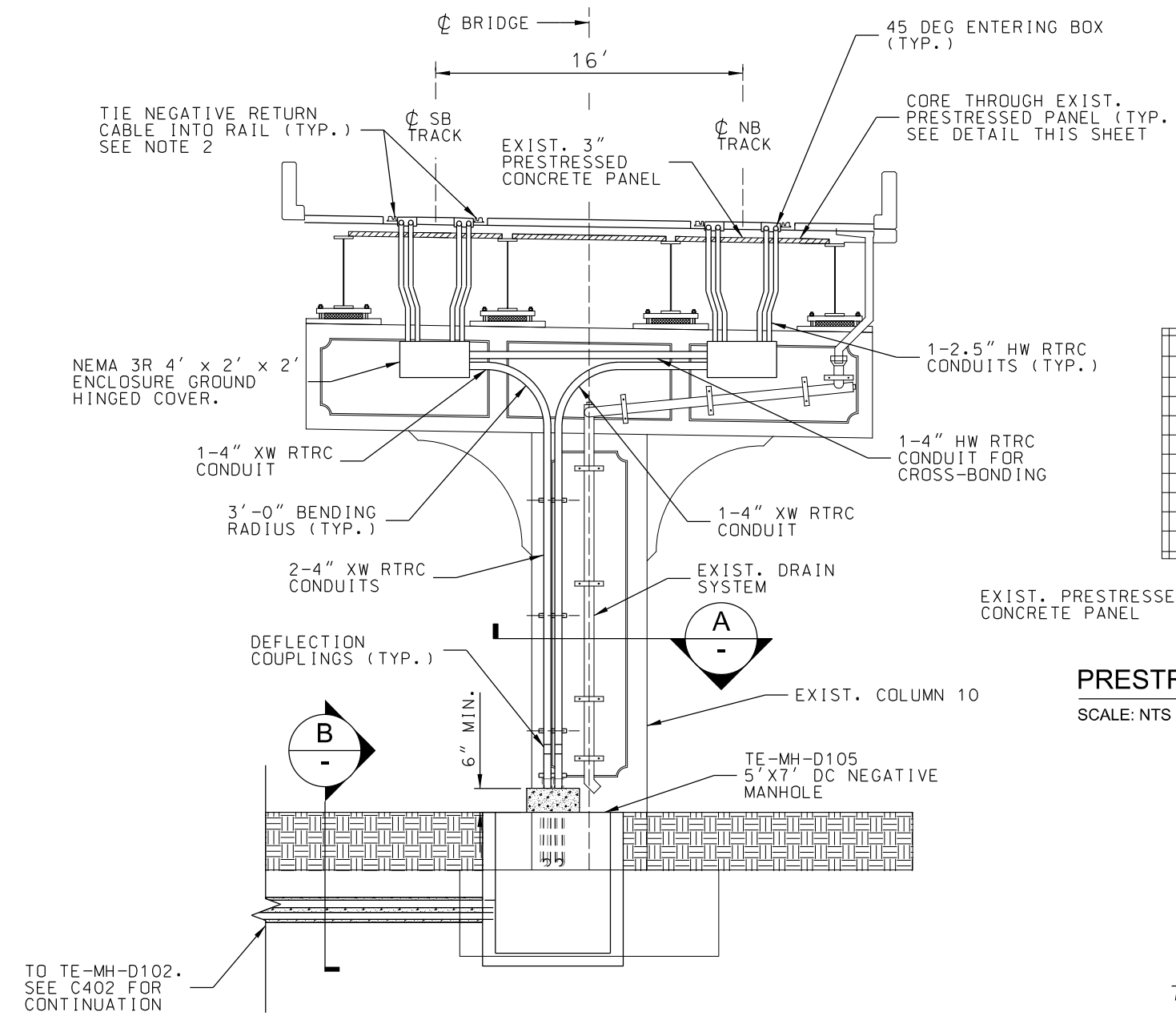
DUCTBANK REINFORCEMENT TABLE			
DB CONFIGURATION	D (DEPTH) IN	W (WIDTH) IN	N (NUMBER OF LONGITUDINAL BARS)
1H X 2W	10.5	18.0	4
1H X 2W	9	14.0	4
1H X 3W	10.5	25.5	4
1H X 3W	9	20	4
3H X 1W	20	9	4
2H X 2W	18.0	18.0	4
1H X 4W	10.5	33.0	6
3H X 2W	25.5	18.0	6
2H X 3W	18.0	25.0	6
4H X 2W	33.0	18.0	6
2H X 4W	18.0	33.0	6
1H X 8W	10.5	63.0	10
5H X 2W	40.5	18.0	8
2H X 5W	18.0	40.5	8
1H X 10W	10.5	78.0	10
1H X 10W	10.5	96.0	14
2H X 4W	18	60	10

NOTES:

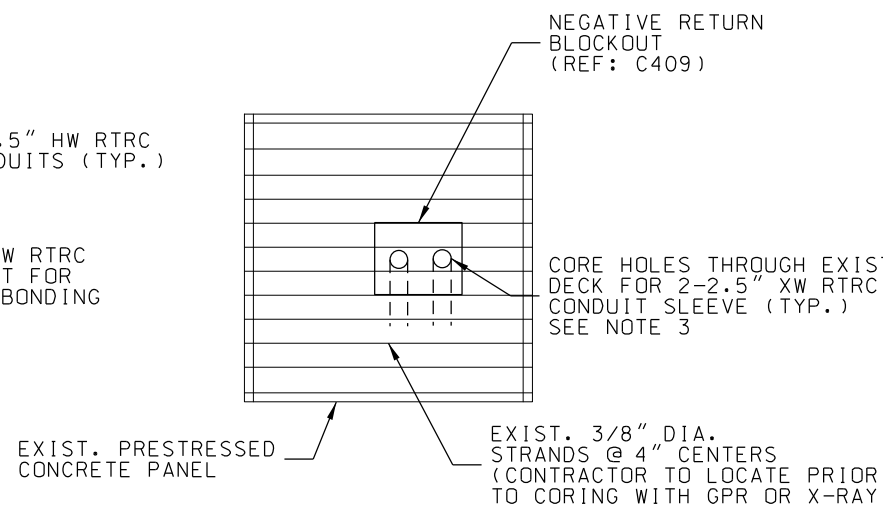
- WHERE DIRECT BURIED CONDUITS INTERSECT CONCRETE ENCASED DUCTBANKS, COVER DEPTH FOR CONDUITS SHALL BE ADJUSTED TO SUIT THE INSTALLATION AS APPROVED BY THE ENGINEER.
- PROVIDE DETECTABLE WARNING TAPE MINIMUM 9" DEPTH FROM SURFACE.
- STIRRUPS MAY BE REPLACED BY ADDING ADDITIONAL PLASTIC DUCT SPACERS AT INTERVALS OF 2.5 FT MAXIMUM SPACING AND CONNECTING HORIZONTAL REBAR TO THE SPACERS AT THE 2.5 FT MAXIMUM INTERVAL, PROVIDED NO METAL TOUCHES CONDUITS. THE SPACERS, WHICH CAN ACCOMMODATE THE REBAR CONNECTION/INSERTS SHALL BE SUBMITTED FOR APPROVAL AND APPROVED PRIOR TO INSTALLATION.
- DUCTBANK CONFIGURATION MAY BE ADJUSTED AS NEEDED BY THE CONTRACTOR TO AVOID CONFLICTS WITH EXISTING UTILITIES AND/OR OTHER ELEMENTS. THE NUMBER AND SIZE OF CONDUITS SHALL NOT BE CHANGED WITHOUT APPROVAL BY THE ENGINEER.
- THE DUCTBANK LONGITUDINAL REBAR SHALL OVERLAP A MINIMUM OF 18 INCHES OR UTILIZE THREADED REBAR DOWELS. A MINIMUM OF FOUR REBARS OR 60 PERCENT OF THE LONGITUDINAL BARS SHALL BE EPOXY EMBEDDED 3 INCHES INTO A MANHOLE WALL.



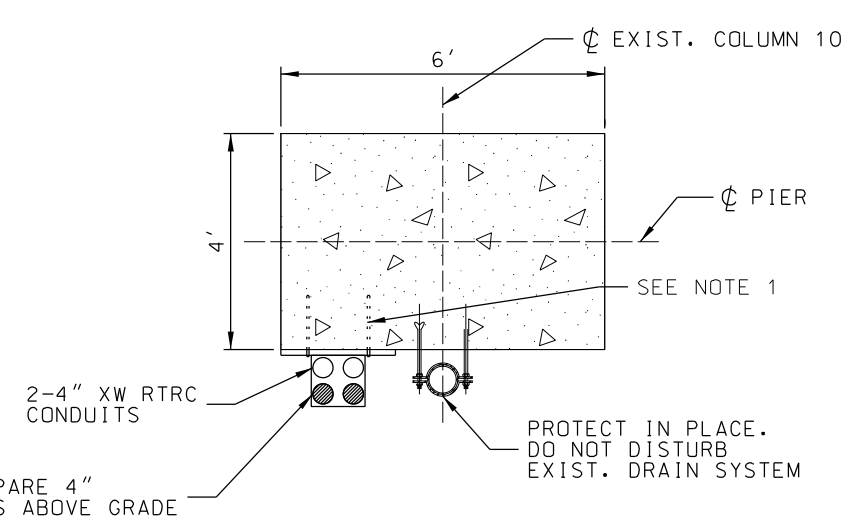
REV	DATE	DESCRIPTION	DESIGNED BY	AJC		<p>This set of plans is not for construction. These plans are intended to build interest in bidding the project.</p>	ISSUED FOR BID		DATE: 12-23-2022	KANSAS CITY STREETCAR - RIVERFRONT EXTENSION			SCALE FOR 22"x34":					
			CHECKED BY	CJH					<p>10450 Holmes Road Suite 900 Kansas City, MO 64131-3471 816-360-2700 Certificate of Authority: 000856</p>		TRACTION POWER AND SCADA SYSTEM TYPICAL DUCTBANK SECTIONS		AS NOTED					
			DRAWN BY	AJC			<p>715 Kirk Drive Kansas City, MO 64105 816-472-1201 Certificate of Authority: 001270</p>						FILENAME:					
			CHECKED BY	CJH									CONTRACT NO.:					
			APPROVED BY	CJH									CONTRACT NO. ***					
PLOT DATE: 12/22/2022			4:09:52 PM		DATE	12-23-2022	NOT FOR CONSTRUCTION						DRAWING NO.:				SHEET NO.:	
									C404				129					



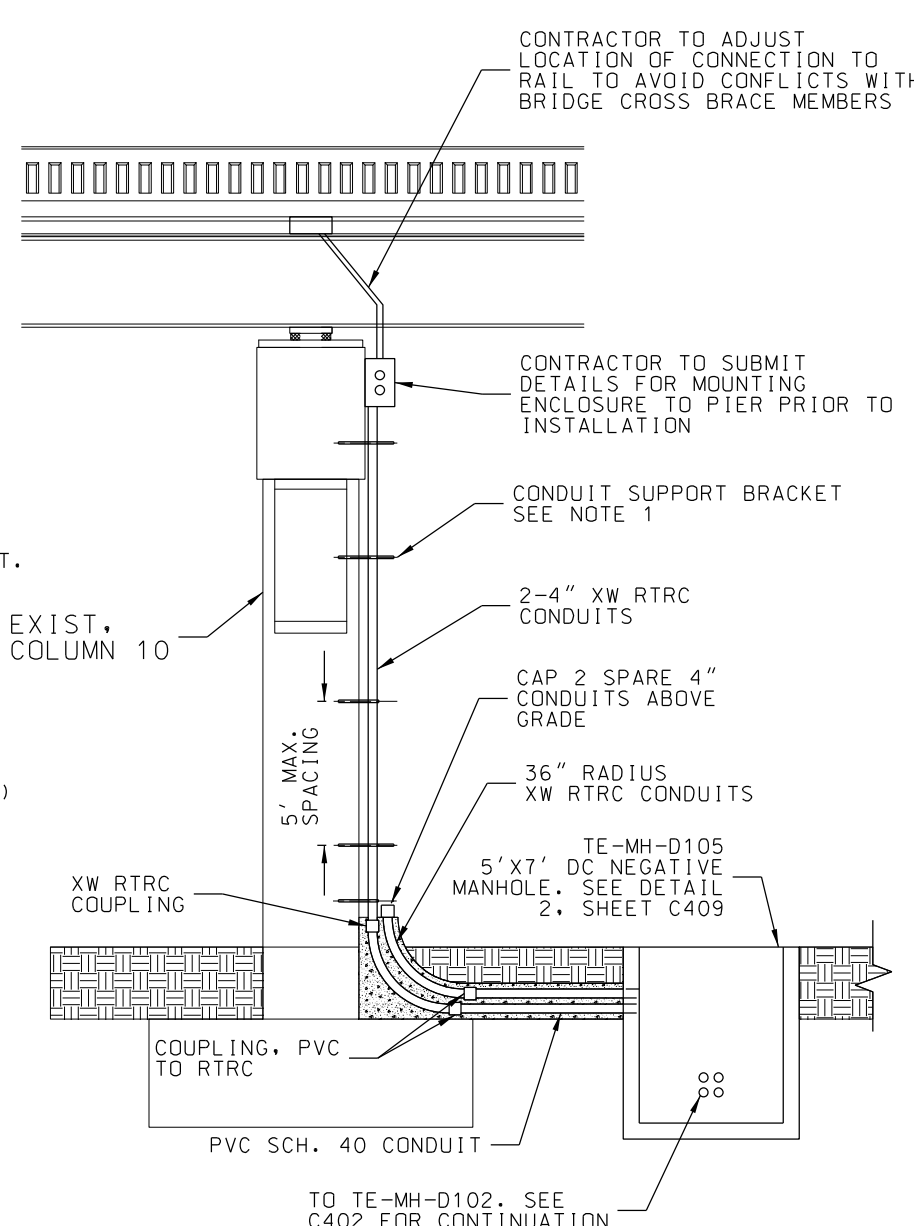
**TRACTION POWER RACEWAY AT GRADE TO ELEVATED STRUCTURE TRANSITION DETAIL**  
SCALE: NTS



**PRESTRESSED PANEL CORING DETAIL**  
SCALE: NTS



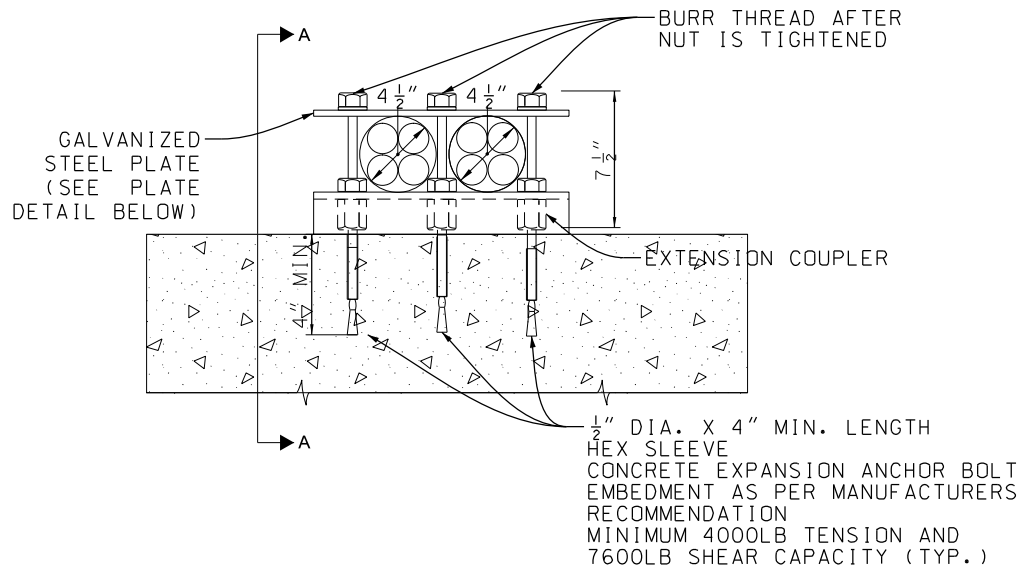
**COLUMN SECTION**  
SCALE: NTS



**SECTION B-B**  
SCALE: NTS

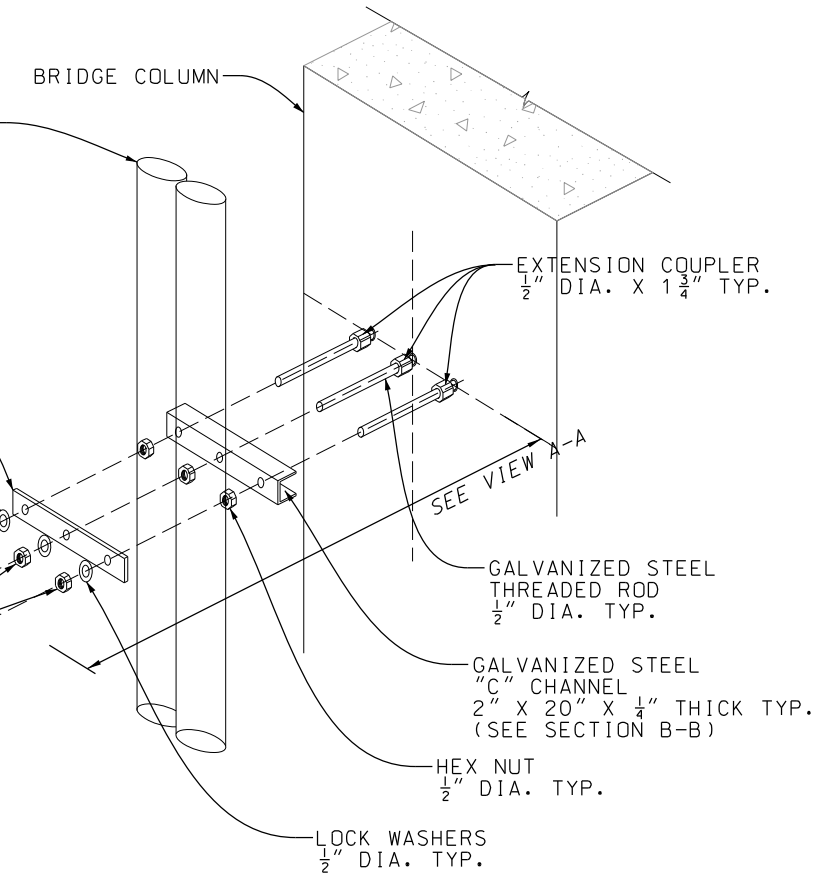
- NOTES:
- SEE C406 FOR RISER CONNECTION DETAIL
  - SEE C409 FOR NEGATIVE RETURN AND CROSS BONDING DETAILS
  - CONTRACTOR TO FIELD LOCATE CORE HOLES FOR CONDUIT TO AVOID IMPACTING PRESTRESSED STRANDS IN CONCRETE PANEL WITH GRP OR X-RAY.
  - CONTRACTOR SHALL NOT CORE THROUGH EXISTING PRESTRESSED STRANDS WITHOUT APPROVAL BY ENGINEER.

REV	DATE	DESCRIPTION	DESIGNED BY	AJC		<div>This set of plans is not for construction. These plans are intended to build interest in bidding the project.</div>	ISSUED FOR BID		DATE: 12-23-2022	<div>KANSAS CITY STREETCAR - RIVERFRONT EXTENSION</div> <div>TPSS DUCTBANK NEGATIVE RISER DETAILS</div>		SCALE FOR 22"x34": AS NOTED		
			CHECKED BY	CJH			 <div>HDR Engineering, Inc. 10450 Holmes Road Suite 600 Kansas City, MO 64131-3471 816-360-2700 Certificate of Authority: 000856</div>		 <div>The HNTB Companies 715 Kirk Drive Kansas City, MO 64105 816-472-1201 Certificate of Authority: 001270</div>			FILENAME: C405.dgn		
			DRAWN BY	AJC			NOT FOR CONSTRUCTION		VOLUME:			CONTRACT NO.: ***		
			CHECKED BY	CJH								DRAWING NO.:		
PLOT DATE: 12/22/2022			4:09:55 PM		DATE	12-23-2022					C405		130	



ITS 4" CONDUIT,  
4" DIA. NOMINAL SIZE  
(SEE PLANS FOR MATERIAL TYPE)

SEE PLATE DETAIL  
LOCK WASHERS  
1/2" DIA. TYP.  
LOCK NUTS  
1/2" DIA. TYP.



NOTES:

1. UTILIZE AN APPROXIMATE LENGTH OF FLEXIBLE CONDUIT AT EXPOSED CONNECTIONS OF 2 TIMES ANTICIPATED MOVEMENT OR 4'-0" MINIMUM.
2. SIZE ALL TRANSITION BOXES AND SURFACE MOUNTED PULL BOXES PER NATIONAL ELECTRICAL CODE ARTICLE 314 BOXES AND FITTINGS.
3. FOR UNDER BRIDGE LOCATIONS, ENSURE ALL JUNCTION BOXES ARE KEPT INACCESSIBLE FROM GENERAL PUBLIC AND PLACED A MINIMUM 10'-0" ABOVE SURROUNDING GROUND.
4. SEE PLAN SHEETS FOR NUMBER AND SIZE OF CONDUIT(S) TO BE INSTALLED.
5. ENSURE MAXIMUM SPACING BETWEEN RISER CONDUIT ATTACHMENTS IS 5'-0" C-C.
6. INSTALL CONDUIT SUPPORTS WITHIN 3'-0" OF ALL ENCLOSURES AND CONDUIT TERMINATIONS.
7. GROUND ALL RIGID METALLIC CONDUIT (RMC) HANGERS PER MANUFACTURER RECOMMENDATIONS WHEN ELECTRICAL CONDUCTORS PRESENT WITH A LOCAL GROUND ROD.
8. ENSURE ALL EXPANSION ANCHORS CONFORM TO ASTM A307.

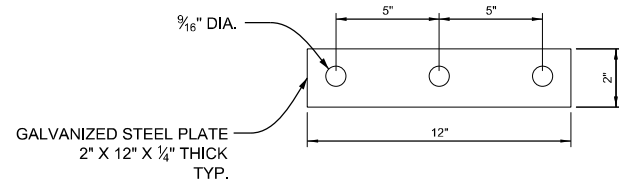
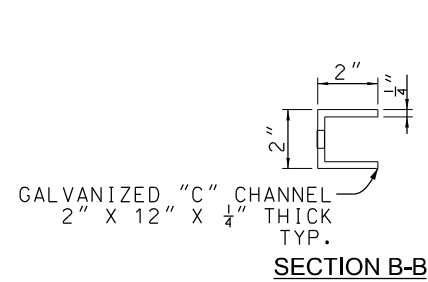
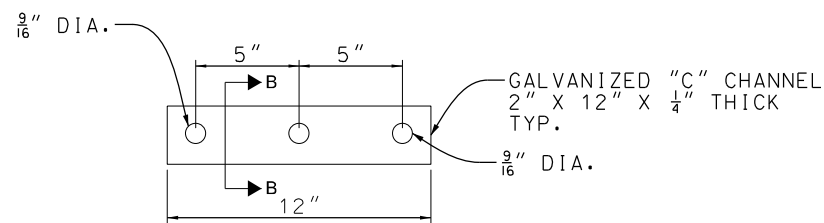


PLATE DETAIL



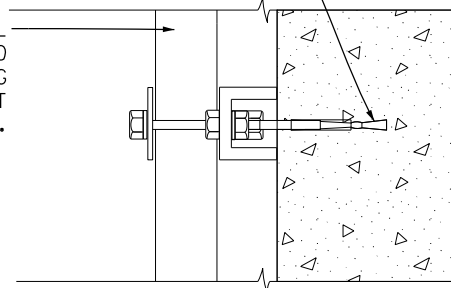
SECTION B-B



"C" CHANNEL DETAIL

1/2" DIA. X 4" MIN. LENGTH  
HEX SLEEVE  
CONCRETE EXPANSION ANCHOR BOLT  
EMBEDMENT AS PER MANUFACTURERS  
RECOMMENDATION  
MINIMUM 4000LB TENSION AND  
7600LB SHEAR CAPACITY (TYP.)

EXTRA-HEAVY WALL  
REINFORCED  
THERMOSETTING  
RESIN CONDUIT  
(XW RTRC) TYP.



VIEW A-A

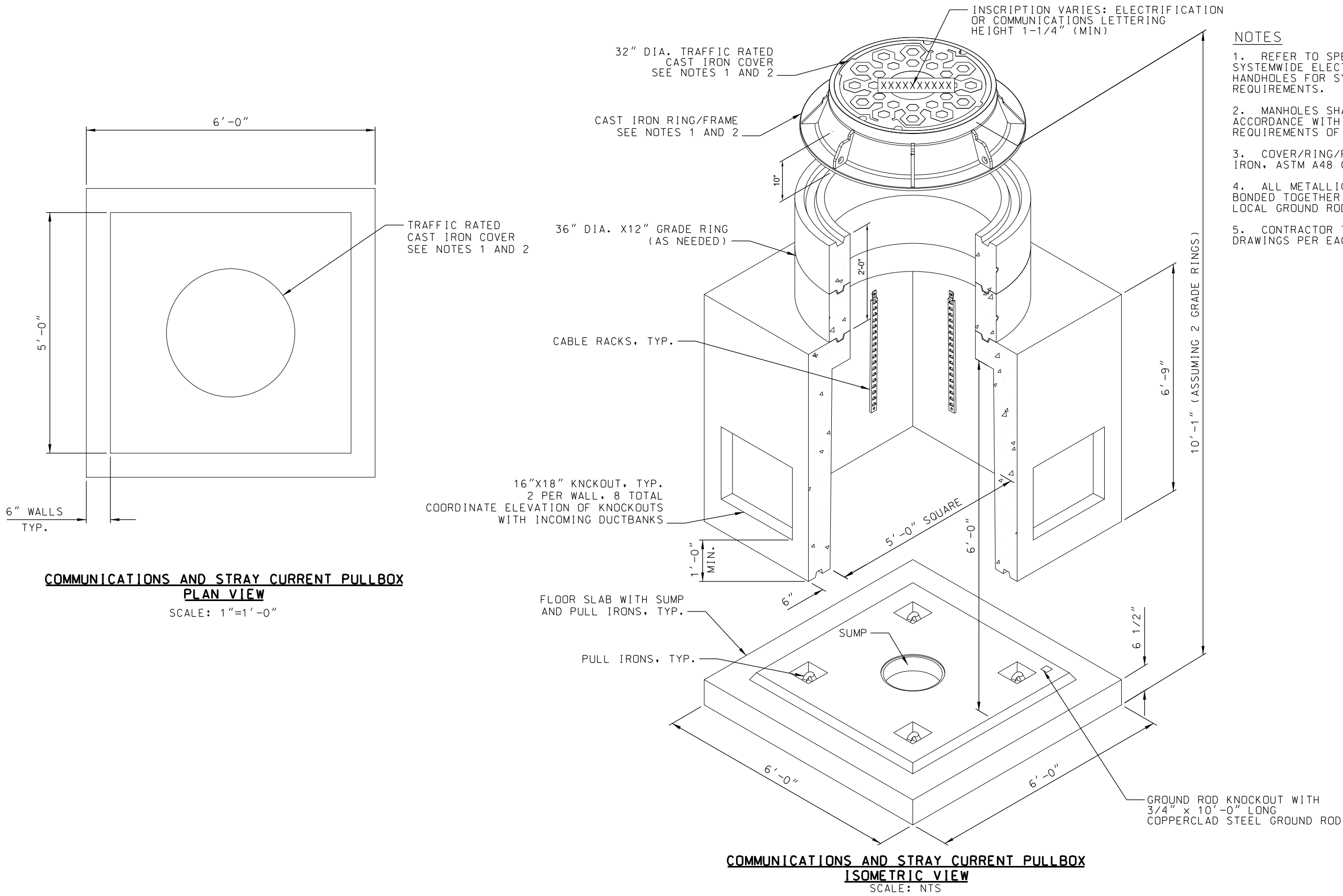
ITS RISER CONDUIT BRIDGE COLUMN ATTACHMENT

REV	DATE	DESCRIPTION	DESIGNED BY	AJC		<div>This set of plans is not for construction. These plans are intended to build interest in bidding the project.</div>	ISSUED FOR BID		DATE: 12-23-2022	KANSAS CITY STREETCAR - RIVERFRONT EXTENSION		SCALE FOR 22"x34":	
			CHECKED BY	CJH			 <div>HDR Engineering, Inc.</div>		 <div>The HNTB Companies</div>		FILENAME:		
			DRAWN BY	AJC			10450 Holmes Road Suite 600 Kansas City, MO 64113-3471 816-360-2700		715 Kirk Drive Kansas City, MO 64115 816-472-1201		CONTRACT NO.:		
			CHECKED BY	CJH			Certificate of Authority: 000856		Certificate of Authority: 001270		CONTRACT NO. ***		
			APPROVED BY	CJH							VOLUME:		
PLOT DATE: 12/22/2022			4:09:58 PM		DATE	12-23-2022	NOT FOR CONSTRUCTION				DRAWING NO.:		SHEET NO.:
											C406		131


TPSS CONDUIT RISER DETAILS

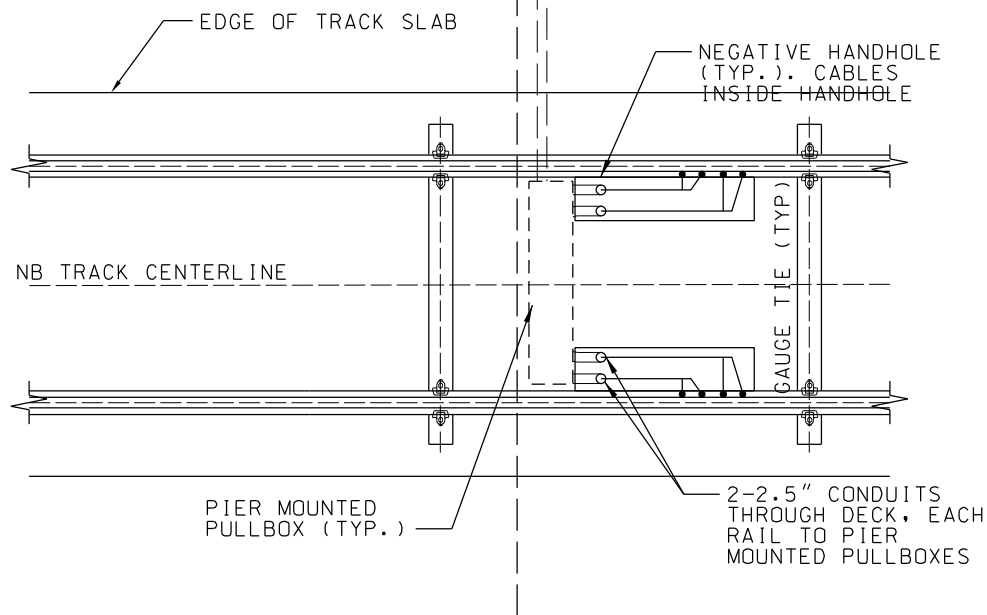
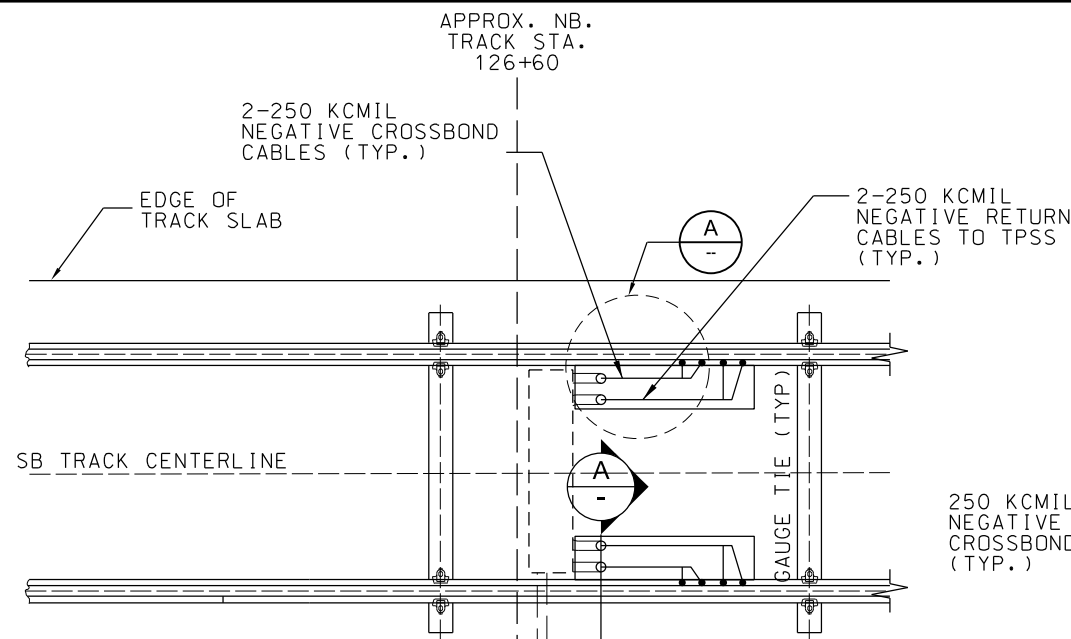




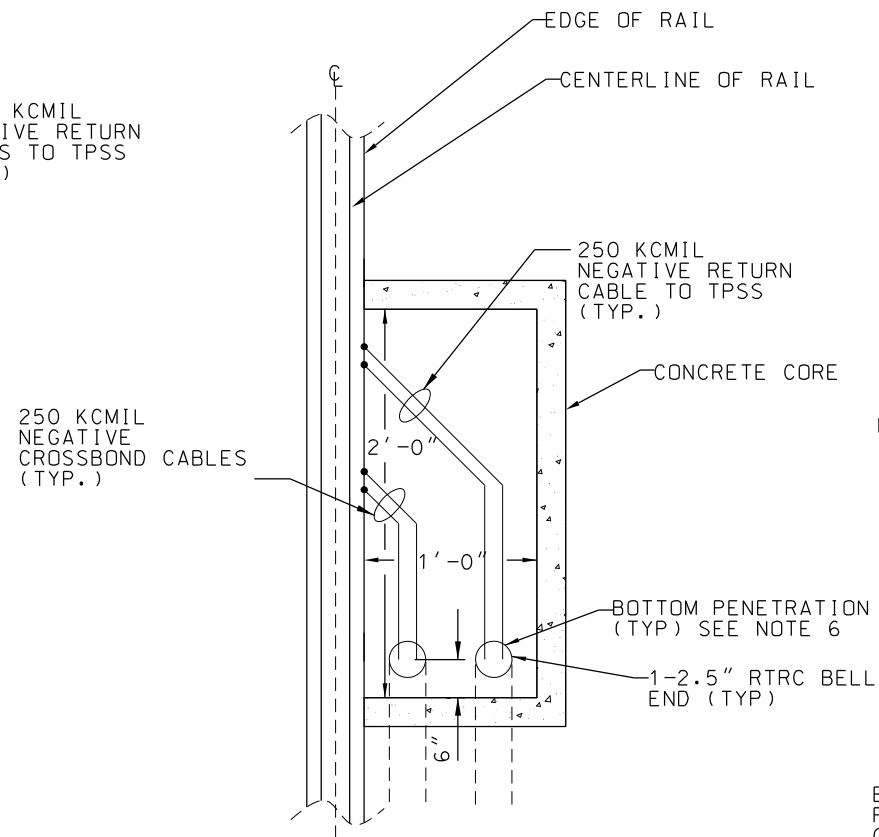


- NOTES**
1. REFER TO SPECIFICATION 26 05 44, SYSTEMWIDE ELECTRICAL MANHOLES AND HANDHOLES FOR SYSTEMS, FOR ADDITIONAL REQUIREMENTS.
  2. MANHOLES SHALL BE DESIGNED IN ACCORDANCE WITH HL-93 LOADING REQUIREMENTS OF AASHTO AND ASTM C857.
  3. COVER/RING/FRAE MATERIAL: CAST IRON, ASTM A48 CLASS 35B.
  4. ALL METALLIC COMPONENTS SHALL BE BONDED TOGETHER AND GROUNDED WITH A LOCAL GROUND ROD, AS SHOWN.
  5. CONTRACTOR TO SUBMIT SHOP DRAWINGS PER EACH LOCATION.

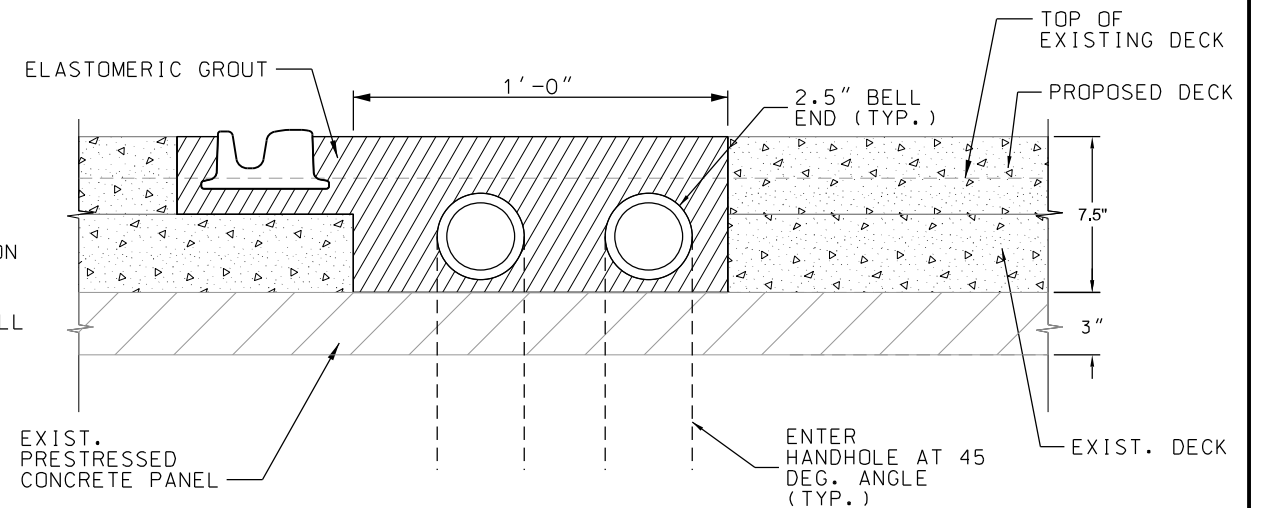
REV	DATE	DESCRIPTION	DESIGNED BY	AJC		<p>This set of plans is not for construction. These plans are intended to build interest in bidding the project.</p>	ISSUED FOR BID		DATE: 12-23-2022	KANSAS CITY STREETCAR - RIVERFRONT EXTENSION		SCALE FOR 22"x34": AS NOTED				
			CHECKED BY	CJH					<p>10450 Holmes Road Suite 600 Kansas City, MO 64131-3471 816-360-2700 Certificate of Authority: 000856</p>		TRACTION POWER SUBSTATION (TPSS) COMMUNICATIONS AND STRAY CURRENT PULLBOX TYPICAL DETAILS	FILENAME: C408.dgn				
			DRAWN BY	AJC			HDR Engineering, Inc.					CONTRACT NO.:				
			CHECKED BY	CJH			The HNTB Companies					CONTRACT NO. ***				
			APPROVED BY	CJH			Kansas City, MO 64105					VOLUME:				
							816-472-1201					DRAWING NO.:				
PLOT DATE: 12/22/2022			4:04:03 PM		DATE	12-23-2022	NOT FOR CONSTRUCTION					C408	SHEET NO.: 133			



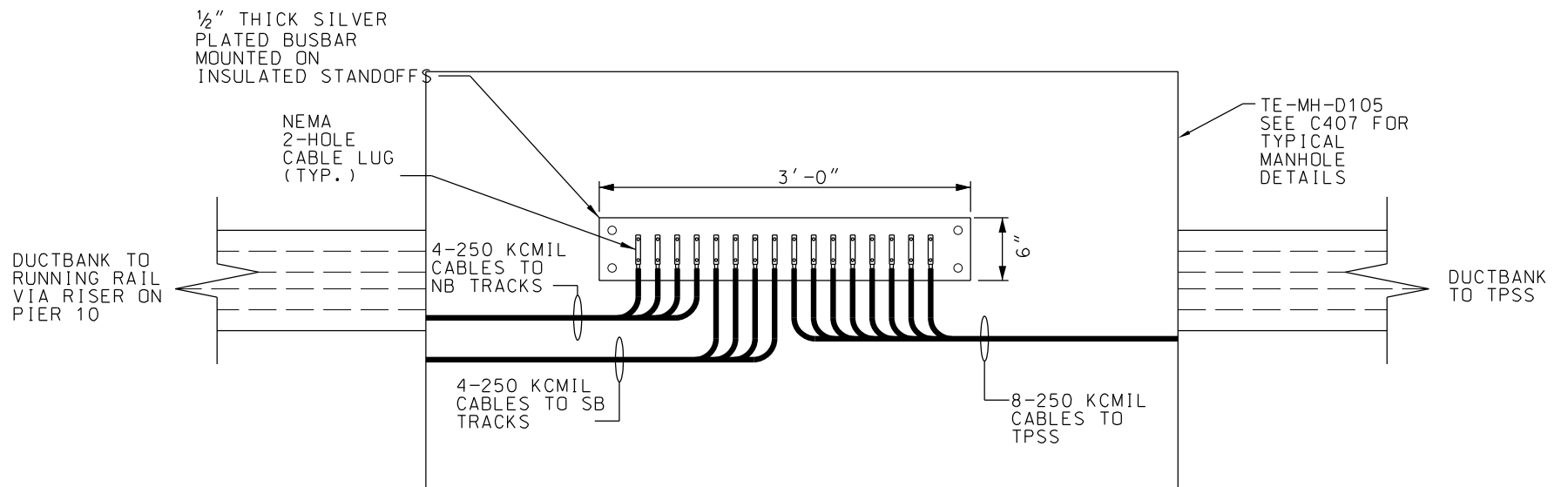
TRACK BLOCK OUT DETAIL 1  
SCALE: NTS



NEGATIVE RETURN HANDHOLE DETAIL TYPICAL A  
SCALE: NTS



SECTION A-A  
SCALE: NTS



NEGATIVE MANHOLE AND BUS BAR 2  
SCALE: NTS

NOTES:

1. BLOCKOUT FOR NEGATIVE RETURN MAY BE ON INSIDE OR OUTSIDE OF TRACKWAY.
2. EXOTHERMICALLY WELD NEGATIVE RETURN CABLES TO NEUTRAL AXIS ON WEB OF RAIL.
3. CONTRACTOR SHALL FILL THE BLOCKOUT WITH ELASTOMERIC GROUT AFTER CONNECTING THE NEGATIVE RETURN CABLES. DUCT SEAL CONDUITS BEFORE FILLING WITH GROUT. ALTERNATIVELY, CONTRACTOR MAY PROPOSE A SUITABLE HANDHOLE WITH AN AASHTO HL-93 TRAFFIC RATED COVER.
4. REFER TO C405 FOR NEGATIVE RETURN RISER DETAILS.
5. CONTRACTOR SHALL LOCATE PENETRATION HOLES TO AVOID EXISTING PRESTRESSED STRANDS IN EXISTING PRESTRESSED PANELS. (REF: C405)

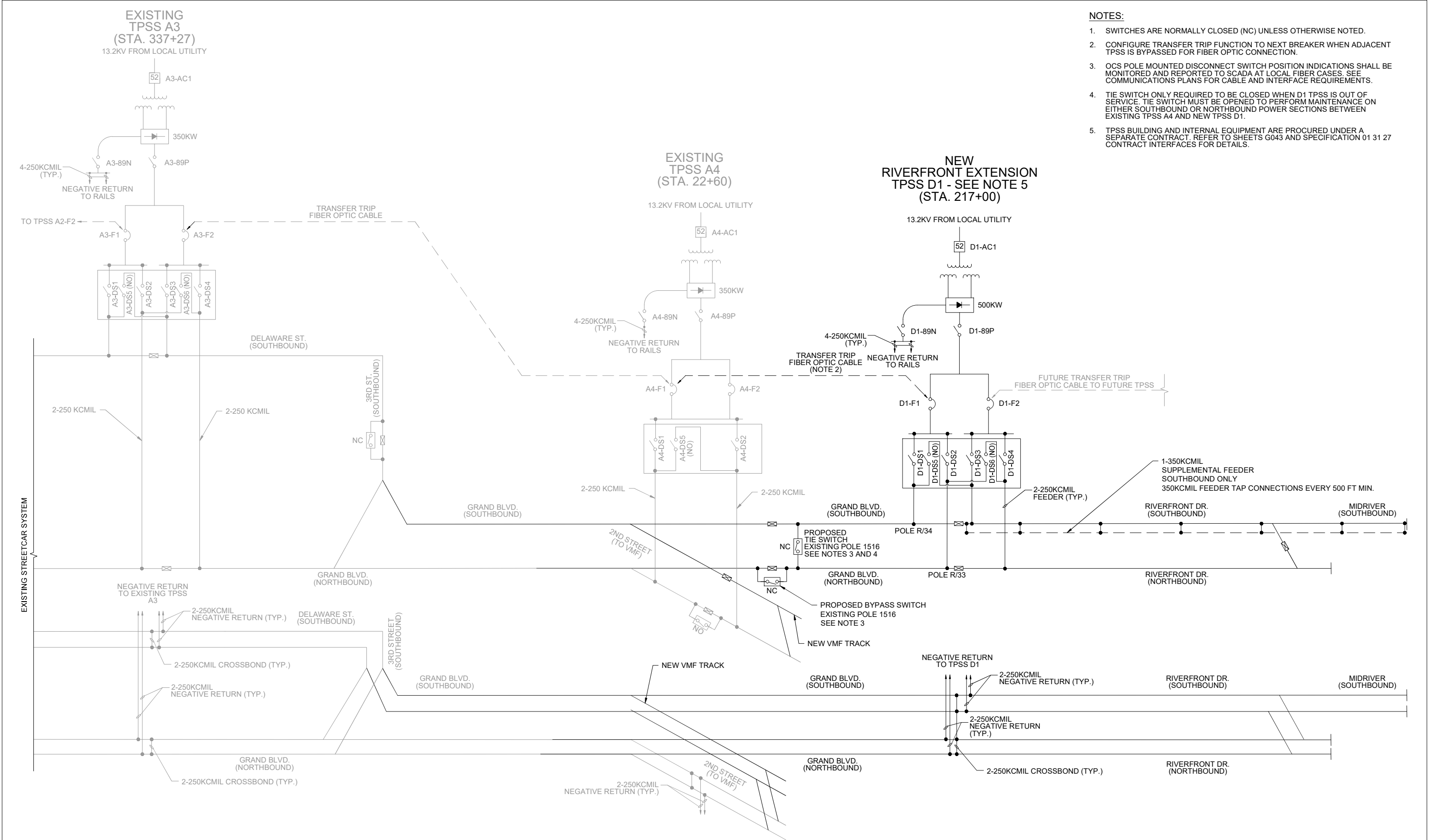
REV	DATE	DESCRIPTION	DESIGNED BY	AJC
			CHECKED BY	CJH
			DRAWN BY	AJC
			CHECKED BY	CJH
			APPROVED BY	CJH
PLOT DATE: 12/22/2022			DATE	12-23-2022



This set of plans is not for construction. These plans are intended to build interest in bidding the project.

ISSUED FOR BID	DATE: 12-23-2022
<b>HDR</b> HDR Engineering, Inc. 10450 Holmes Road Suite 600 Kansas City, MO 64131-3471 816-360-2700 Certificate of Authority: 000856	<b>HNTB</b> The HNTB Companies 715 Kirk Drive Kansas City, MO 64105 816-472-1201 Certificate of Authority: 001270
NOT FOR CONSTRUCTION	

KANSAS CITY STREETCAR - RIVERFRONT EXTENSION		SCALE FOR 22"x34": AS NOTED
TRACTION POWER SUBSTATION (TPSS)		FILENAME: C409.dgn
TYPICAL NEGATIVE RETURN TRACK BLOCKOUT		CONTRACT NO.: CONTRACT NO. ***
AND TYPICAL CONDUIT STUB-UP DETAIL		VOLUME: 1
DRAWING NO.: C409	SHEET NO.: 134	



- NOTES:**
1. SWITCHES ARE NORMALLY CLOSED (NC) UNLESS OTHERWISE NOTED.
  2. CONFIGURE TRANSFER TRIP FUNCTION TO NEXT BREAKER WHEN ADJACENT TPSS IS BYPASSED FOR FIBER OPTIC CONNECTION.
  3. OCS POLE MOUNTED DISCONNECT SWITCH POSITION INDICATIONS SHALL BE MONITORED AND REPORTED TO SCADA AT LOCAL FIBER CASES. SEE COMMUNICATIONS PLANS FOR CABLE AND INTERFACE REQUIREMENTS.
  4. TIE SWITCH ONLY REQUIRED TO BE CLOSED WHEN D1 TPSS IS OUT OF SERVICE. TIE SWITCH MUST BE OPENED TO PERFORM MAINTENANCE ON EITHER SOUTHBOUND OR NORTHBOUND POWER SECTIONS BETWEEN EXISTING TPSS A4 AND NEW TPSS D1.
  5. TPSS BUILDING AND INTERNAL EQUIPMENT ARE PROCURED UNDER A SEPARATE CONTRACT. REFER TO SHEETS G043 AND SPECIFICATION 01 31 27 CONTRACT INTERFACES FOR DETAILS.

REV	DATE	DESCRIPTION	DESIGNED BY	JDW			<div>ISSUED FOR BID</div> <div> HDR Engineering, Inc.</div> <div> The HNTB COMPANIES INFRASTRUCTURE SOLUTIONS</div> <div>10450 Holmes Road Suite 600 Kansas City, MO 64131-3471 816-360-2700 Certificate of Authority: 000856</div> <div> Certificate of Authority: 001270</div>	DATE: <b>12-23-2022</b>	<b>KANSAS CITY STREETCAR - RIVERFRONT EXTENSION</b>	<div>TRACTION POWER SYSTEM MASTER SINGLE LINE DIAGRAM RIVERFRONT EXTENSION</div>	SCALE FOR 22"x34": NOT TO SCALE FILENAME: J101.DWG CONTRACT NO.: CONTRACT NO. ### VOLUME: 1 DRAWING NO.: SHEET NO.:	
			CHECKED BY	PGL								NOT FOR CONSTRUCTION
			DRAWN BY	JDW								
			CHECKED BY	PGL								
			APPROVED BY	NKS								
PLOT DATE: 12/20/2022			12:09:47 PM		DATE	12/23/2022	<div>J101</div> <div>135</div>					

AC LOCKOUT (86) IS ACTIVATED BY THE FOLLOWING DEVICES:

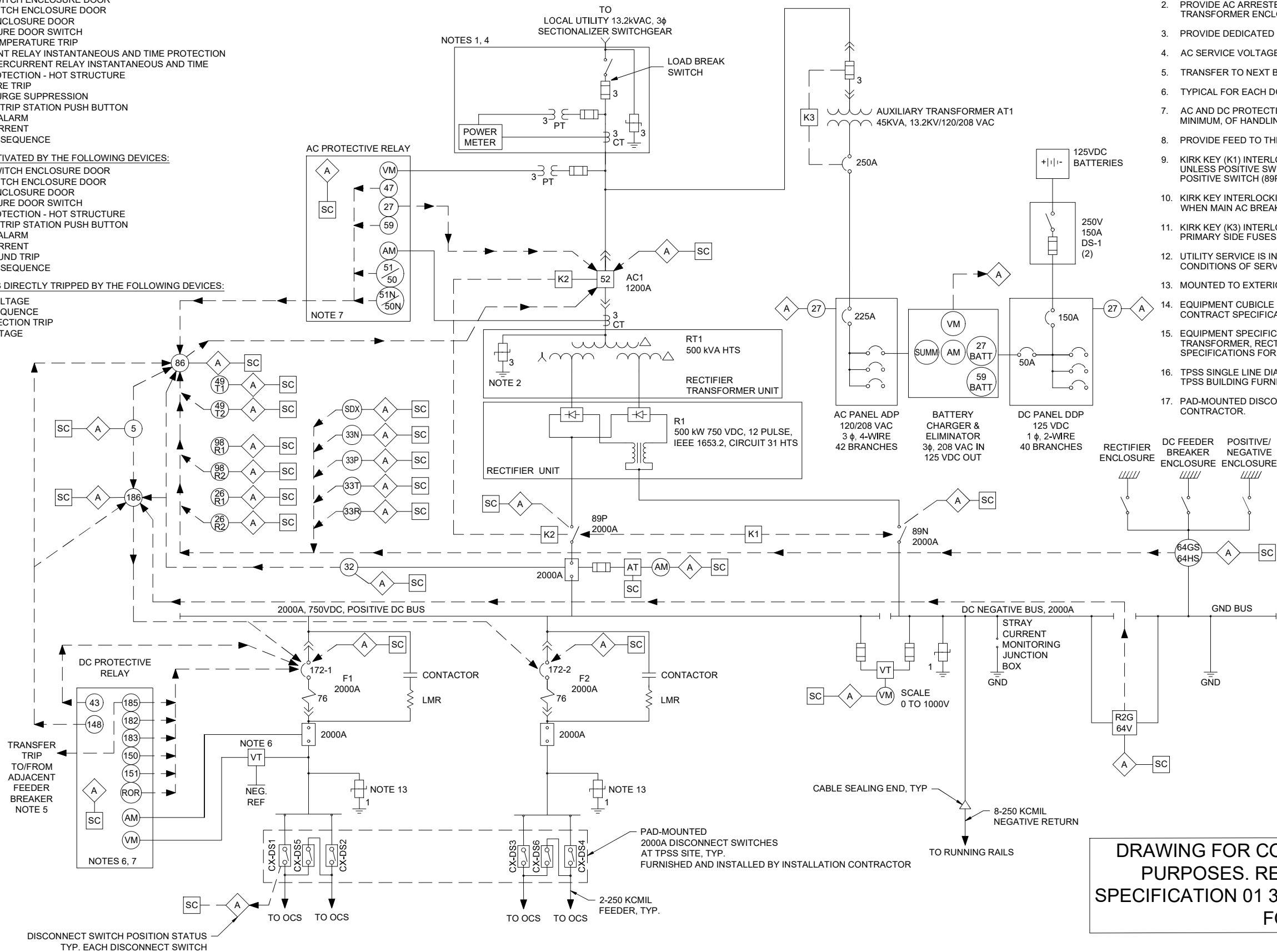
26-R2	RECTIFIER DIODE OVER TEMP TRIP
33A-X	MAIN AC BREAKER CUBICLE REAR DOOR
33F-X	DC FEEDER BREAKER CUBICLE REAR DOOR
33N-X	NEGATIVE SWITCH ENCLOSURE DOOR
33P-X	POSITIVE SWITCH ENCLOSURE DOOR
33R-X	RECTIFIER ENCLOSURE DOOR
33T-X	TPT ENCLOSURE DOOR SWITCH
49-WT2	TPT OVER TEMPERATURE TRIP
50/51	OVERCURRENT RELAY INSTANTANEOUS AND TIME PROTECTION
50N/51N	NEUTRAL OVERCURRENT RELAY INSTANTANEOUS AND TIME
64HS	GROUND PROTECTION - HOT STRUCTURE
98R2	DIODE FAILURE TRIP
99T	RECTIFIER SURGE SUPPRESSION
5	EMERGENCY TRIP STATION PUSH BUTTON
SDX	FIRE/SMOKE ALARM
32	REVERSE CURRENT
148	INCOMPLETE SEQUENCE

DC LOCKOUT (186) IS ACTIVATED BY THE FOLLOWING DEVICES:

33N-X	NEGATIVE SWITCH ENCLOSURE DOOR
33P-X	POSITIVE SWITCH ENCLOSURE DOOR
33R-X	RECTIFIER ENCLOSURE DOOR
33T-X	TPT ENCLOSURE DOOR SWITCH
64HS	GROUND PROTECTION - HOT STRUCTURE
5	EMERGENCY TRIP STATION PUSH BUTTON
SDX	FIRE/SMOKE ALARM
32	REVERSE CURRENT
R2G	RAIL TO GROUND TRIP
148	INCOMPLETE SEQUENCE

AC MAIN BREAKER (52) IS DIRECTLY TRIPPED BY THE FOLLOWING DEVICES:

27	AC UNDERVOLTAGE
47	AC PHASE SEQUENCE
50/51	RELAY PROTECTION TRIP
59	AC OVERVOLTAGE



NOTES:

1. UTILITY METERING INSTRUMENT TRANSFORMERS AND METER PROVIDED BY LOCAL UTILITY.
2. PROVIDE AC ARRESTER IN A SEPARATE ENCLOSURE WITH BARRIER WITHIN TRANSFORMER ENCLOSURE.
3. PROVIDE DEDICATED 120V AC CIRCUIT FOR TPSS BUILDING EXTERIOR RECEPTACLES.
4. AC SERVICE VOLTAGE FOR ALL SUBSTATIONS IS 13.2KV, 3-PHASE.
5. TRANSFER TO NEXT BREAKER WHEN ADJACENT TPSS IS IN BYPASS.
6. TYPICAL FOR EACH DC FEEDER BREAKER
7. AC AND DC PROTECTIVE RELAYS SHALL BE MULTIFUNCTION AND CAPABLE, AT A MINIMUM, OF HANDLING ALL FUNCTIONS SHOWN.
8. PROVIDE FEED TO THE BATTERY CHARGER AND OTHER BUILDING AUXILIARY LOADS.
9. KIRK KEY (K1) INTERLOCK WILL PREVENT OPENING OF 89N NEGATIVE DISCONNECT UNLESS POSITIVE SWITCH (89P) IS DISCONNECTED AND SHALL PREVENT CLOSE OF THE POSITIVE SWITCH (89P) UNLESS THE 89N NEGATIVE DISCONNECT IS CLOSED.
10. KIRK KEY INTERLOCKING (K2) WILL PREVENT OPENING OF THE POSITIVE SWITCH (89P) WHEN MAIN AC BREAKER IS CLOSED AND RACKED IN.
11. KIRK KEY (K3) INTERLOCK WILL PREVENT REMOVAL OF AUXILIARY TRANSFORMER AT 1 PRIMARY SIDE FUSES UNLESS SECONDARY (250A) CB IS OPEN.
12. UTILITY SERVICE IS IN ACCORDANCE WITH LOCAL UTILITY REQUIREMENTS AND CONDITIONS OF SERVICE.
13. MOUNTED TO EXTERIOR OF TPSS.
14. EQUIPMENT CUBICLE LIGHTING AND HEATING TO BE PROPOSED BY VENDOR. SEE CONTRACT SPECIFICATIONS FOR DETAILED REQUIREMENTS.
15. EQUIPMENT SPECIFIC SCHEMATICS (AC SWITCHGEAR, DC SWITCHGEAR, RECTIFIER TRANSFORMER, RECTIFIER, ETC.) SHALL BE PROPOSED BY VENDOR. SEE CONTRACT SPECIFICATIONS FOR DETAILED REQUIREMENTS.
16. TPSS SINGLE LINE DIAGRAM PROVIDED FOR COORDINATION PURPOSES BETWEEN THE TPSS BUILDING FURNISHED BY THE OWNER AND THE INSTALLATION CONTRACTOR.
17. PAD-MOUNTED DISCONNECT SWITCHES FURNISHED AND INSTALLED BY THE CONTRACTOR.

DRAWING FOR CONTRACTOR COORDINATION  
PURPOSES. REFER TO SHEET G043 AND  
SPECIFICATION 01 31 27 - CONTRACT INTERFACES  
FOR DETAILS.

REV	DATE	DESCRIPTION	DESIGNED BY	JDW
			CHECKED BY	PGL
			DRAWN BY	JDW
			CHECKED BY	PGL
			APPROVED BY	NKS
PLOT DATE: 12/21/2022			5:10:00 PM	DATE 12/23/2022



This set of plans is not for construction. These plans are intended to build interest in bidding the project.

ISSUED FOR BID



**HDR** HDR Engineering, Inc.  
10450 Holmes Road  
Suite 600  
Kansas City, MO 64131-3471  
816-360-2700  
Certificate of Authority: 000856

DATE: 12-23-2022



The HNTB COMPANIES  
INFRASTRUCTURE SOLUTIONS  
300 Apollo Drive  
Chelmsford, MA 01824  
Phone: 978-905-4000  
Certificate of Authority: 001270

## 2 KANSAS CITY STREETCAR - RIVERFRONT EXTENSION

TRACTION POWER  
TYPICAL MAINLINE TPSS SINGLE LINE  
SINGLE LINE DIAGRAM

SCALE FOR 22"x34":

NOT TO SCALE  
FILENAME:

J610.DWG

CONTRACT NO.:

CONTRACT NO. ###

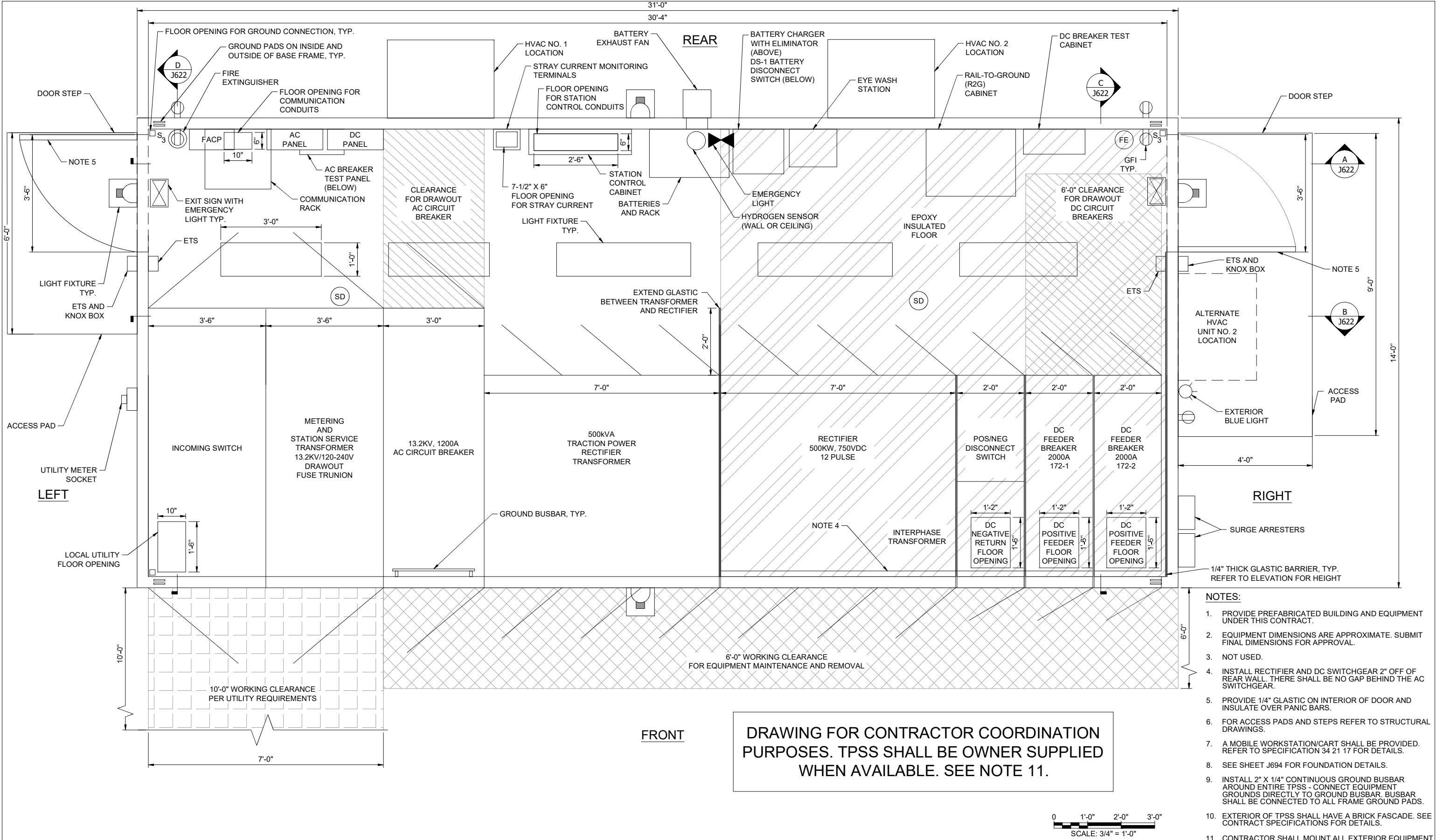
VOLUME:  
1

DRAWING NO.:	SHEET NO.
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1610	136
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5610	130
------	-----





DRAWING FOR CONTRACTOR COORDINATION PURPOSES. TPSS SHALL BE OWNER SUPPLIED WHEN AVAILABLE. SEE NOTE 11.

- NOTES:
- 1. PROVIDE PREFABRICATED BUILDING AND EQUIPMENT UNDER THIS CONTRACT.
  - 2. EQUIPMENT DIMENSIONS ARE APPROXIMATE. SUBMIT FINAL DIMENSIONS FOR APPROVAL.
  - 3. NOT USED.
  - 4. INSTALL RECTIFIER AND DC SWITCHGEAR 2" OFF OF REAR WALL. THERE SHALL BE NO GAP BEHIND THE AC SWITCHGEAR.
  - 5. PROVIDE 1/4" GLASTIC ON INTERIOR OF DOOR AND INSULATE OVER PANIC BARS.
  - 6. FOR ACCESS PADS AND STEPS REFER TO STRUCTURAL DRAWINGS.
  - 7. A MOBILE WORKSTATION/CART SHALL BE PROVIDED. REFER TO SPECIFICATION 34 21 17 FOR DETAILS.
  - 8. SEE SHEET J694 FOR FOUNDATION DETAILS.
  - 9. INSTALL 2" X 1/4" CONTINUOUS GROUND BUSBAR AROUND ENTIRE TPSS - CONNECT EQUIPMENT GROUNDS DIRECTLY TO GROUND BUSBAR. BUSBAR SHALL BE CONNECTED TO ALL FRAME GROUND PADS.
  - 10. EXTERIOR OF TPSS SHALL HAVE A BRICK FASCIADE. SEE CONTRACT SPECIFICATIONS FOR DETAILS.
  - 11. CONTRACTOR SHALL MOUNT ALL EXTERIOR EQUIPMENT PER SUPPLIER INSTRUCTIONS.

REV	DATE	DESCRIPTION	DESIGNED BY	JDW
			CHECKED BY	PGL
			DRAWN BY	JDW
			CHECKED BY	PGL
			APPROVED BY	NKS
PLOT DATE: 12/21/2022			DATE	12/23/2022



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DATE: 12-23-2022

HDR Engineering, Inc.  
10450 Holmes Road  
Suite 600  
Kansas City, MO 64131-3471  
816-360-2700  
Certificate of Authority: 000856

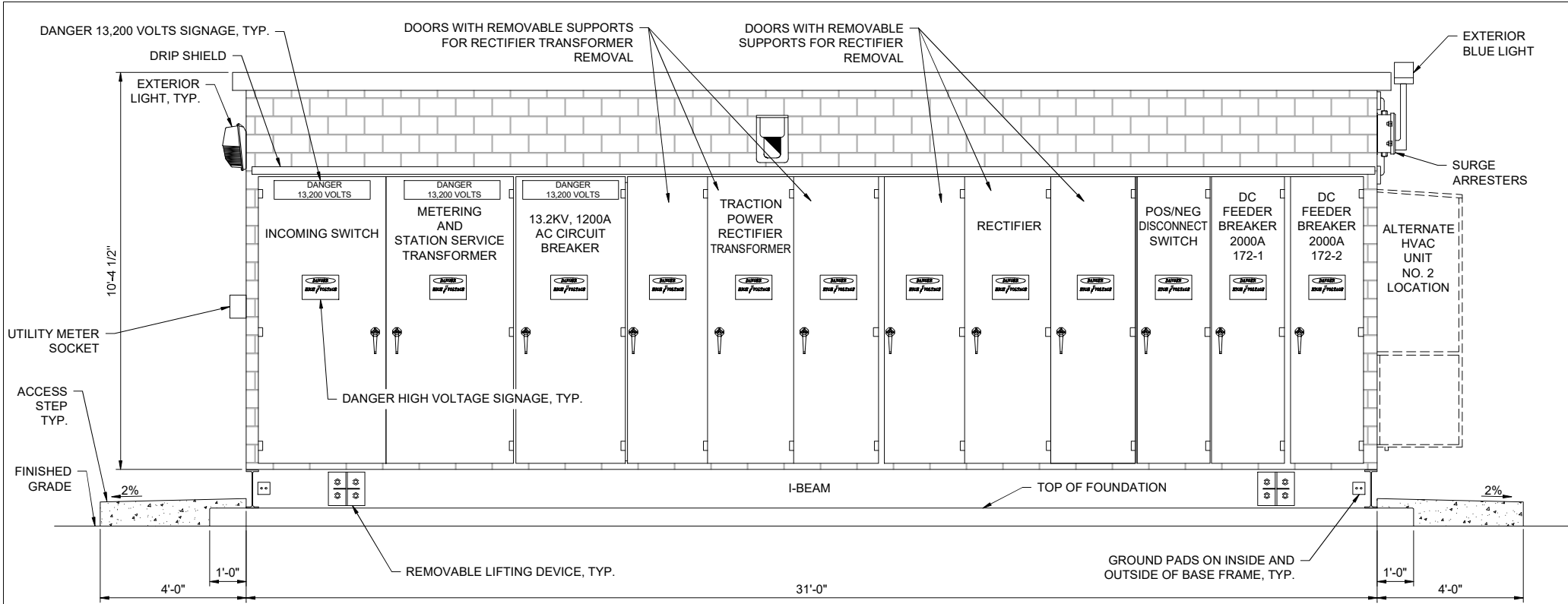
The HNTB COMPANIES  
INFRASTRUCTURE SOLUTIONS  
300 Apollo Drive  
Chelmsford, MA 01824  
Phone: 978-905-4000  
Certificate of Authority: 001270

NOT FOR CONSTRUCTION

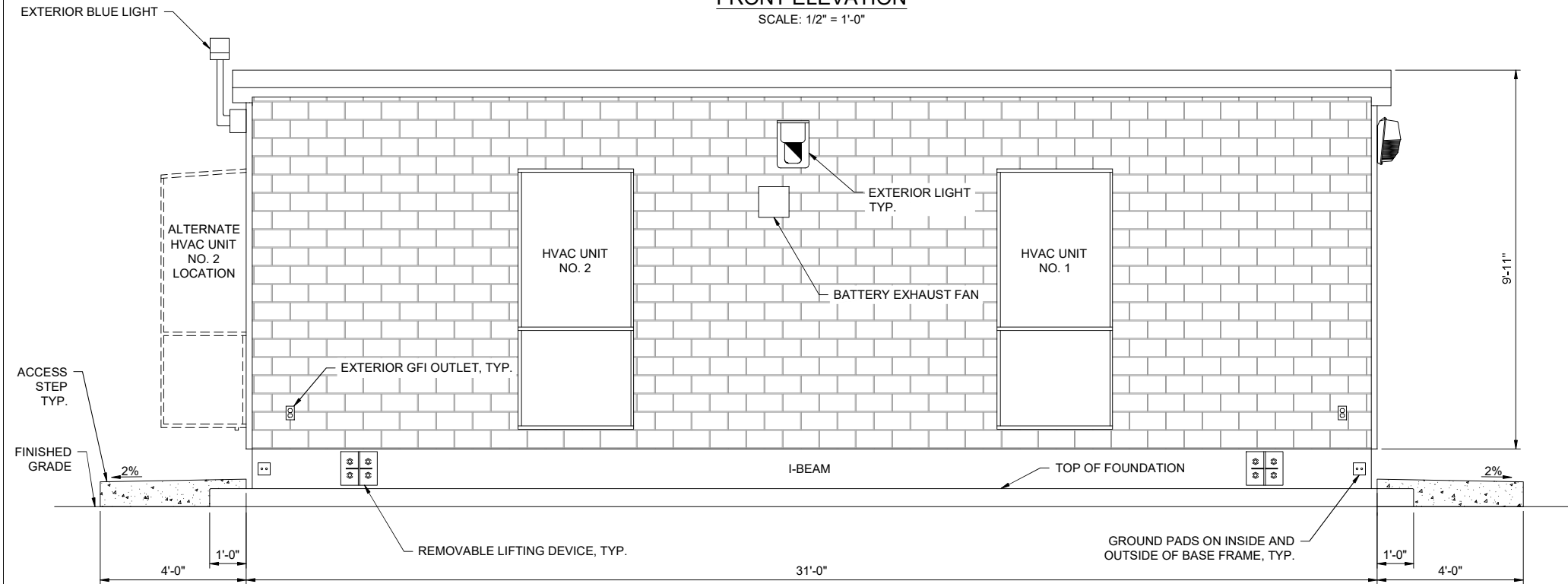
KANSAS CITY STREETCAR - RIVERFRONT EXTENSION

TRACTION POWER  
TYPICAL PREFABRICATED TPSS PLAN  
EQUIPMENT LAYOUT PLAN

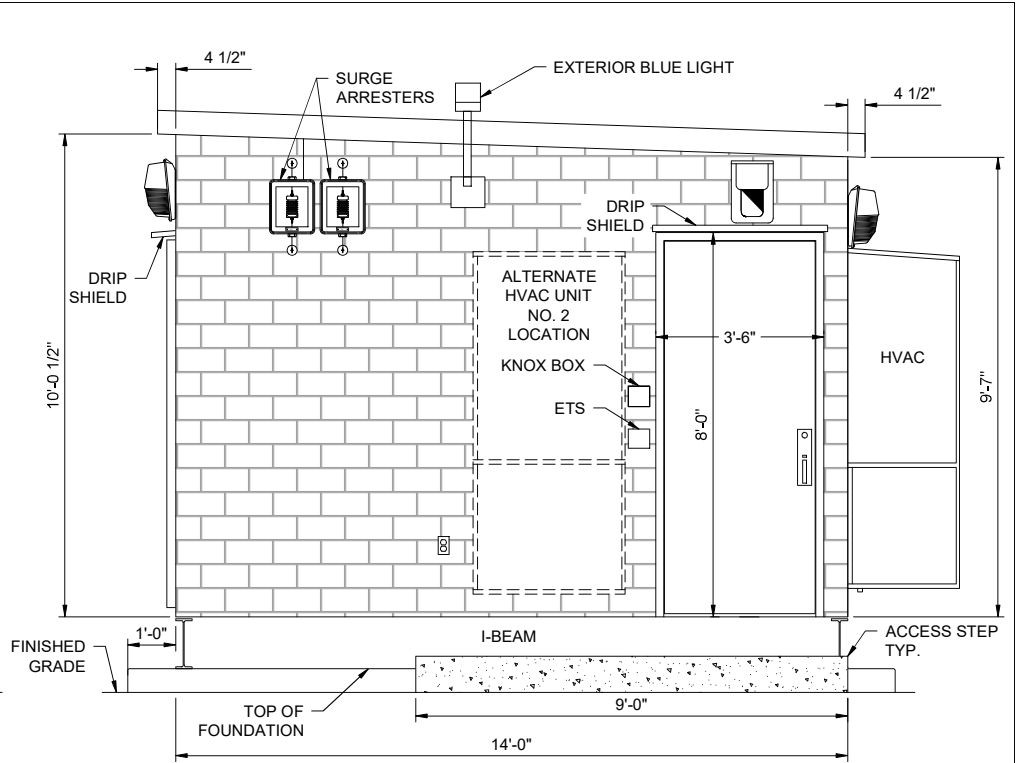
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FILENAME:  
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CONTRACT NO.:  
CONTRACT NO. ###  
VOLUME:  
1  
DRAWING NO.: J620  
SHEET NO.: 137



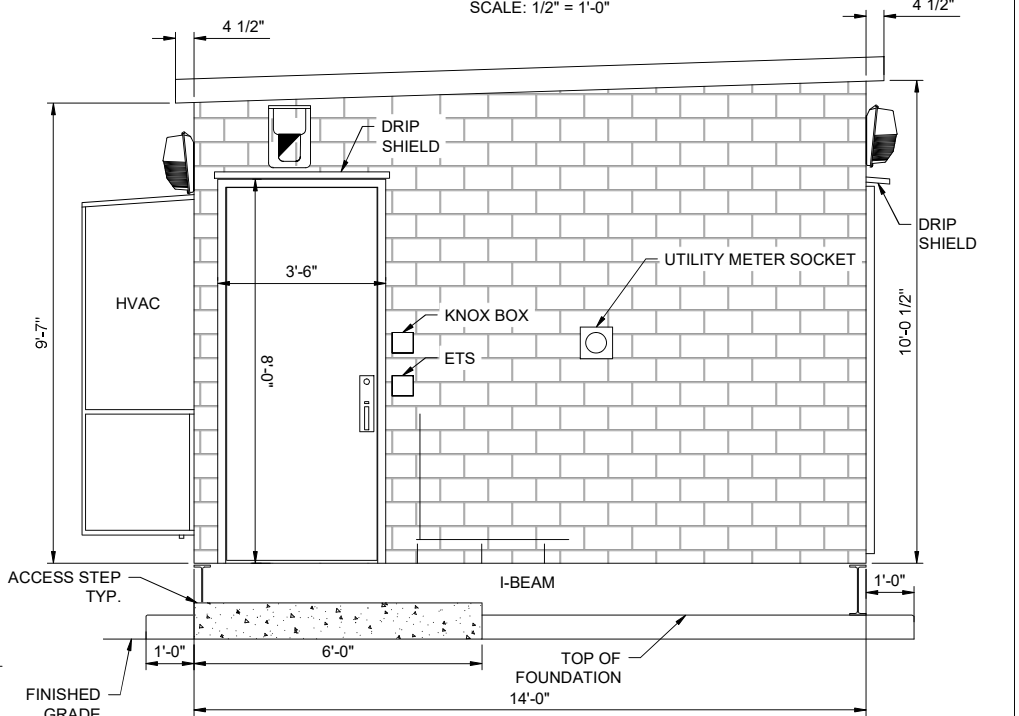
FRONT ELEVATION  
SCALE: 1/2" = 1'-0"



REAR ELEVATION  
SCALE: 1/2" = 1'-0"



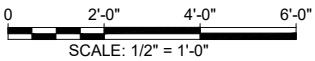
RIGHT ELEVATION  
SCALE: 1/2" = 1'-0"



LEFT ELEVATION  
SCALE: 1/2" = 1'-0"

- NOTES:
- EQUIPMENT DIMENSIONS ARE APPROXIMATE. SUBMIT FINAL DIMENSIONS FOR APPROVAL.
  - NOT USED.
  - SEE SHEET J694 FOR FOUNDATION DETAILS.
  - METERING EQUIPMENT AND SOCKET DETAILS SUBJECT TO APPROVAL OF UTILITY.
  - VENDOR SHALL SIZE EXTERIOR EQUIPMENT DOORS AND SUPPORTS FOR RECTIFIER AND TRANSFORMER TO ALLOW FOR REMOVAL FROM OUTSIDE THE TPSS.
  - EXTERIOR OF TPSS SHALL HAVE A BRICK FASCAD. SEE CONTRACT SPECIFICATIONS FOR DETAILS.
  - CONTRACTOR SHALL MOUNT ALL EXTERIOR EQUIPMENT PER SUPPLIER INSTRUCTIONS.

DRAWING FOR CONTRACTOR COORDINATION PURPOSES. TPSS SHALL BE OWNER SUPPLIED WHEN AVAILABLE. SEE NOTE 7.



REV	DATE	DESCRIPTION	DESIGNED BY	JDW
			CHECKED BY	PGL
			DRAWN BY	JDW
			CHECKED BY	PGL
			APPROVED BY	NKS
PLOT DATE: 12/21/2022			DATE	12/23/2022



This set of plans is not for construction. These plans are intended to build interest in bidding the project.

ISSUED FOR BID

DATE: 12-23-2022

**HNTB**

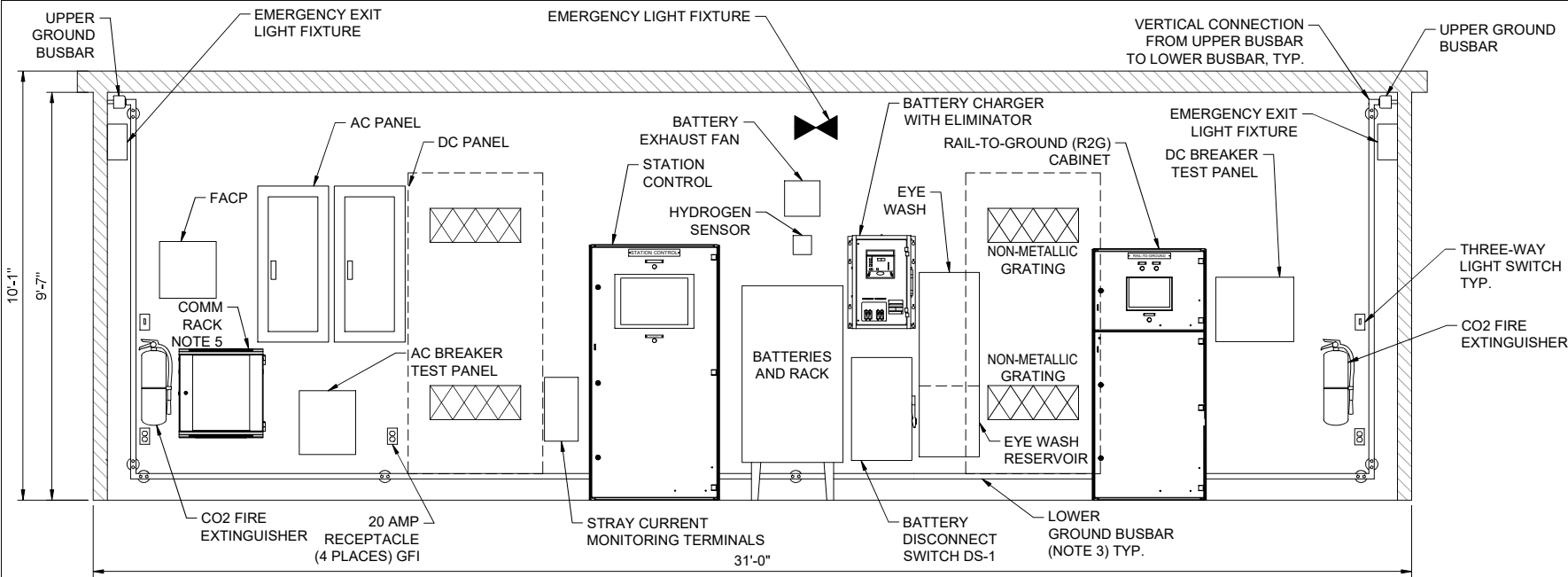
The HNTB COMPANIES  
INFRASTRUCTURE SOLUTIONS  
10450 Holmes Road  
Suite 600  
Kansas City, MO 64131-3471  
816-360-2700  
Certificate of Authority: 000856

NOT FOR CONSTRUCTION

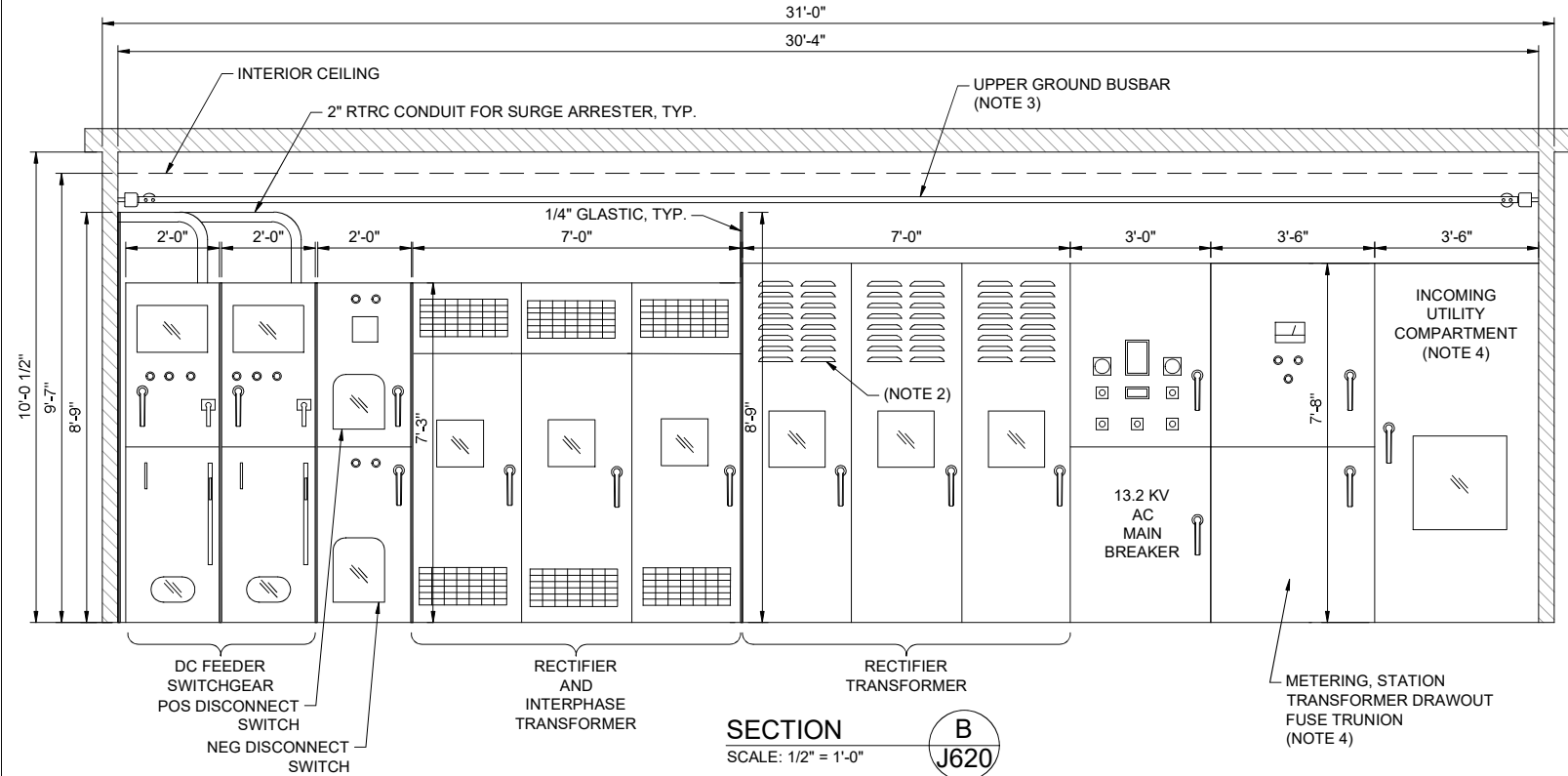
**KANSAS CITY STREETCAR - RIVERFRONT EXTENSION**

TRACTION POWER  
TYPICAL PREFABRICATED TPSS - EXTERIOR ELEVATIONS  
ELEVATION VIEW

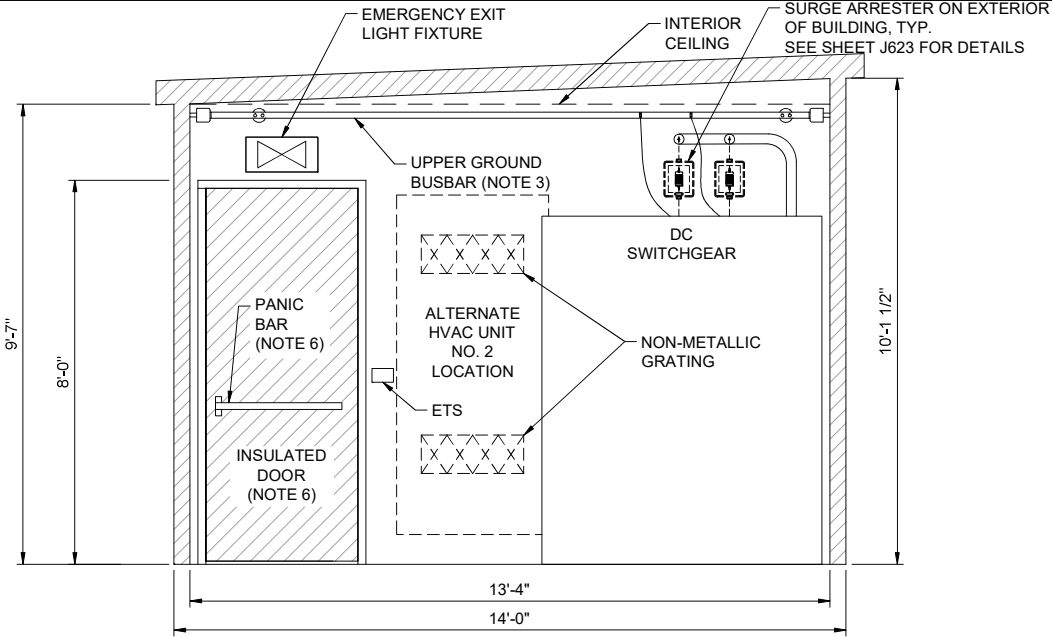
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FILENAME:  
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CONTRACT NO.:  
CONTRACT NO. ###  
VOLUME:  
1  
DRAWING NO.: J621  
SHEET NO.: 138



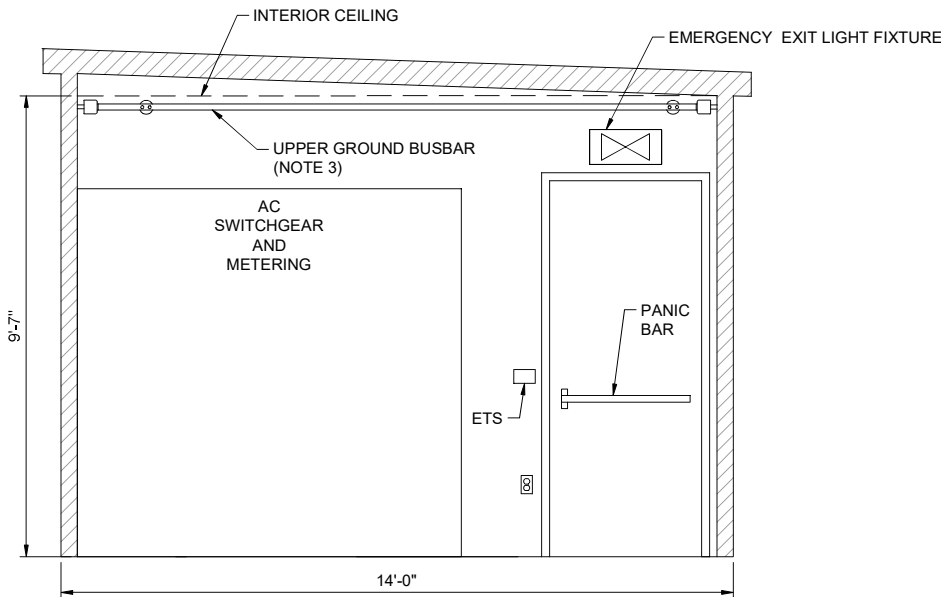
SECTION A  
SCALE: 1/2" = 1'-0"  
J620



SECTION B  
SCALE: 1/2" = 1'-0"  
J620

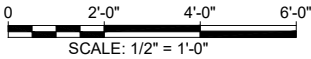


SECTION C  
SCALE: 1/2" = 1'-0"  
J620



SECTION D  
SCALE: 1/2" = 1'-0"  
J620

- NOTES:
- ALL DIMENSIONS ARE APPROXIMATE. SUBMIT FINAL DIMENSIONS FOR APPROVAL.
  - CONTRACTOR TO DETERMINE SIZE AND LOCATION OF TRANSFORMER AND RECTIFIER VENTILATION.
  - INSTALL 2" x 1/4" CONTINUOUS GROUND BUSBAR AROUND ENTIRE TPSS - CONNECT EQUIPMENT GROUNDS DIRECTLY TO GROUND BUSBAR.
  - INCOMING SWITCH, METERING EQUIPMENT, AND SOCKET DETAILS SUBJECT TO APPROVAL OF UTILITY.
  - REFER TO SPECIFICATIONS FOR COMMUNICATIONS RACK REQUIREMENTS.
  - PROVIDE 1/4" GLASTIC ON INTERIOR OF DOOR AND INSULATE OVER PANIC BARS.
  - INSTALL RECTIFIER AND DC SWITCHGEAR 2" OFF OF REAR WALL. THERE SHALL BE NO GAP BEHIND THE AC SWITCHGEAR.
  - CONTRACTOR SHALL MOUNT ALL EXTERIOR EQUIPMENT PER SUPPLIER INSTRUCTIONS.
  - A MOBILE WORKSTATION/CART SHALL BE PROVIDED. REFER TO SPECIFICATION 34 21 17 FOR DETAILS.



DRAWING FOR CONTRACTOR COORDINATION PURPOSES. TPSS SHALL BE OWNER SUPPLIED WHEN AVAILABLE. SEE NOTE 8.

REV	DATE	DESCRIPTION	DESIGNED BY	JDW
			CHECKED BY	PGL
			DRAWN BY	JDW
			CHECKED BY	PGL
			APPROVED BY	NKS
PLOT DATE: 12/21/2022			DATE	12/23/2022



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ISSUED FOR BID DATE: 12-23-2022

**HDR** HDR Engineering, Inc.  
10450 Holmes Road  
Suite 600  
Kansas City, MO 64131-3471  
816-360-2700  
Certificate of Authority: 000856

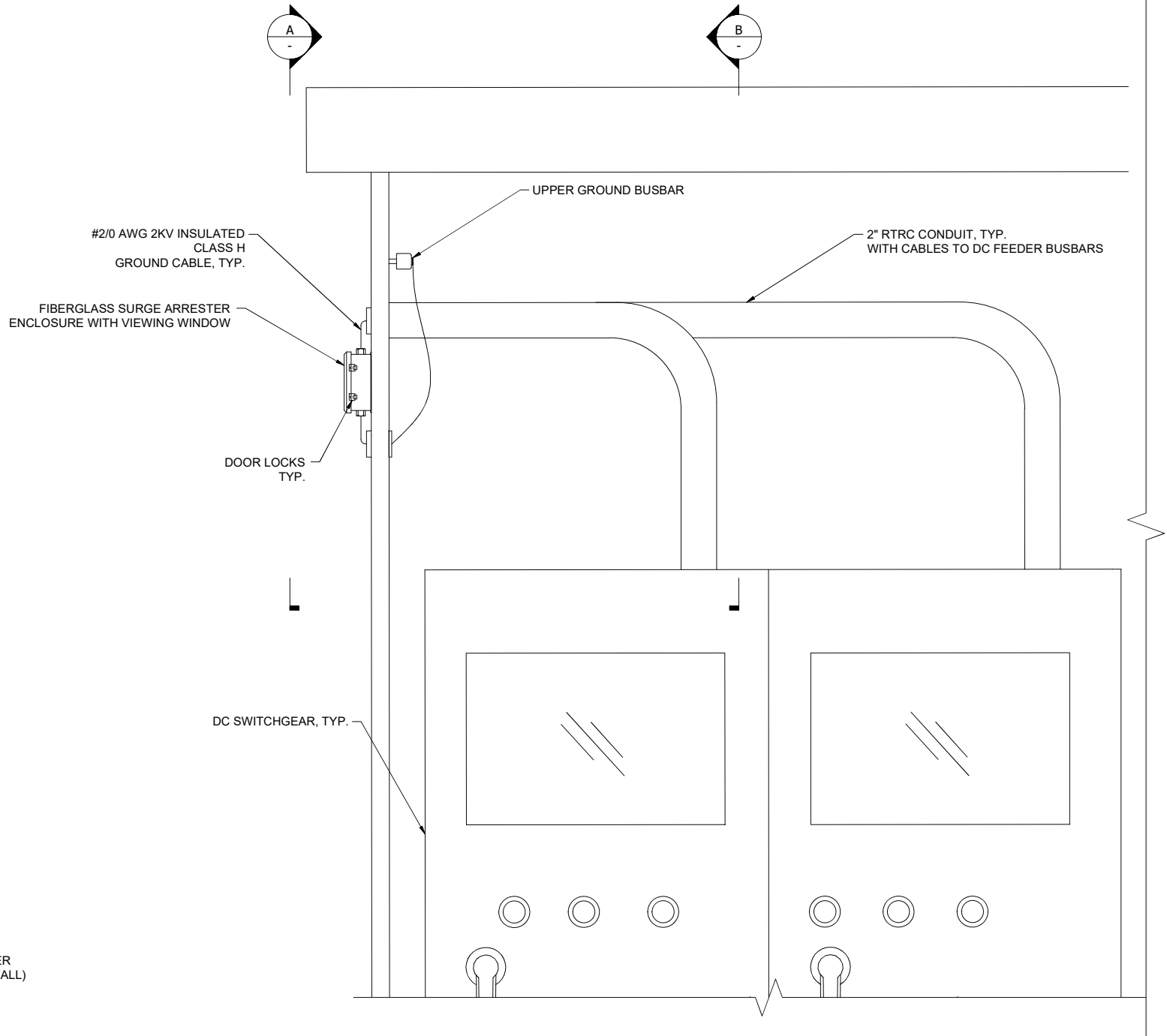
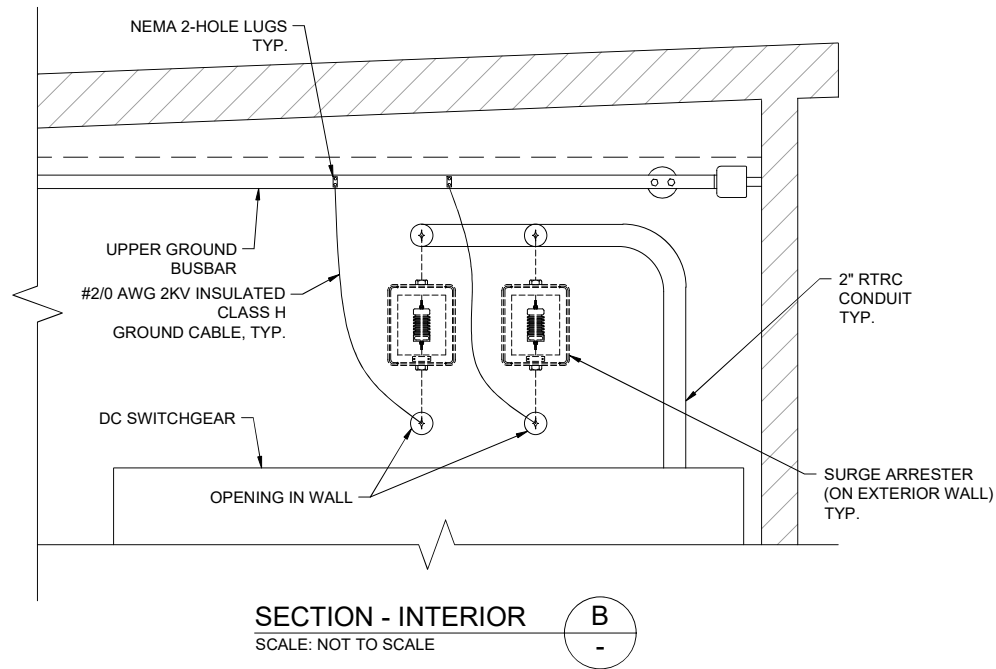
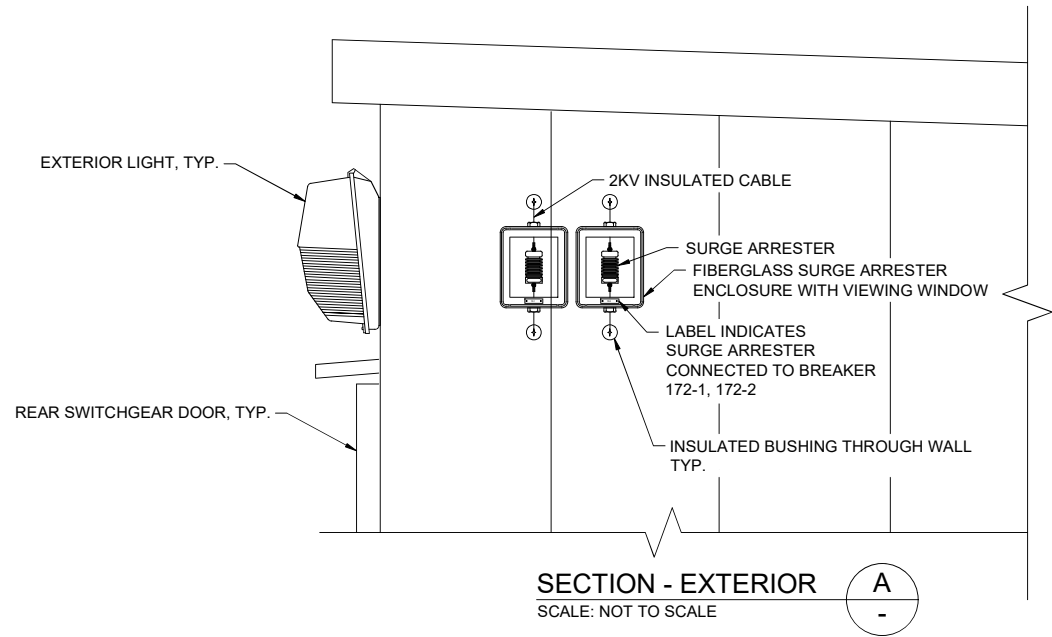
**HNTB** The HNTB COMPANIES  
INFRASTRUCTURE SOLUTIONS  
300 Apollo Drive  
Chelmsford, MA 01824  
Phone: 978-905-4000  
Certificate of Authority: 001270

NOT FOR CONSTRUCTION

KANSAS CITY STREETCAR - RIVERFRONT EXTENSION

TRACTION POWER  
TYPICAL PREFABRICATED TPSS INTERIOR ELEVATIONS  
INTERIOR ELEVATIONS

SCALE FOR 22"x34": 1/2"=1'-0"	FILENAME: J620-J623.DWG
CONTRACT NO.: CONTRACT NO. ###	VOLUME: 1
DRAWING NO.: J622	SHEET NO.: 139

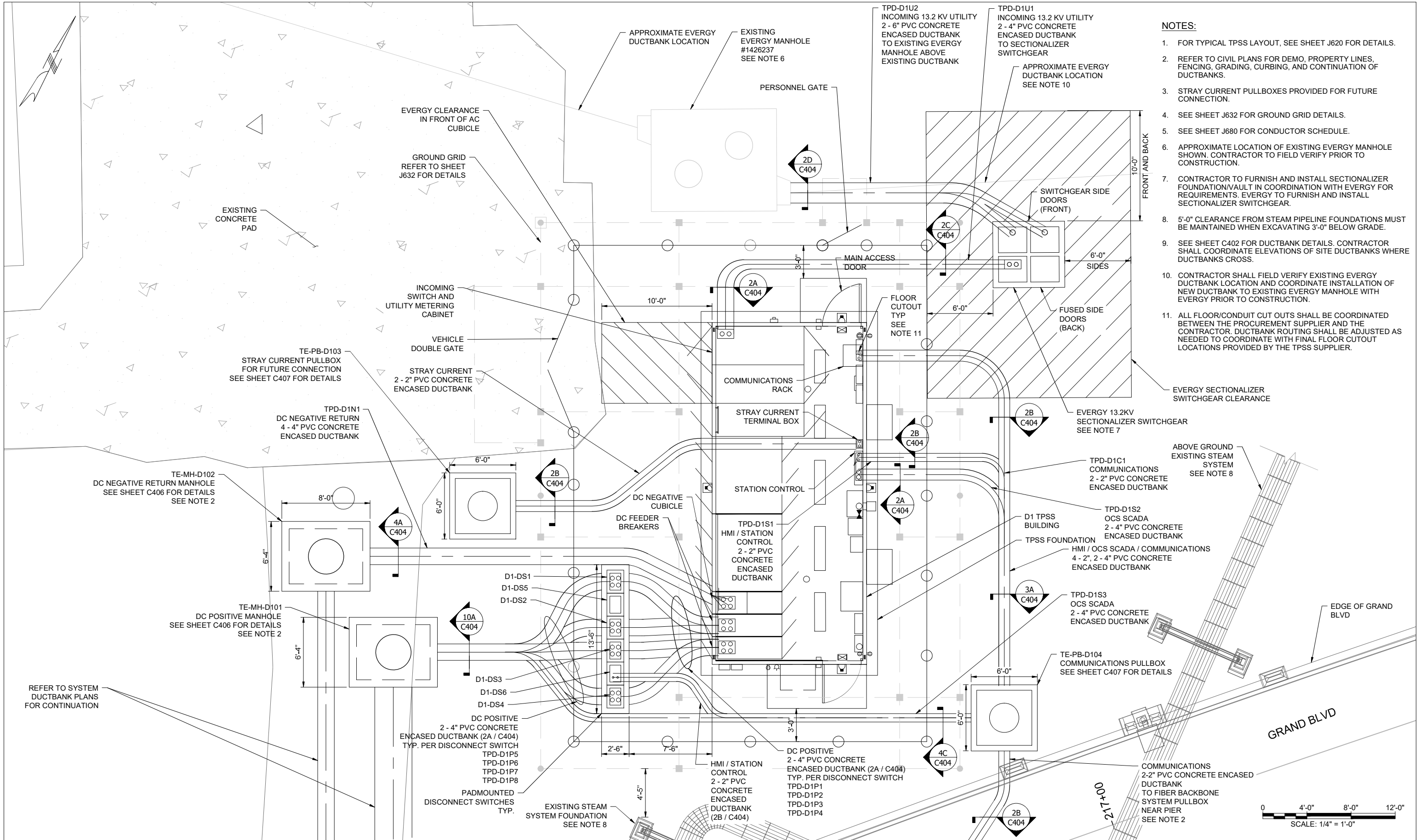


- NOTES:
1. SECURE CABLES ALONG THE BRACKET.
  2. PROVIDE ENOUGH SLACK IN CABLE FOR SURGE ARRESTER TO FALL AWAY FROM BRACKET.
  3. PROVIDE FIBERGLASS ENCLOSURE WITH VIEWING WINDOW AND DOOR LOCKS.
  4. SURGE ARRESTERS SHALL BE MOUNTED AT A MINIMUM OF 9'-6" ABOVE FINISHED GRADE.
  5. CONTRACTOR SHALL MOUNT ALL EXTERIOR EQUIPMENT PER SUPPLIER INSTRUCTIONS.

DRAWING FOR CONTRACTOR COORDINATION PURPOSES. TPSS SHALL BE OWNER SUPPLIED WHEN AVAILABLE. SEE NOTE 5.

REV	DATE	DESCRIPTION	DESIGNED BY	JDW			ISSUED FOR BID	DATE: 12-23-2022	<b>KANSAS CITY STREETCAR - RIVERFRONT EXTENSION</b>	SCALE FOR 22"x34": NOT TO SCALE	
			CHECKED BY	PGL			 HDR Engineering, Inc.	 The HNTB COMPANIES		TRACTION POWER	FILENAME:
			DRAWN BY	JDW			10450 Holmes Road	INFRASTRUCTURE SOLUTIONS		TYPICAL SURGER ARRESTER	CONTRACT NO.:
			CHECKED BY	PGL			Suite 600	300 Apollo Drive		INTERIOR ELEVATIONS	CONTRACT NO. ###
			APPROVED BY	NKS			Kansas City, MO 64131-3471	Chelmsford, MA 01824			VOLUME:
PLOT DATE: 12/21/2022			5:11:09 PM		DATE	12/23/2022	NOT FOR CONSTRUCTION		DRAWING NO.: <b>J623</b>	SHEET NO.: <b>140</b>	





- NOTES:**
- FOR TYPICAL TPSS LAYOUT, SEE SHEET J620 FOR DETAILS.
  - REFER TO CIVIL PLANS FOR DEMO, PROPERTY LINES, FENCING, GRADING, CURBING, AND CONTINUATION OF DUCTBANKS.
  - STRAY CURRENT PULLBOXES PROVIDED FOR FUTURE CONNECTION.
  - SEE SHEET J632 FOR GROUND GRID DETAILS.
  - SEE SHEET J680 FOR CONDUCTOR SCHEDULE.
  - APPROXIMATE LOCATION OF EXISTING EVERGY MANHOLE SHOWN. CONTRACTOR TO FIELD VERIFY PRIOR TO CONSTRUCTION.
  - CONTRACTOR TO FURNISH AND INSTALL SECTIONALIZER FOUNDATION/VAULT IN COORDINATION WITH EVERGY FOR REQUIREMENTS. EVERGY TO FURNISH AND INSTALL SECTIONALIZER SWITCHGEAR.
  - 5'-0" CLEARANCE FROM STEAM PIPELINE FOUNDATIONS MUST BE MAINTAINED WHEN EXCAVATING 3'-0" BELOW GRADE.
  - SEE SHEET C402 FOR DUCTBANK DETAILS. CONTRACTOR SHALL COORDINATE ELEVATIONS OF SITE DUCTBANKS WHERE DUCTBANKS CROSS.
  - CONTRACTOR SHALL FIELD VERIFY EXISTING EVERGY DUCTBANK LOCATION AND COORDINATE INSTALLATION OF NEW DUCTBANK TO EXISTING EVERGY MANHOLE WITH EVERGY PRIOR TO CONSTRUCTION.
  - ALL FLOOR/CONDUIT CUT OUTS SHALL BE COORDINATED BETWEEN THE PROCUREMENT SUPPLIER AND THE CONTRACTOR. DUCTBANK ROUTING SHALL BE ADJUSTED AS NEEDED TO COORDINATE WITH FINAL FLOOR CUTOUT LOCATIONS PROVIDED BY THE TPSS SUPPLIER.

REV	DATE	DESCRIPTION	DESIGNED BY	JDW
			CHECKED BY	PGL
			DRAWN BY	JDW
			CHECKED BY	PGL
			APPROVED BY	NKS

PLOT DATE: 12/21/2022

5:11:31 PM

DATE 12/23/2022

**RideKC STREETCAR**

**This set of plans is not for construction. These plans are intended to build interest in bidding the project.**

ISSUED FOR BID

DATE: 12-23-2022

**HNTB**

The HNTB COMPANIES  
INFRASTRUCTURE SOLUTIONS

10450 Holmes Road  
Suite 600  
Kansas City, MO 64131-3471  
816-360-2700  
Certificate of Authority: 000856

300 Apollo Drive  
Chelmsford, MA 01824  
Phone: 978-905-4000  
Certificate of Authority: 001270

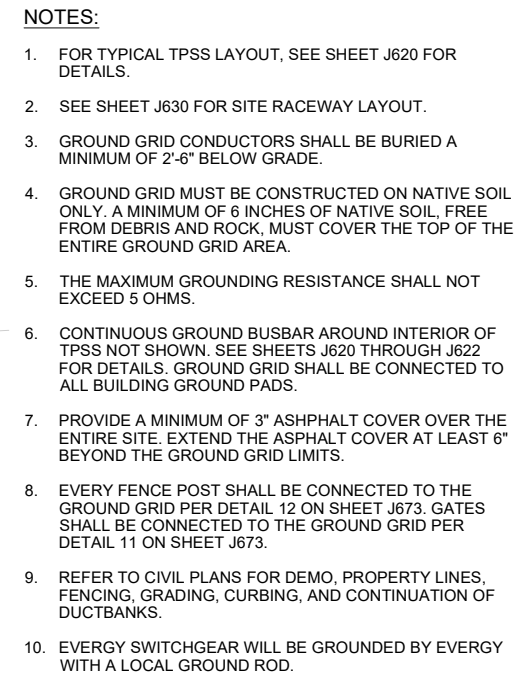
**KANSAS CITY STREETCAR - RIVERFRONT EXTENSION**








TRACTION POWER  
TPSS D1  
SITE RACEWAY LAYOUT

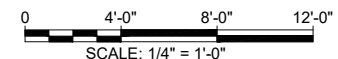
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1/4" = 1'-0"


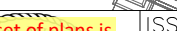
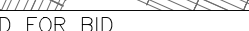
FILENAME:  
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CONTRACT NO.:  
CONTRACT NO. ###  
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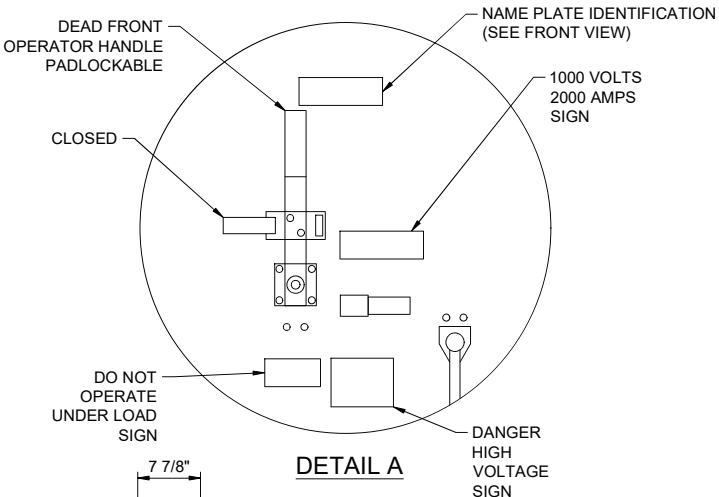
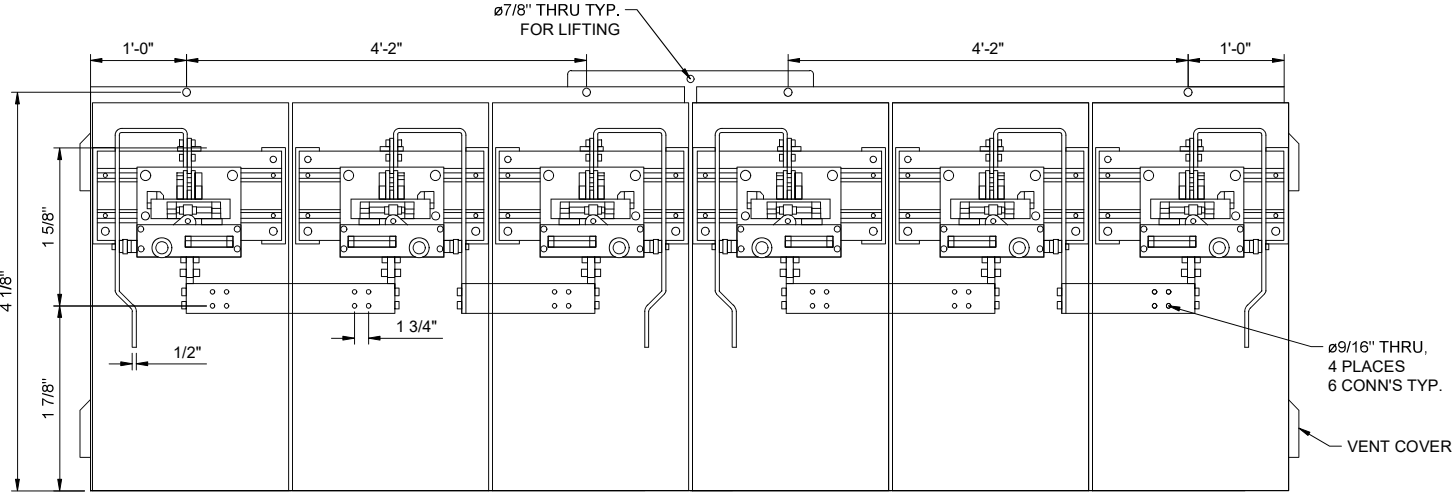
DRAWING NO.: **J630** SHEET NO.: **141**



	3/4" DIA. X 10'-0" LONG COPPERCLAD STEEL GROUND ROD
	GROUND TEST WELL WITH GROUND ROD
	EXOTHERMIC WELD
	#4/0 EQUIPMENT CONNECTION (PIGTAIL)
	#4/0 BARE GROUND CONDUCTOR
	GROUND BUSBAR (SEE NOTE 6)
	FENCE POST WITH GROUND CONNECTION



REV	DATE	DESCRIPTION	DESIGNED BY JDW			ISSUED FOR BID	DATE: 12-23-2022	<b>KANSAS CITY STREETCAR - RIVERFRONT EXTENSION</b>  TRACTION POWER TPSS D1 GROUND GRID LAYOUT	SCALE FOR 22"x34": 1/4" = 1'-0"
			CHECKED BY PGL				<b>HNTB</b> The HNTB COMPANIES INFRASTRUCTURE SOLUTIONS 300 Apollo Drive Chelmsford, MA 01824 Phone: 978-905-4000 Certificate of Authority: 001270		
			DRAWN BY JDW						
			CHECKED BY PGL						
			APPROVED BY NKS						
PLOT DATE: 12/21/2022			DATE: 12/23/2022	10450 Holmes Road Suite 600 Kansas City, MO 64131-3471 816-360-2700 Certificate of Authority: 000856		NOT FOR CONSTRUCTION		FILENAME: J630-J632.DWG CONTRACT NO.: CONTRACT NO.: ### VOLUME: 1	
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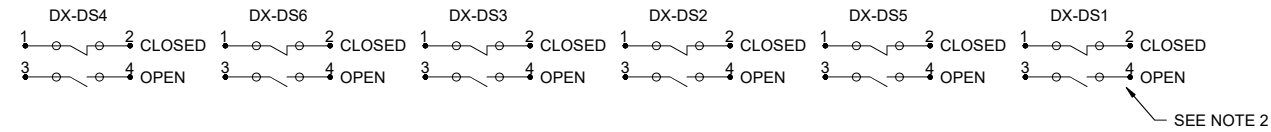
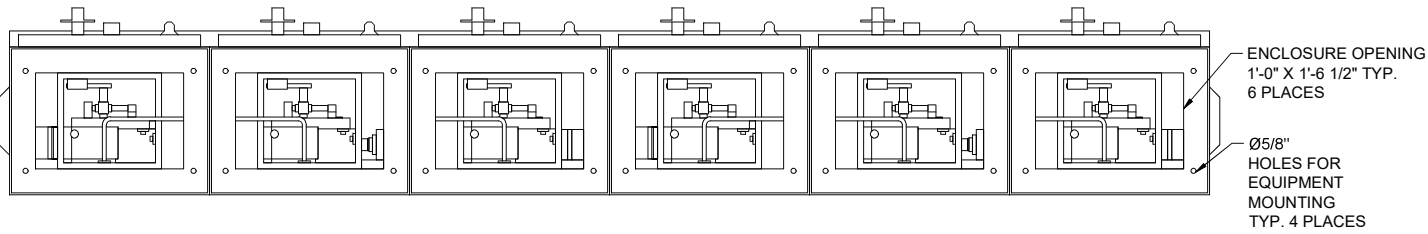
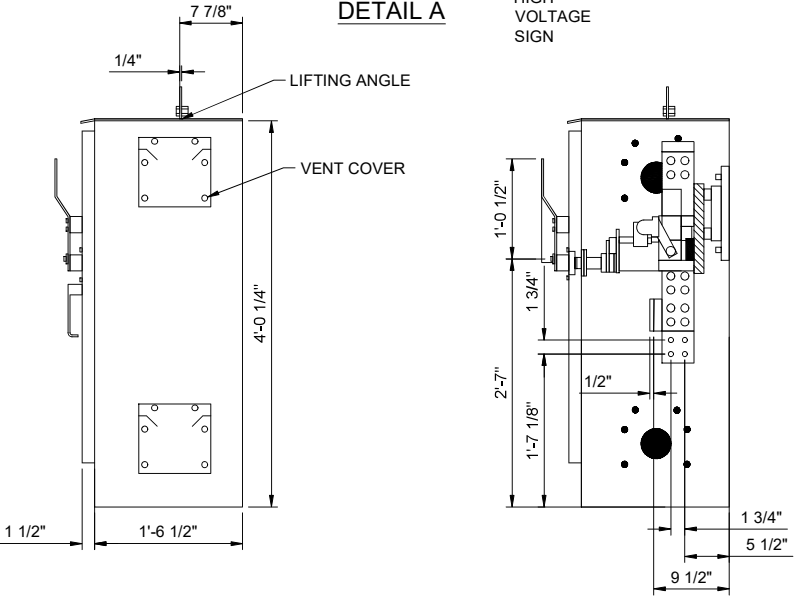
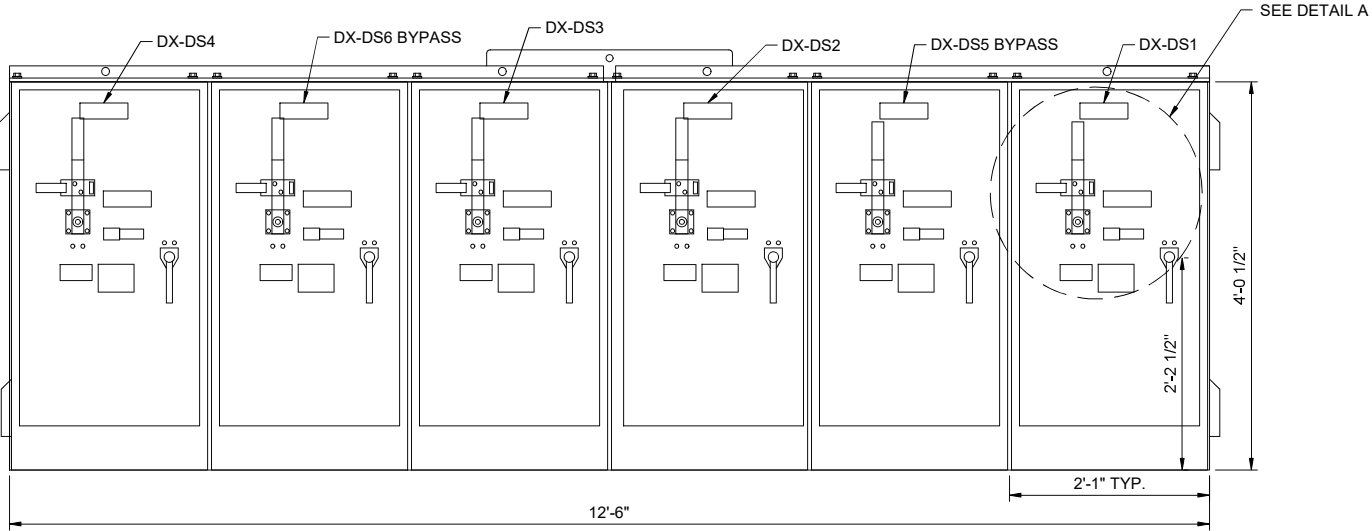


**DISCONNECT SWITCH FEATURES:**

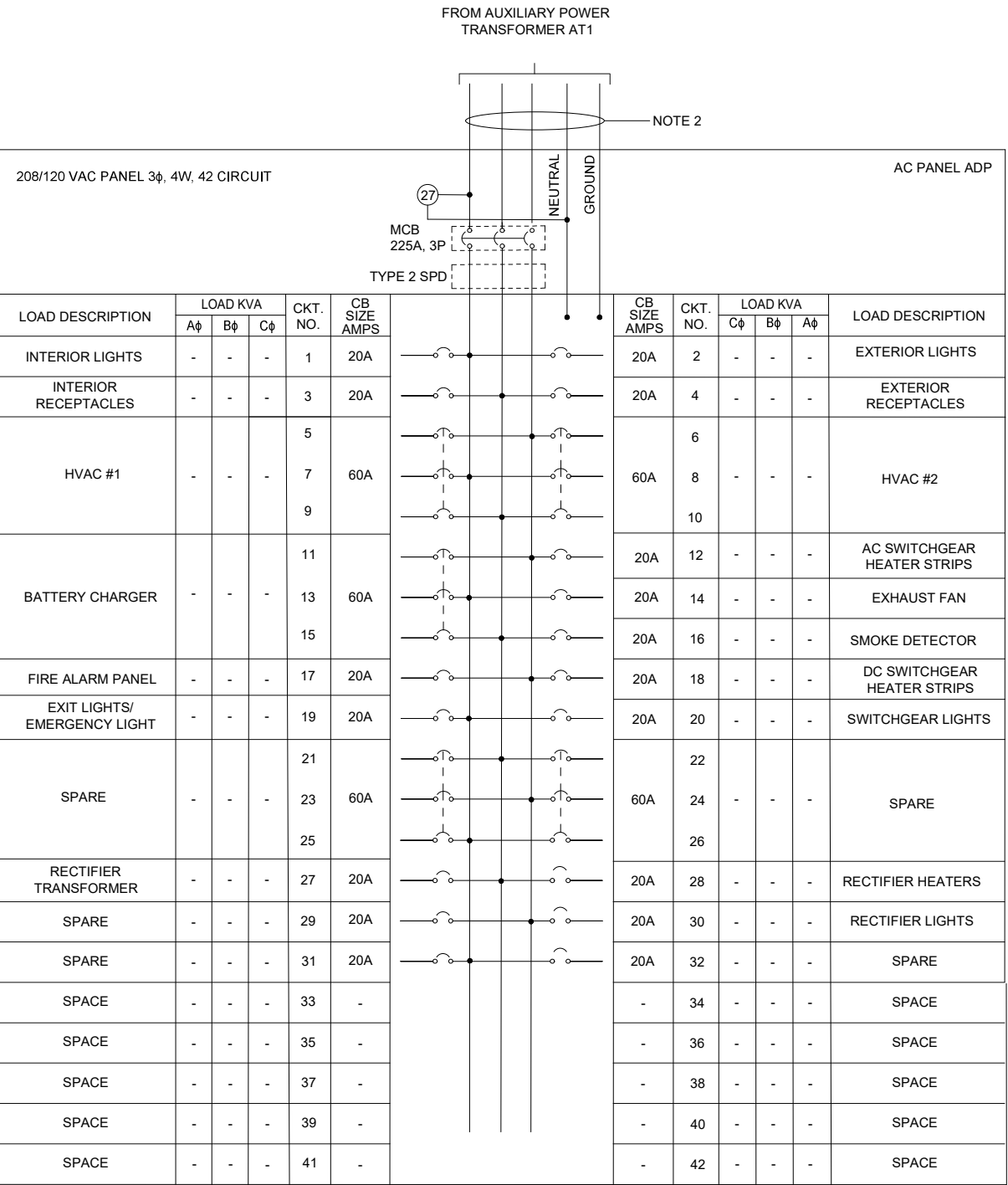
- (6) 2000 AMP DISCONNECT SWITCHES
- 1000VDC SWITCH & BUSBAR INSULATION RATING
- SINGLE POLE, SINGLE THROW, BOLTED PRESSURE TYPE SWITCHES
- NON-FUSIBLE
- NON-LOAD BREAK OPERATION
- 2000 AMP MAIN BUSBAR CAPACITY
- SILVER PLATED TERMINALS
- 1 NO./NC AUX. CONTACT FOR POSITION INDICATION
- FRONT OPERATED WITH PADLOCK FEATURE
- OPERATOR HANDLE AND DOOR ARE MECHANICALLY INTERLOCKED TO PREVENT DOOR OPENING WITH THE SWITCH IN THE CLOSED POSITION
- OPERATOR HANDLE GROUNDED
- NEMA 4X PAD MOUNTED FIBERGLASS ENCLOSURE:
  - ANSI 61 GRAY EXTERIOR AND WHITE INTERIOR
  - CONTINUOUS STAINLESS STEEL HINGE
  - DOOR PERIMETER IS FULLY GASKETED
  - 3 POINT HANDLE IS PADLOCKABLE
- APPROX. WT. - 1500 LBS

**NOTES:**

1. DIMENSIONS PROVIDED ARE TYPICAL. FINAL DIMENSIONS SHALL BE DETERMINED BY DISCONNECT SWITCH MANUFACTURER.
2. EACH DISCONNECT SWITCH POSITION STATUS INDICATIONS SHALL BE REPORTED TO THE SAS PLC. SEE SITE SPECIFIC CONDUCTOR SCHEDULE FOR CABLE REQUIREMENTS.
3. PAD-MOUNTED DISCONNECT SWITCHES FURNISHED AND INSTALLED BY THE CONTRACTOR.



REV	DATE	DESCRIPTION	DESIGNED BY	JDW			ISSUED FOR BID	DATE: 12-23-2022	<b>KANSAS CITY STREETCAR - RIVERFRONT EXTENSION</b>	TRACTION POWER TYPICAL DISCONNECT SWITCH ARRANGEMENT	SCALE FOR 22"x34": NOT TO SCALE	
			CHECKED BY	PGL			 HNTB Engineering, Inc. The HNTB COMPANIES INFRASTRUCTURE SOLUTIONS 10450 Holmes Road Suite 600 Kansas City, MO 64131-3471 816-360-2700 Certificate of Authority: 000856	 HNTB The HNTB COMPANIES INFRASTRUCTURE SOLUTIONS 300 Apollo Drive Chelmsford, MA 01824 Phone: 978-905-4000 Certificate of Authority: 001270			FILENAME:	
			DRAWN BY	JDW							CONTRACT NO.:	
			CHECKED BY	PGL							CONTRACT NO. ###	VOLUME:
			APPROVED BY	NKS							1	DRAWING NO.:
PLOT DATE: 12/21/2022			5:11:46 PM		DATE	12/23/2022	NOT FOR CONSTRUCTION		J640	143	SHEET NO.:	



AC PANEL ADP - PANEL SCHEDULE

SCALE: NOT TO SCALE

NOTES:

- FOR COORDINATION PURPOSES ONLY. REFER TO VENDOR'S AC PANELBOARD DRAWING FOR AC PANEL LAYOUT
- ALL INTERNAL BUILDING WIRING AND FINAL BREAKER SIZES TO BE DETERMINED BY VENDOR (OWNER SUPPLIED) IN COORDINATION WITH THE CONTRACTOR (THIS CONTRACT).
- SHOP DRAWINGS TO BE PROVIDED BY THE OWNER WHEN AVAILABLE.
- DRAWING FOR CONTRACTOR COORDINATION PURPOSES. TPSS SHALL BE OWNER SUPPLIED AND SHOP DRAWINGS SUPPLIED WHEN AVAILABLE.

DRAWING FOR CONTRACTOR COORDINATION PURPOSES. TPSS SHALL BE OWNER SUPPLIED WHEN AVAILABLE.



NI-CD BATTERY

125VDC

DISCONNECT SWITCH DS-1

100A

100A

NOTE 2

27

MCB 150A 2P

125 VDC PANEL, 2W, 40 CIRCUIT

DC PANEL DDP

LOAD DESCRIPTION	LOAD WATTS	CB CKT. NO.	SIZE AMPS		SIZE AMPS	CB CKT. NO.	LOAD WATTS	LOAD DESCRIPTION
BATTERY CHARGER INPUT	-	1	50A		20A	2	-	AC SWITCHGEAR
		3				4		
DC BREAKER TEST CABINET	-	5	20A		20A	6	-	SWITCH POSITION LIGHTS
		7				8		
SPARE	-	9	20A		30A	10	-	DC SWITCHGEAR POSITIVE 89P CUBICLE
		11				12		
ADC BREAKER TEST CABINET	-	13	20A		20A	14	-	DC SWITCHGEAR NEGATIVE 89N CUBICLE
		15				16		
STATION CONTROL CABINET	-	17	20A		20A	18	-	DC FEEDER 1
		19				20		
SPARE	-	21	20A		20A	22	-	DC FEEDER 2
		23				24		
SPARE	-	25	20A		20A	26	-	RECTIFIER TRANSFORMER
		27				28		
SPARE	-	29	20A		20A	30	-	SPARE
		31				32		
SPARE	-	33	20A		20A	34	-	SPARE
		35				36		
SPARE	-	37	20A		20A	38	-	SPARE
		39				40		

DC PANEL DDP - PANEL SCHEDULE

SCALE: NOT TO SCALE

DRAWING FOR CONTRACTOR COORDINATION PURPOSES. TPSS SHALL BE OWNER SUPPLIED WHEN AVAILABLE.

REV	DATE	DESCRIPTION	DESIGNED BY	JDW
			CHECKED BY	PGL
			DRAWN BY	JDW
			CHECKED BY	PGL
			APPROVED BY	NKS

12/21/2022

5:12:50 PM

12/23/2022

RideKC STREETCAR

This set of plans is not for construction. These plans are intended to build interest in bidding the project.

12/22/2022

ISSUED FOR BID

DATE: 12-23-2022

HDR

HDR Engineering, Inc.

10450 Holmes Road

Suite 600

Kansas City, MO 64131-3471

816-360-2700

Certificate of Authority: 000856

HNTB

The HNTB COMPANIES

INFRASTRUCTURE SOLUTIONS

300 Apollo Drive

Chelmsford, MA 01824

Phone: 978-905-4000

Certificate of Authority: 001270

NOT FOR CONSTRUCTION

KANSAS CITY STREETCAR - RIVERFRONT EXTENSION

TRACTION POWER

125V DC PANEL DDP

PANEL SCHEDULE

SCALE FOR 22"x34":

NOT TO SCALE

FILENAME:

J643.DWG

CONTRACT NO.:

CONTRACT NO. ###

VOLUME:

1

DRAWING NO.:

J643

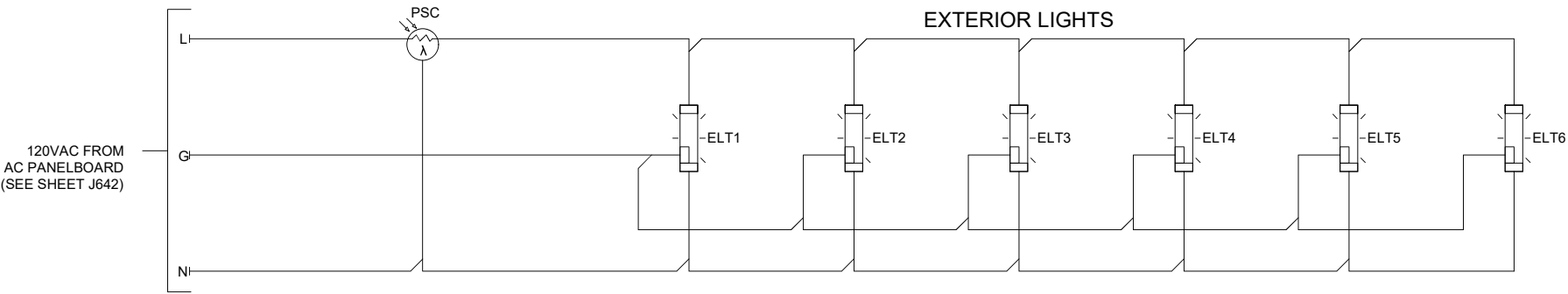
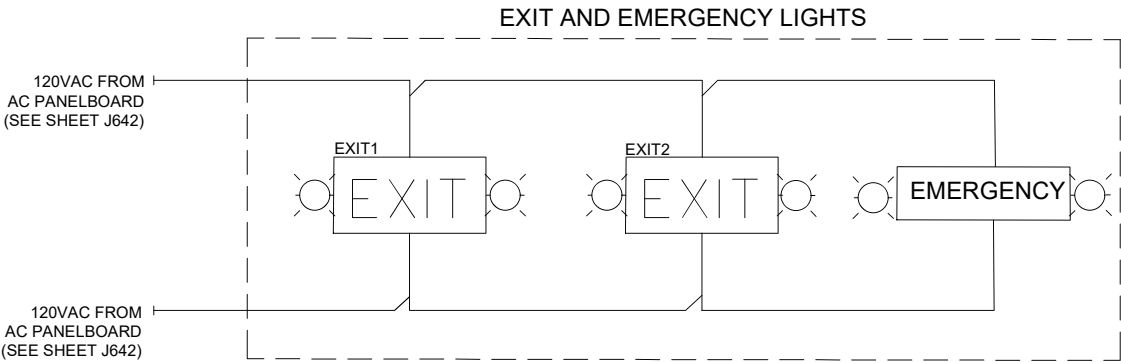
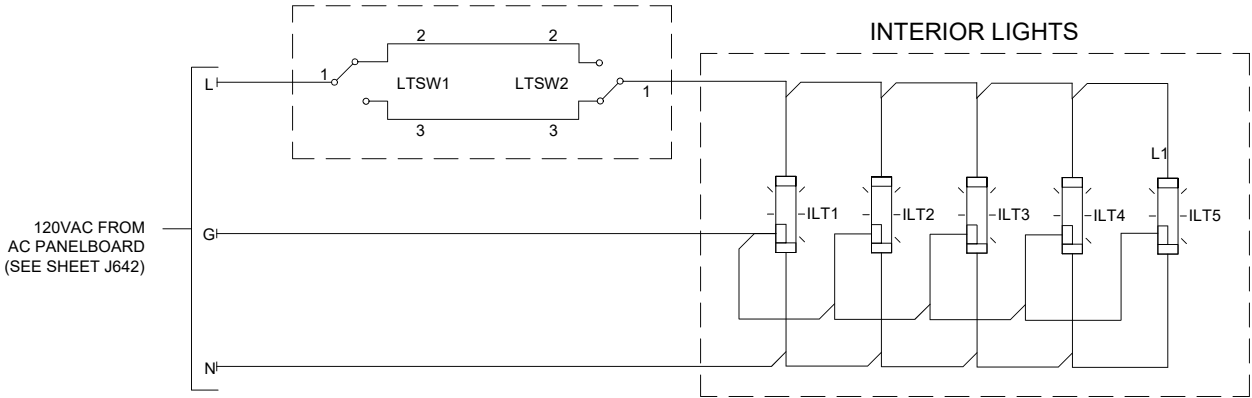
SHEET NO.:

145

302977

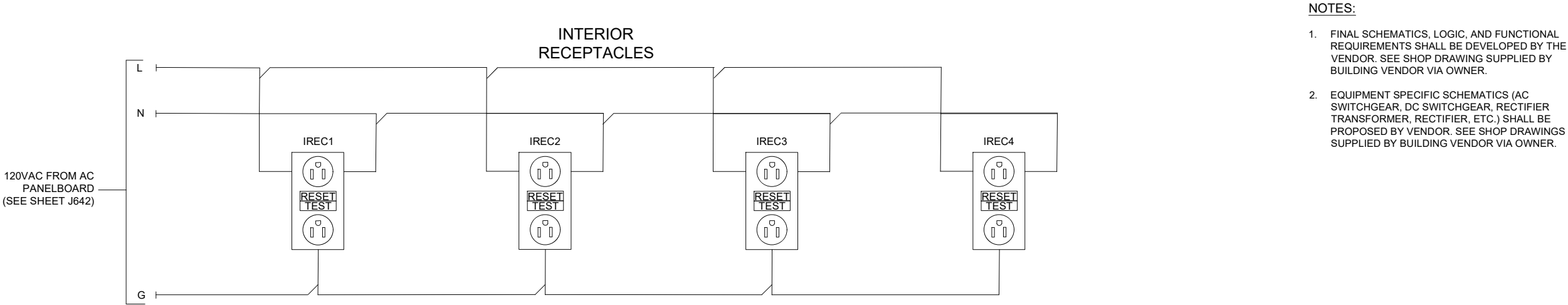
NOTES:

- 1. FINAL SCHEMATICS, LOGIC, AND FUNCTIONAL REQUIREMENTS SHALL BE DEVELOPED BY THE VENDOR.
- 2. EQUIPMENT CUBICLE LIGHTING AND HEATING TO BE PROPOSED BY VENDOR. SEE SHOP DRAWINGS SUPPLIED BY BUILDING VENDOR VIA OWNER.
- 3. EQUIPMENT SPECIFIC SCHEMATICS (AC SWITCHGEAR, DC SWITCHGEAR, RECTIFIER TRANSFORMER, RECTIFIER, ETC.) SHALL BE PROPOSED BY VENDOR. SEE SHOP DRAWINGS SUPPLIED BY BUILDING VENDOR VIA OWNER.

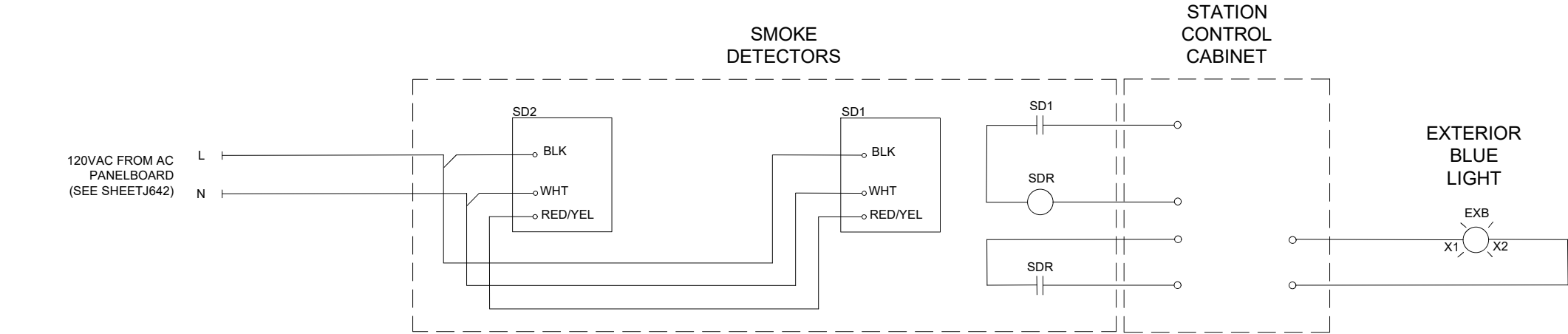


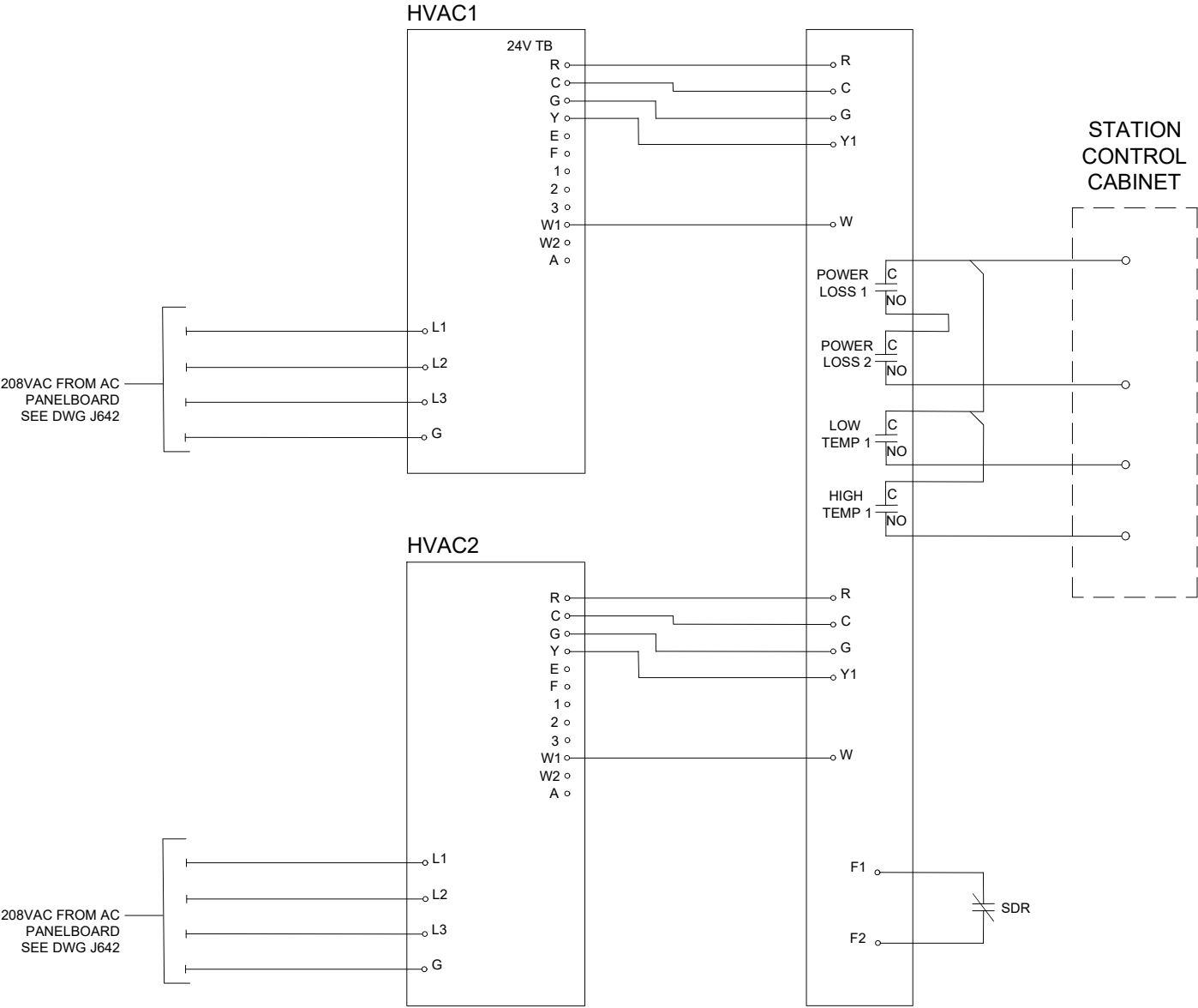
DRAWING FOR CONTRACTOR COORDINATION PURPOSES. TPSS SHALL BE OWNER SUPPLIED WHEN AVAILABLE.

REV	DATE	DESCRIPTION	DESIGNED BY	JDW		<div>This set of plans is not for construction. These plans are intended to build interest in bidding the project.</div>	ISSUED FOR BID		DATE: 12-23-2022	 <div>The HNTB COMPANIES INFRASTRUCTURE SOLUTIONS 10450 Holmes Road Suite 600 Kansas City, MO 64131-3471 816-360-2700 Certificate of Authority: 000856</div>	KANSAS CITY STREETCAR - RIVERFRONT EXTENSION			SCALE FOR 22"x34": NOT TO SCALE	
			CHECKED BY	PGL			HNTB				TRACTION POWER		FILENAME: J644.DWG		
			DRAWN BY	JDW							TYPICAL TPSS LIGHTING SCHEMATIC		CONTRACT NO.: CONTRACT NO. ###		
			CHECKED BY	PGL									VOLUME: 1		
			APPROVED BY	NKS									DRAWING NO.: J644		
PLOT DATE: 12/21/2022			5:13:15 PM		DATE: 12/23/2022		NOT FOR CONSTRUCTION				SHEET NO.: 146				

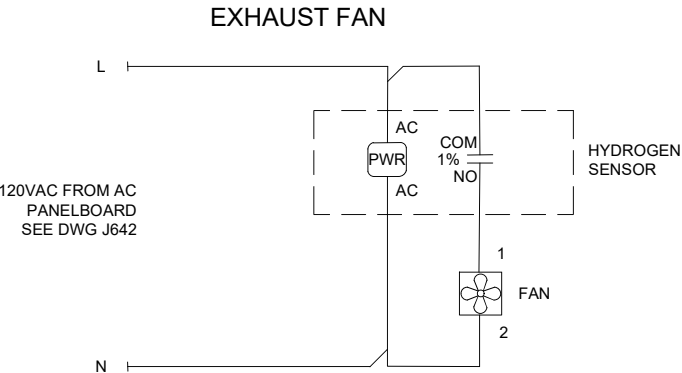


- NOTES:
1. FINAL SCHEMATICS, LOGIC, AND FUNCTIONAL REQUIREMENTS SHALL BE DEVELOPED BY THE VENDOR. SEE SHOP DRAWING SUPPLIED BY BUILDING VENDOR VIA OWNER.
  2. EQUIPMENT SPECIFIC SCHEMATICS (AC SWITCHGEAR, DC SWITCHGEAR, RECTIFIER TRANSFORMER, RECTIFIER, ETC.) SHALL BE PROPOSED BY VENDOR. SEE SHOP DRAWINGS SUPPLIED BY BUILDING VENDOR VIA OWNER.





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  - 2. EQUIPMENT SPECIFIC SCHEMATICS (AC SWITCHGEAR, DC SWITCHGEAR, RECTIFIER TRANSFORMER, RECTIFIER, ETC.) SHALL BE PROPOSED BY VENDOR. SEE SHOP DRAWINGS SUPPLIED BY BUILDING VENDOR VIA OWNER.



DRAWING FOR CONTRACTOR COORDINATION PURPOSES. TPSS SHALL BE OWNER SUPPLIED WHEN AVAILABLE.

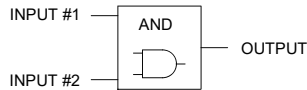
REV	DATE	DESCRIPTION	DESIGNED BY	JDW			ISSUED FOR BID	DATE: 12-23-2022	<b>KANSAS CITY STREETCAR - RIVERFRONT EXTENSION</b>	TRACTION POWER TYPICAL TPSS HVAC AND VENTILATION SCHEMATIC	SCALE FOR 22"x34": NOT TO SCALE FILENAME: J646.DWG CONTRACT NO.: CONTRACT NO. ### VOLUME: 1	DRAWING NO.: J646	SHEET NO.: 148
			CHECKED BY	PGL			 <div>HDR Engineering, Inc. 10450 Holmes Road Suite 600 Kansas City, MO 64131-3471 816-360-2700 Certificate of Authority: 000856</div>	 <div>The HNTB COMPANIES INFRASTRUCTURE SOLUTIONS 300 Apollo Drive Chelmsford, MA 01824 Phone: 978-905-4000 Certificate of Authority: 001270</div>					
			DRAWN BY	WAC									
			CHECKED BY	PGL									
			APPROVED BY	NKS									
PLOT DATE: 12/21/2022			5:13:46 PM		DATE	12/23/2022	NOT FOR CONSTRUCTION						

This set of plans is not for construction. These plans are intended to build interest in bidding the project.



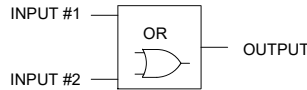
- NOTES:
- FOR COORDINATION ONLY. FINAL SCHEMATICS, LOGIC, AND FUNCTIONAL REQUIREMENTS SHALL BE DEVELOPED BY THE VENDOR. SEE SHOP DRAWINGS SUPPLIED BY BUILDING VENDOR VIA OWNER.

AND GATE



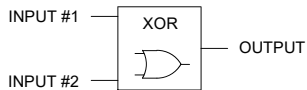
INPUT #1	INPUT #2	OUTPUT
0	0	0
0	1	0
1	0	0
1	1	1

OR GATE



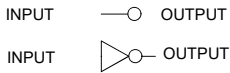
INPUT #1	INPUT #2	OUTPUT
0	0	0
0	1	1
1	0	1
1	1	1

EXCLUSIVE OR GATE



INPUT #1	INPUT #2	OUTPUT
0	0	0
0	1	1
1	0	1
1	1	0

SIGNAL INVERSION



INPUT	OUTPUT
0	1
1	0

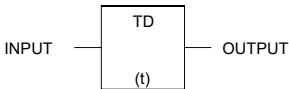
SET OVER RESET OPERATOR



INPUT #1	INPUT #2	OUTPUT (LATCHED)
0	0	PREVIOUS STATE
0	1	0
1	0	1
1	1	PREVIOUS STATE

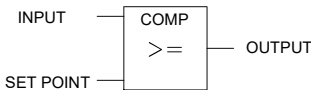
OUTPUT CHANGES STATE ONLY UPON RISING EDGE OF INPUT SIGNAL

TIME DELAY



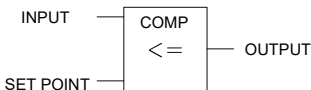
A RISING EDGE ON THE INPUT STARTS THE TIMER(t). THE TIMER COUNTS AS LONG AS THE INPUT IS HIGH. IF THE TIMER EXPIRES WHILE THE INPUT IS HIGH THE OUTPUT BECOMES ACTIVE. A FALLING INPUT EDGE RESETS THE TIMER.

GREATER THAN COMPARATOR



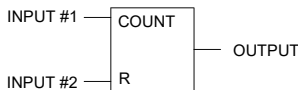
IF THE INPUT VALUE IS GREATER THAN OR EQUAL TO THE SET POINT, THE OUTPUT BECOMES ACTIVE.

LESS THAN COMPARATOR



IF THE INPUT VALUE IS LESS THAN OR EQUAL TO THE SET POINT, THE OUTPUT BECOMES ACTIVE.

COUNTER

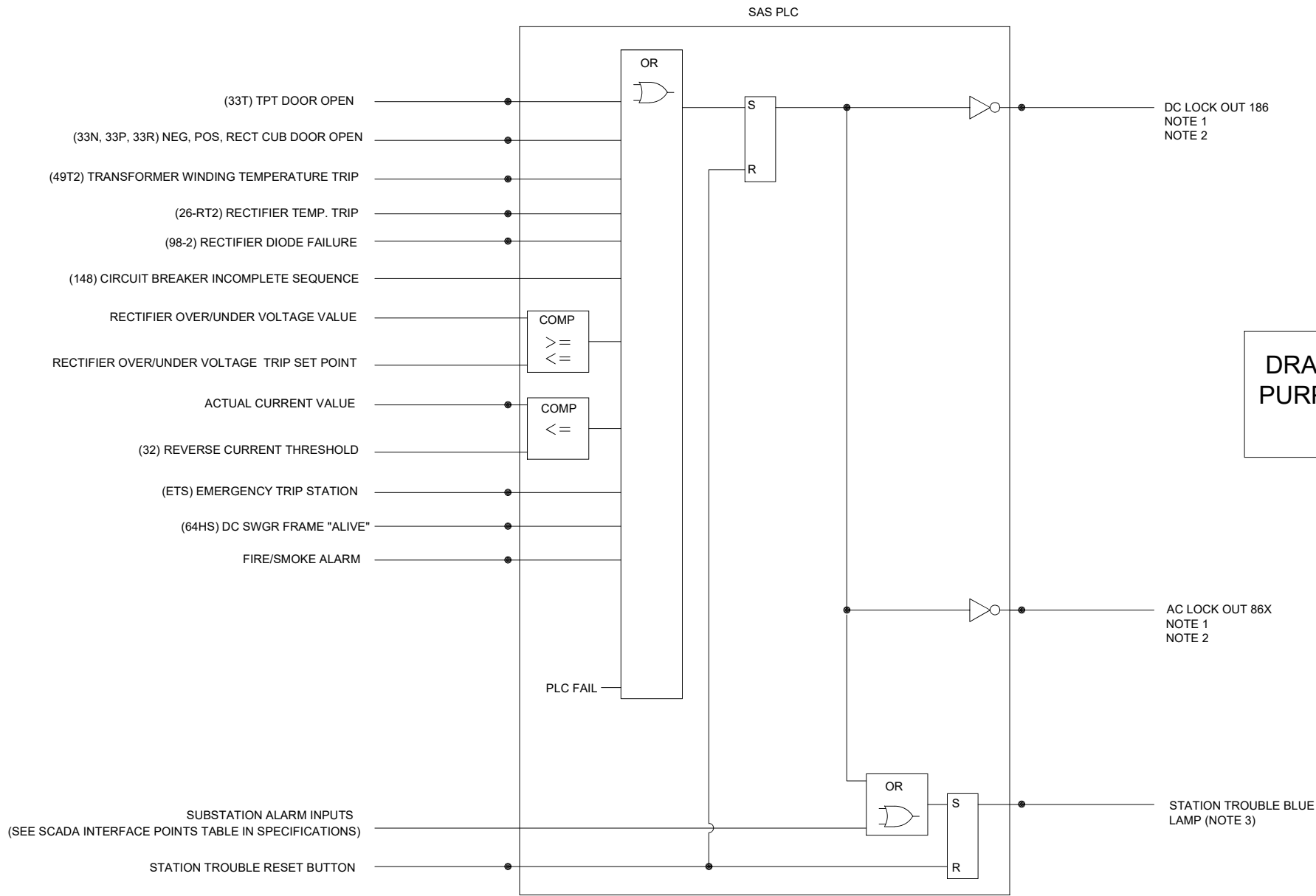


EACH TIME INPUT #1 IS PULSED HIGH THE COUNTER INCREMENTS AND THE OUTPUT REFLECTS THE COUNT VALUE. WHEN INPUT #2 IS PULSED HIGH THE COUNT VALUE IS RESET.

DRAWING FOR CONTRACTOR COORDINATION PURPOSES. TPSS SHALL BE OWNER SUPPLIED WHEN AVAILABLE.

REV	DATE	DESCRIPTION	DESIGNED BY	JDW			ISSUED FOR BID	DATE: 12-23-2022	KANSAS CITY STREETCAR - RIVERFRONT EXTENSION	SCALE FOR 22"x34": NOT TO SCALE			
			CHECKED BY	PGL									
			DRAWN BY	WAC									
			CHECKED BY	PGL									
			APPROVED BY	NKS									
PLOT DATE: 12/21/2022			5:14:00 PM		DATE: 12/23/2022		NOT FOR CONSTRUCTION		TRACTION POWER LOGIC DIAGRAMS SYMBOLS AND LEGEND				
										FILENAME: J648.DWG			
										CONTRACT NO.: CONTRACT NO. ###			
										VOLUME: 1			
										DRAWING NO.: J648			
										SHEET NO.: 149			

SUBSTATION LOCKOUT AND ALARM LOGIC

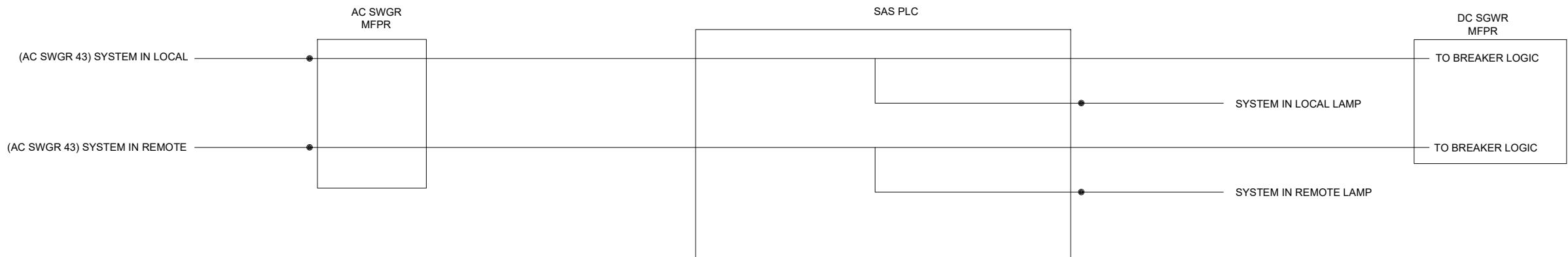


NOTES:

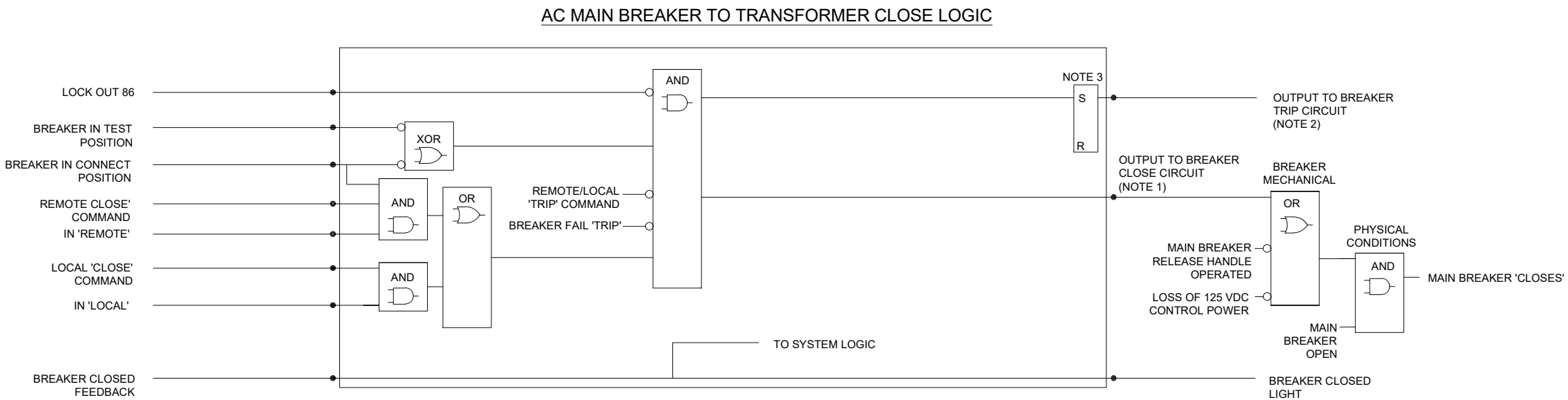
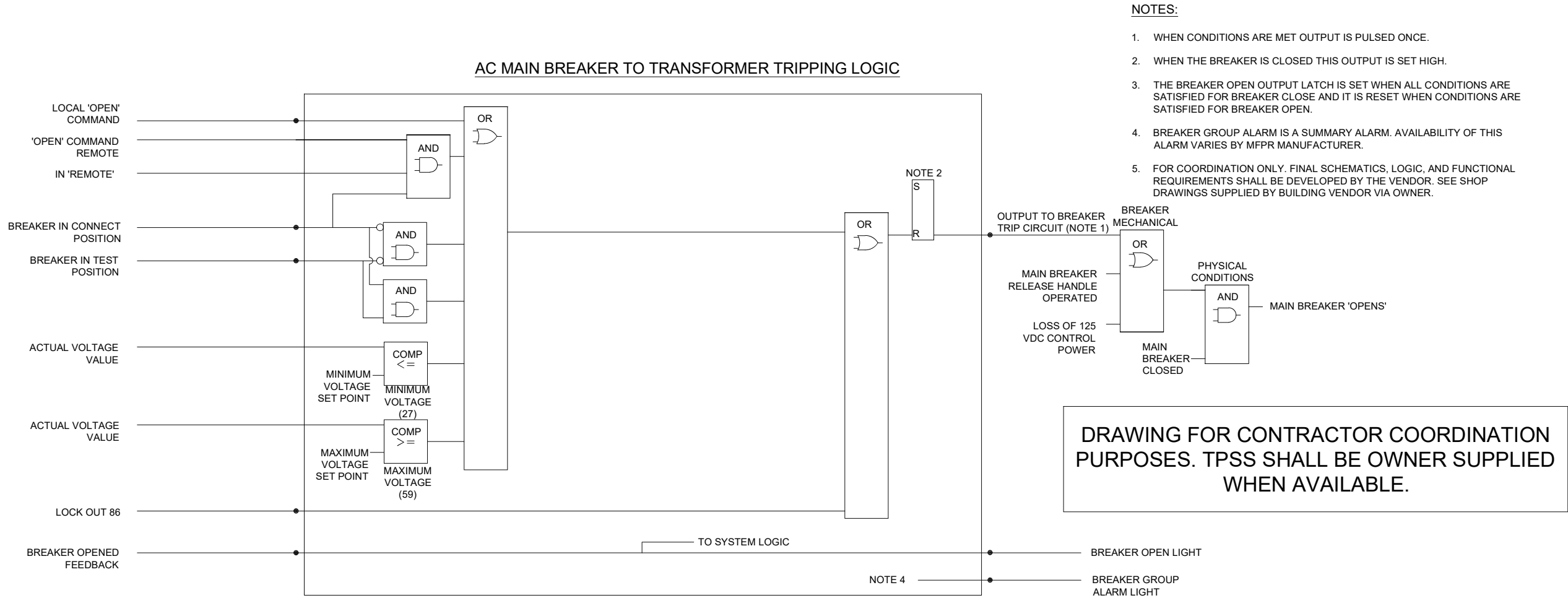
1. PLC OUTPUT ACTIVATES LOCKOUT RELAY 186 & 86X.
2. THIS SIGNAL IS ACTIVE LOW.
3. FLASHING BLUE LIGHT (NEW UNACKNOWLEDGED ALARM)  
SOLID BLUE LIGHT (ACTIVE ACKNOWLEDGED ALARMS)  
BLUE LIGHT OFF (NO ACTIVE ALARMS).
4. FOR COORDINATION ONLY. FINAL SCHEMATICS, LOGIC, AND FUNCTIONAL REQUIREMENTS SHALL BE DEVELOPED BY THE VENDOR. SEE SHOP DRAWINGS SUPPLIED BY BUILDING VENDOR VIA OWNER.

DRAWING FOR CONTRACTOR COORDINATION PURPOSES. TPSS SHALL BE OWNER SUPPLIED WHEN AVAILABLE.

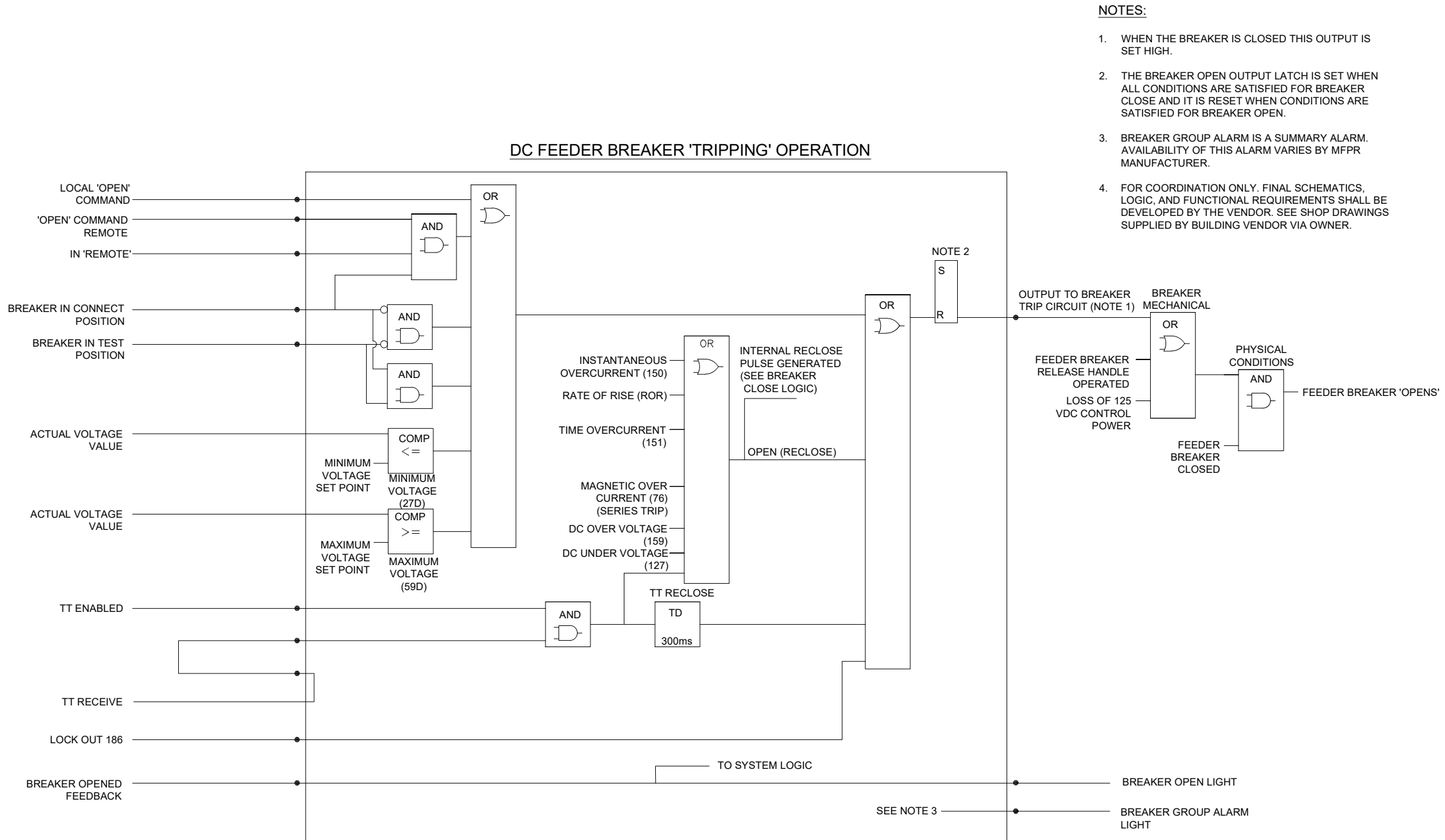
LOCAL / REMOTE LOGIC



REV			DATE			DESCRIPTION			DESIGNED BY			JDW									ISSUED FOR BID						DATE: 12-23-2022						KANSAS CITY STREETCAR - RIVERFRONT EXTENSION												SCALE FOR 22"x34": NOT TO SCALE				
									CHECKED BY			PGL									 HDR Engineering, Inc. The HNTB COMPANIES INFRASTRUCTURE SOLUTIONS 10450 Holmes Road Suite 600 Kansas City, MO 64131-3471 816-360-2700 Certificate of Authority: 000856						 The HNTB COMPANIES INFRASTRUCTURE SOLUTIONS 300 Apollo Drive Chelmsford, MA 01824 Phone: 978-905-4000 Certificate of Authority: 001270						TRACTION POWER SUBSTATION LOCKOUT AND ALARM LOGIC DIAGRAM												FILENAME: J649.DWG				
									DRAWN BY			WAC																																	CONTRACT NO.: ###				
									CHECKED BY			PGL																																	VOLUME: 1				
									APPROVED BY			NKS																																	DRAWING NO.:				SHEET NO.:
PLOT DATE: 12/21/2022												5:14:24 PM												DATE			12/23/2022			NOT FOR CONSTRUCTION												J649				150			



REV	DATE	DESCRIPTION	DESIGNED BY	JDW		 HNTB The HNTB COMPANIES INFRASTRUCTURE SOLUTIONS 10450 Holmes Road Suite 600 Kansas City, MO 64131-3471 816-360-2700 Certificate of Authority: 000856	DATE: 12-23-2022	<b>KANSAS CITY STREETCAR - RIVERFRONT EXTENSION</b>	SCALE FOR 22"x34": NOT TO SCALE FILENAME: J650.DWG CONTRACT NO.: CONTRACT NO. ### VOLUME: 1	DRAWING NO.: J650	SHEET NO.: 151
			CHECKED BY	PGL							
			DRAWN BY	JDW							
			CHECKED BY	PGL							
			APPROVED BY	NKS							
PLOT DATE: 12/21/2022			5:14:43 PM		DATE	12/23/2022	NOT FOR CONSTRUCTION				

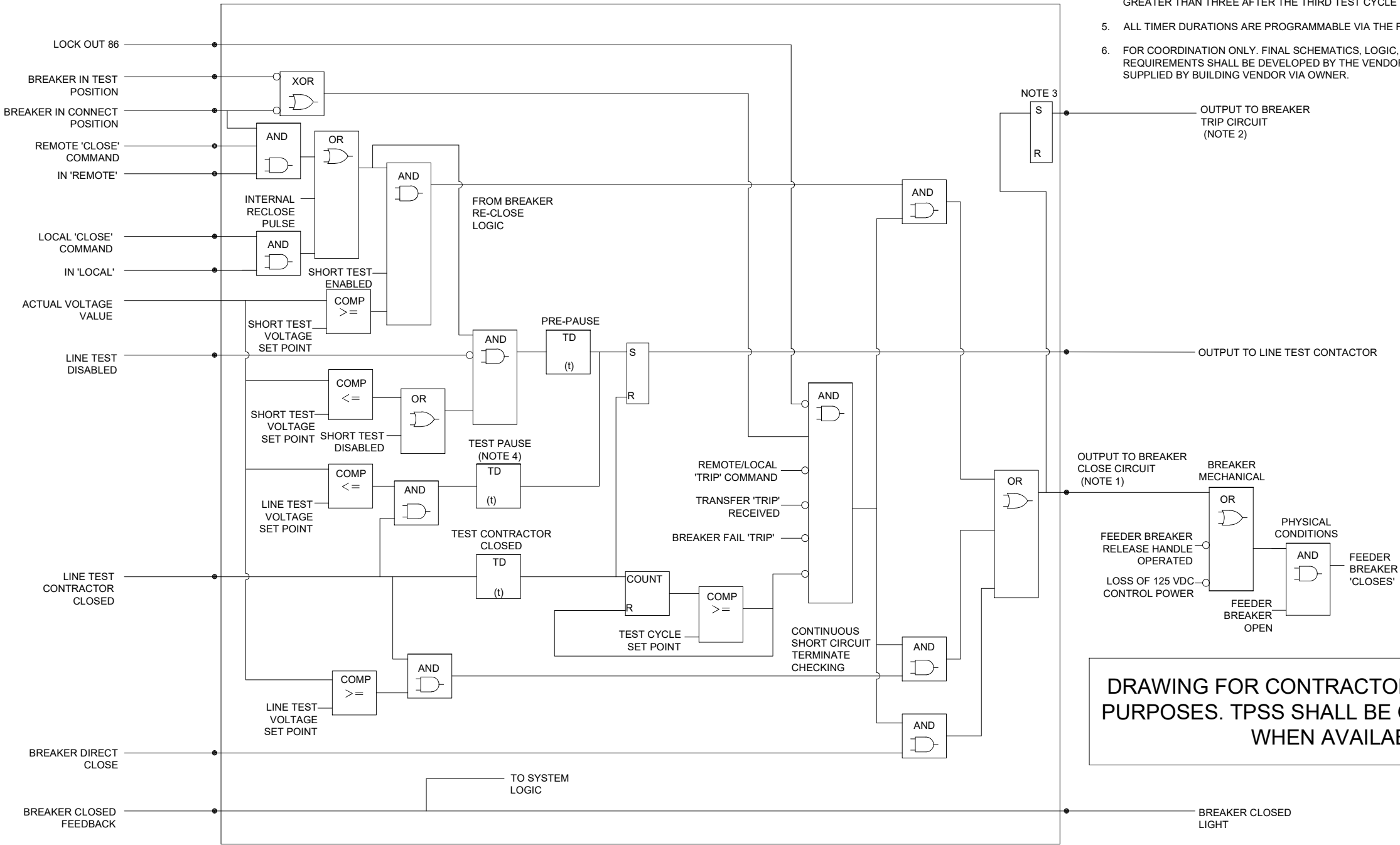


DRAWING FOR CONTRACTOR COORDINATION PURPOSES. TPSS SHALL BE OWNER SUPPLIED WHEN AVAILABLE.

REV	DATE	DESCRIPTION	DESIGNED BY	JDW		 HNTB The HNTB COMPANIES INFRASTRUCTURE SOLUTIONS 10450 Holmes Road Suite 600 Kansas City, MO 64131-3471 816-360-2700 Certificate of Authority: 000856	DATE: <b>12-23-2022</b>	<b>KANSAS CITY STREETCAR - RIVERFRONT EXTENSION</b>	SCALE FOR 22"x34": NOT TO SCALE FILENAME: J652.DWG CONTRACT NO.: CONTRACT NO. ### VOLUME: 1		
			CHECKED BY	PGL							
			DRAWN BY	JDW							
			CHECKED BY	PGL							
			APPROVED BY	NKS							
PLOT DATE: 12/21/2022			5:14:58 PM		DATE	12/23/2022	NOT FOR CONSTRUCTION			DRAWING NO.: <b>J652</b>	SHEET NO.: <b>152</b>



DC FEEDER BREAKER 'CLOSING' OPERATION



- NOTES:
1. WHEN CONDITIONS ARE MET OUTPUT IS PULSED ONCE.
  2. WHEN THE BREAKER IS CLOSED THIS OUTPUT IS SET HIGH.
  3. THE BREAKER OPEN OUTPUT LATCH IS SET WHEN ALL CONDITIONS ARE SATISFIED FOR BREAKER CLOSE AND IT IS RESET WHEN CONDITIONS ARE SATISFIED FOR BREAKER OPEN.
  4. THERE ARE 3 TEST PAUSE TIMERS. THE TIME USED DEPENDS ON THE CURRENT TEST CYCLE COUNT. IN THE EVENT THAT THE NUMBER OF TEST CYCLES IS SET GREATER THAN THREE AFTER THE THIRD TEST CYCLE THE SAME TIME IS USED.
  5. ALL TIMER DURATIONS ARE PROGRAMMABLE VIA THE FRONT DISPLAY.
  6. FOR COORDINATION ONLY. FINAL SCHEMATICS, LOGIC, AND FUNCTIONAL REQUIREMENTS SHALL BE DEVELOPED BY THE VENDOR. SEE SHOP DRAWINGS SUPPLIED BY BUILDING VENDOR VIA OWNER.

DRAWING FOR CONTRACTOR COORDINATION PURPOSES. TPSS SHALL BE OWNER SUPPLIED WHEN AVAILABLE.

REV	DATE	DESCRIPTION	DESIGNED BY	JDW			ISSUED FOR BID		DATE: 12-23-2022	<b>KANSAS CITY STREETCAR - RIVERFRONT EXTENSION</b>	SCALE FOR 22"x34": NOT TO SCALE		
			CHECKED BY	PGL				HNTB Engineering, Inc.			<b>HNTB</b> The HNTB COMPANIES INFRASTRUCTURE SOLUTIONS 10450 Holmes Road Suite 600 Kansas City, MO 64131-3471 816-360-2700 Certificate of Authority: 000856	300 Apollo Drive Chelmsford, MA 01824 Phone: 978-905-4000 Certificate of Authority: 001270	FILENAME: J653.DWG
			DRAWN BY	JDW				NOT FOR CONSTRUCTION					CONTRACT NO.: CONTRACT NO. ###
			CHECKED BY	PGL				TRACTION POWER TYPICAL DC FEEDER CUBICLE LOGIC DIAGRAM SHEET 2 OF 2	VOLUME: 1				
			APPROVED BY	NKS					DRAWING NO.: J653				SHEET NO.: 153
PLOT DATE: 12/21/2022			5:15:07 PM		DATE	12/23/2022							

1. FOR COORDINATION ONLY. FINAL SCHEMATICS, LOGIC, AND FUNCTIONAL REQUIREMENTS SHALL BE DEVELOPED BY THE VENDOR. SEE SHOP DRAWINGS SUPPLIED BY BUILDING VENDOR VIA OWNER.

NEG DISC. SWITCH 89N CLOSED

NEG DISC. SWITCH 89N OPENED

NEGATIVE SWITCH CLOSED LIGHT

OUTPUT TO SAS PLC

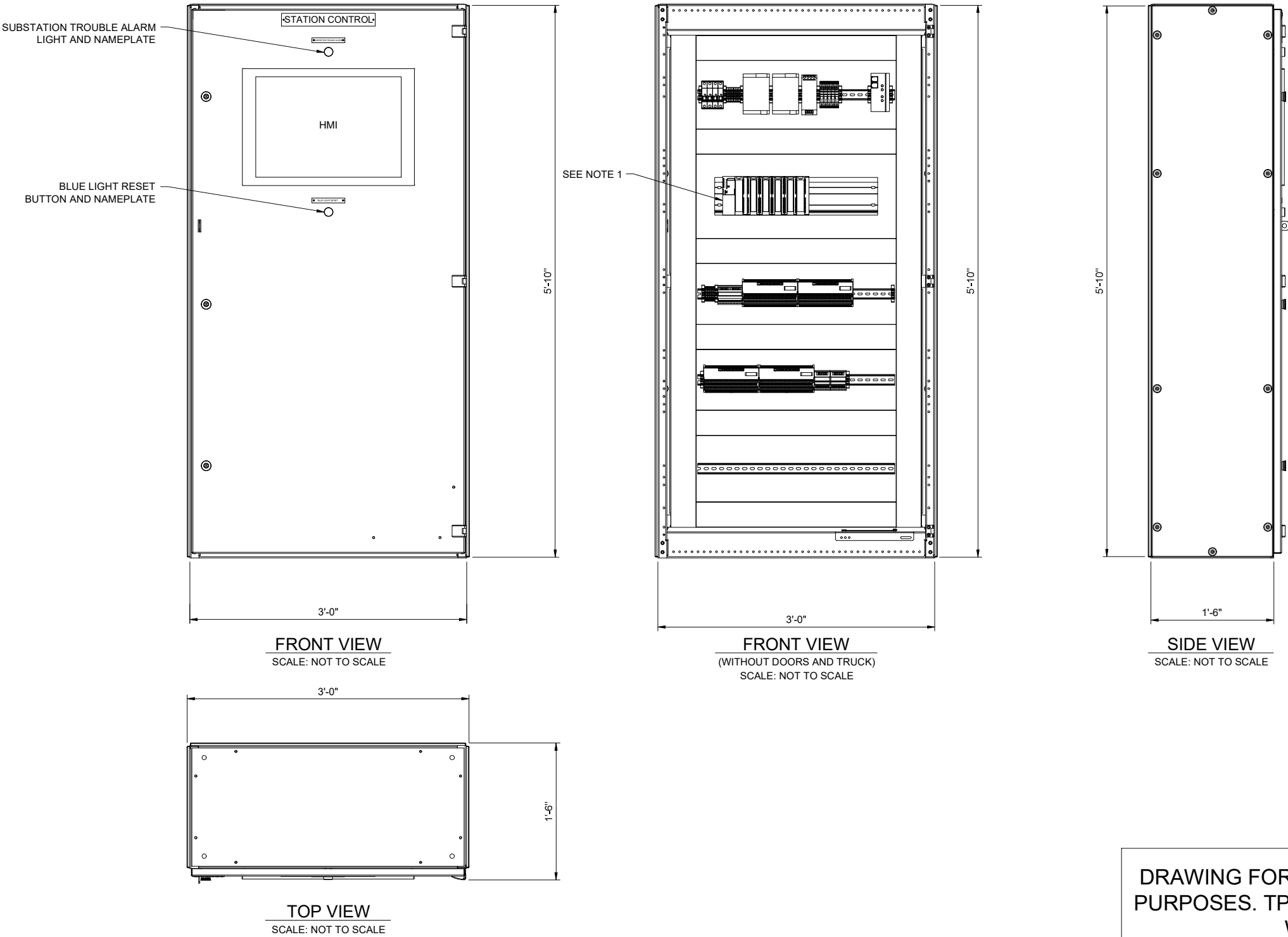
OUTPUT TO SAS PLC

The diagram shows two horizontal lines representing the switch contacts. The top line is labeled 'POS DISC. SWITCH 89P CLOSED' on the left and 'POSITIVE SWITCH CLOSED LIGHT' on the right. The bottom line is labeled 'POS DISC. SWITCH 89P OPENED' on the left and 'POSITIVE SWITCH OPENED LIGHT' on the right. Both lines have a vertical segment in the middle, and a dot is placed on the right side of each line, labeled 'OUTPUT TO SAS PLC'.

DRAWING FOR CONTRACTOR COORDINATION  
PURPOSES. TPSS SHALL BE OWNER SUPPLIED  
WHEN AVAILABLE.

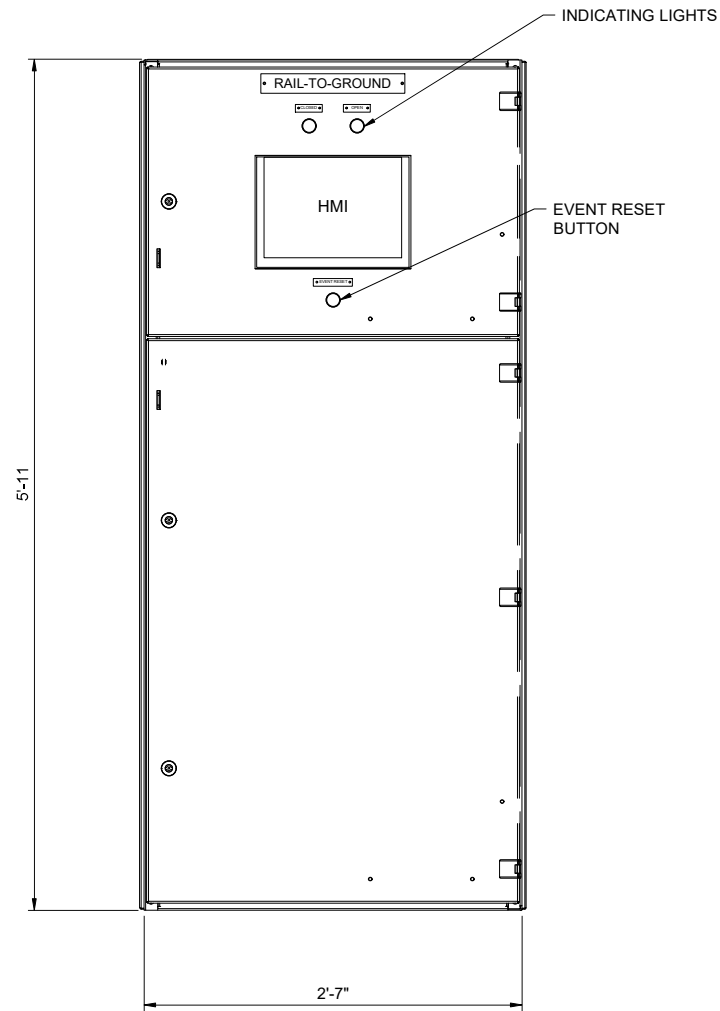
<div>REV</div> <div>DATE</div> <div>DESCRIPTION</div>			<div>DESIGNED BY</div> <div>JDW</div>		<div></div> <div><div>This set of plans is not for construction. These plans are intended to build interest in bidding the project.</div><div>12/22/2022</div></div>	<div>ISSUED FOR BID</div> <div>DATE: 12-23-2022</div>		<div>KANSAS CITY STREETCAR - RIVERFRONT EXTENSION</div>		<div>SCALE FOR 22"x34":</div> <div>NOT TO SCALE</div>		
			<div>CHECKED BY</div> <div>PGL</div>			<div><div>HDR Engineering, Inc.</div><div>The HNTB COMPANIES</div><div>INFRASTRUCTURE SOLUTIONS</div><div>10450 Holmes Road</div><div>Suite 600</div><div>Kansas City, MO 64131-3471</div><div>816-360-2700</div><div>Certificate of Authority: 000856</div></div>		<div><div>HNTB</div><div>The HNTB COMPANIES</div><div>INFRASTRUCTURE SOLUTIONS</div><div>300 Apollo Drive</div><div>Chelmsford, MA 01824</div><div>Phone: 978-905-4000</div><div>Certificate of Authority: 001270</div></div>		<div>FILENAME:</div> <div>J654.DWG</div>		
			<div>DRAWN BY</div> <div>WAC</div>					<div>TRACTION POWER</div>		<div>CONTRACT NO.:</div>		
			<div>CHECKED BY</div> <div>PGL</div>					<div>NEGATIVE AND POSITIVE DISCONNECT SWITCH</div>		<div>CONTRACT NO. ###</div>		
			<div>APPROVED BY</div> <div>NKS</div>					<div>LOGIC DIAGRAM</div>		<div>VOLUME:</div>		
										<div>1</div>		
<div>PLOT DATE: 12/21/2022</div> <div>5:15:30 PM</div>			<div>DATE</div> <div>12/23/2022</div>				<div>NOT FOR CONSTRUCTION</div>		<div>DRAWING NO.:</div> <div>J654</div>		<div>SHEET NO.:</div> <div>154</div>	

- NOTES:
- 1. FOR COORDINATION PURPOSES.
  - 2. SEE SHOP DRAWINGS SUPPLIED BY BUILDING VENDOR VIA OWNER.

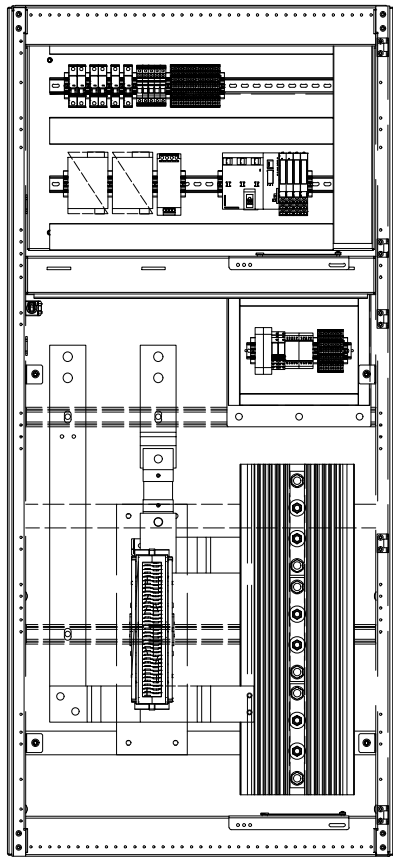


DRAWING FOR CONTRACTOR COORDINATION PURPOSES. TPSS SHALL BE OWNER SUPPLIED WHEN AVAILABLE.

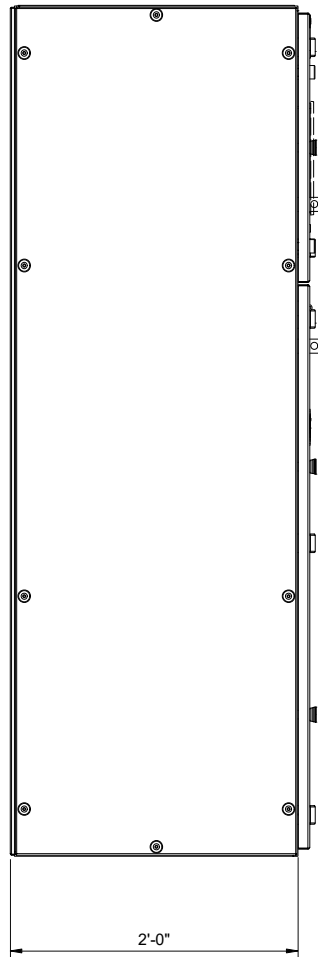
REV	DATE	DESCRIPTION	DESIGNED BY	JDW			ISSUED FOR BID	DATE: 12-23-2022	 HNTB Engineering, Inc. The HNTB COMPANIES INFRASTRUCTURE SOLUTIONS 10450 Holmes Road Suite 600 Kansas City, MO 64131-3471 816-360-2700 Certificate of Authority: 000856	 The HNTB COMPANIES INFRASTRUCTURE SOLUTIONS 300 Apollo Drive Chelmsford, MA 01824 Phone: 978-905-4000 Certificate of Authority: 001270	KANSAS CITY STREETCAR - RIVERFRONT EXTENSION	TRACTION POWER STATION CONTROL CABINET TYPICAL LAYOUT	SCALE FOR 22"x34": NOT TO SCALE		
			CHECKED BY	PGL									FILENAME: J660.DWG		
			DRAWN BY	JDW									CONTRACT NO.: CONTRACT NO. ###		
			CHECKED BY	PGL									VOLUME: 1		
			APPROVED BY	NKS									DRAWING NO.: J660		
PLOT DATE: 12/21/2022			5:15:37 PM		DATE	12/23/2022	NOT FOR CONSTRUCTION						SHEET NO.: 155		



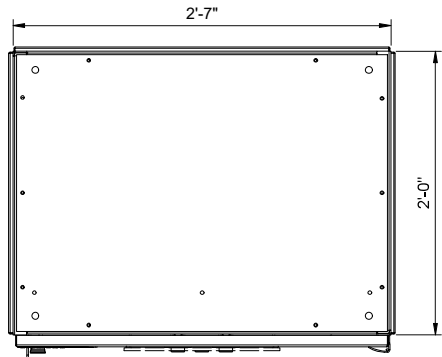
FRONT VIEW  
SCALE: NOT TO SCALE



FRONT VIEW  
(WITHOUT DOORS AND TRUCK)  
SCALE: NOT TO SCALE



SIDE VIEW  
SCALE: NOT TO SCALE



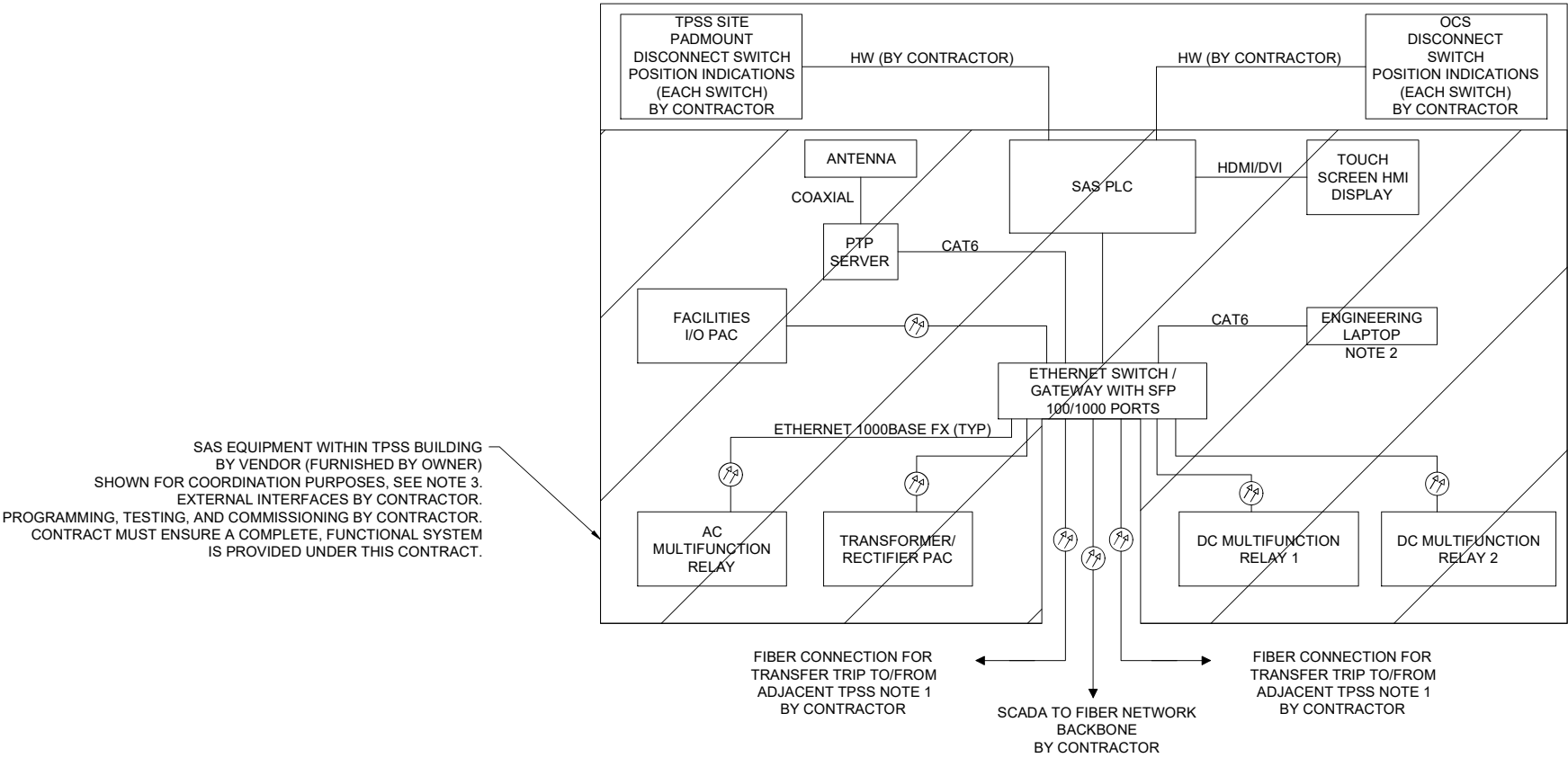
TOP VIEW  
SCALE: NOT TO SCALE

- NOTES:
- 1. FOR COORDINATION PURPOSES.
  - 2. SEE SHOP DRAWINGS SUPPLIED BY BUILDING VENDOR VIA OWNER.

DRAWING FOR CONTRACTOR COORDINATION PURPOSES. TPSS SHALL BE OWNER SUPPLIED WHEN AVAILABLE.

REV			DATE		DESCRIPTION		DESIGNED BY		JDW				ISSUED FOR BID				DATE: 12-23-2022				KANSAS CITY STREETCAR - RIVERFRONT EXTENSION				SCALE FOR 22"x34": NOT TO SCALE			
							CHECKED BY		PGL				 HDR Engineering, Inc. 10450 Holmes Road Suite 600 Kansas City, MO 64131-3471 816-360-2700 Certificate of Authority: 000856				 The HNTB COMPANIES INFRASTRUCTURE SOLUTIONS 300 Apollo Drive Chelmsford, MA 01824 Phone: 978-905-4000 Certificate of Authority: 001270											
							DRAWN BY		JDW																			
							CHECKED BY		PGL																			
							APPROVED BY		NKS																			
PLOT DATE: 12/21/2022						5:15:55 PM						DATE		12/23/2022		NOT FOR CONSTRUCTION								DRAWING NO.: J661		SHEET NO.: 156		

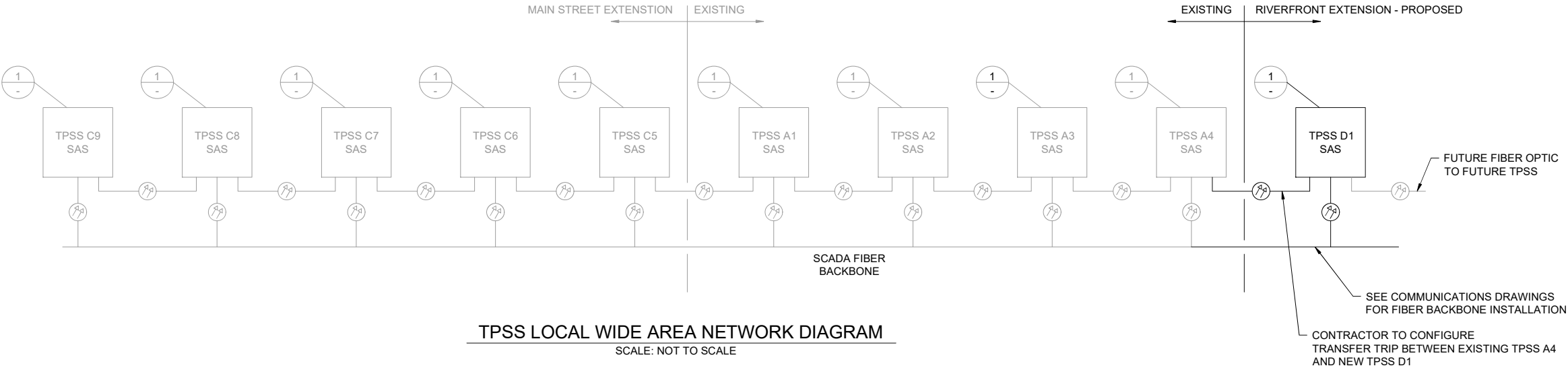




SAS EQUIPMENT WITHIN TPSS BUILDING BY VENDOR (FURNISHED BY OWNER) SHOWN FOR COORDINATION PURPOSES, SEE NOTE 3. EXTERNAL INTERFACES BY CONTRACTOR. PROGRAMMING, TESTING, AND COMMISSIONING BY CONTRACTOR. CONTRACT MUST ENSURE A COMPLETE, FUNCTIONAL SYSTEM IS PROVIDED UNDER THIS CONTRACT.

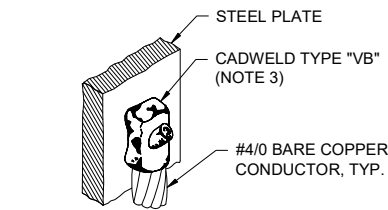
- NOTES:
- 1. CONTRACTOR SHALL CONFIGURE TRANSFER TRIP FUNCTION BETWEEN ADJACENT TPSS DC MULTIFUNCTION RELAYS USING THE COMMUNICATIONS SYSTEM FOR FIBER OPTIC CONNECTION. SEE SPECIFICATIONS FOR ADDITIONAL DETAILS.
  - 2. PROVIDE ONE ENGINEERING LAPTOP PER THE SPECIFICATIONS (BY BUILDING VENDOR).
  - 3. SHOP DRAWINGS SHALL BE PROVIDED BY THE BUILDING VENDOR VIA OWNER WHEN AVAILABLE.

TYPICAL TPSS SAS LOCAL AREA NETWORK DIAGRAM 1  
SCALE: NOT TO SCALE

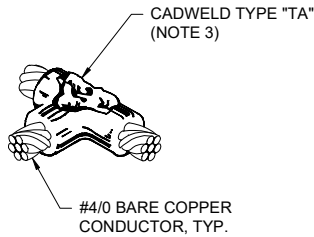


TPSS LOCAL WIDE AREA NETWORK DIAGRAM  
SCALE: NOT TO SCALE

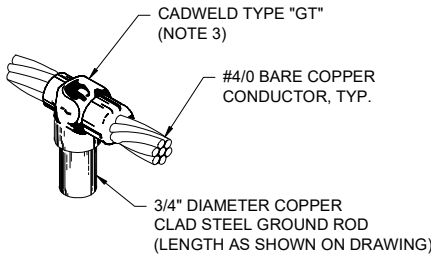
REV	DATE	DESCRIPTION	DESIGNED BY	JDW		<div>This set of plans is not for construction. These plans are intended to build interest in bidding the project.</div>	ISSUED FOR BID	DATE: 12-23-2022	<b>KANSAS CITY STREETCAR - RIVERFRONT EXTENSION</b>	SCALE FOR 22"x34": NOT TO SCALE			
			CHECKED BY	PGL									
			DRAWN BY	JDW									
			CHECKED BY	PGL									
			APPROVED BY	NKS									
PLOT DATE: 12/21/2022			5:16:19 PM		DATE		12/23/2022		NOT FOR CONSTRUCTION		TRACTION POWER TPSS COMMUNICATIONS BLOCK DIAGRAM		
									DRAWING NO.: <b>J665</b>		SHEET NO.: <b>157</b>		



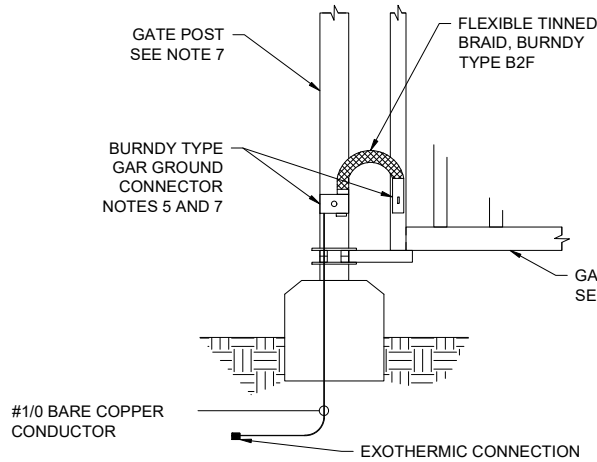
STEEL PLATE CONNECTION 1  
SCALE: NOT TO SCALE



GROUND CONDUCTOR TEE CONNECTION 2  
SCALE: NOT TO SCALE

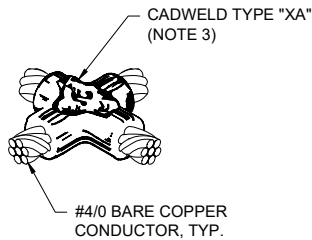


GROUND ROD CONNECTION 3  
SCALE: NOT TO SCALE

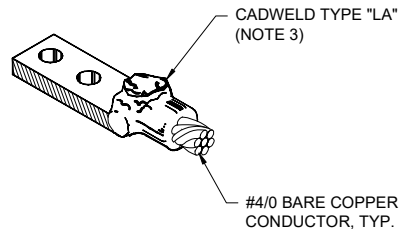


GATE GROUNDING CONNECTION 11  
SCALE: NOT TO SCALE

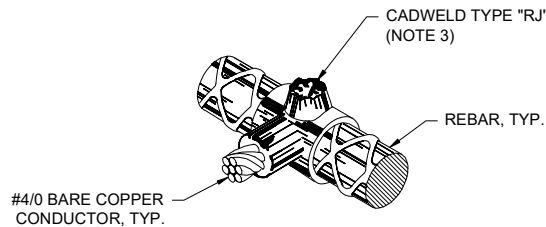
- NOTES:
- GROUND CONDUCTOR "TEE" CONNECTIONS SHALL BE USED AT ALL GROUND GRID INTERSECTIONS AROUND THE PERIMETER OF THE GROUND GRID.
  - GROUND CONDUCTOR "CROSS" CONNECTIONS SHALL BE USED AT ALL GROUND GRID INTERSECTIONS WITHIN THE PERIMETER OF THE GROUND GRID.
  - CADWELD TYPE CONNECTIONS LISTED FOR REFERENCE ONLY AND DOES NOT PRECLUDE ANY OTHER MANUFACTURER.
  - DRILL AND TAP FOR 2-HOLE NEMA LUGS.
  - COMPRESSION TYPE GROUND CONNECTIONS ARE ACCEPTABLE WHERE NOT IN CONTACT WITH GROUND/EARTH. BURNDY OR APPROVED EQUAL.
  - PRE-DRILL COPPER BUSBAR FOR NEMA 2 HOLE LUGS.
  - FOR VINYL COATED FENCING, REMOVE COATING AND CLEAN SURFACE PRIOR TO MAKING GROUNDING CONNECTIONS. AFTER MAKING CONNECTIONS, COAT EXPOSED FENCE POST SURFACE AND CONNECTIONS WITH A ZINC RICH PAINT.



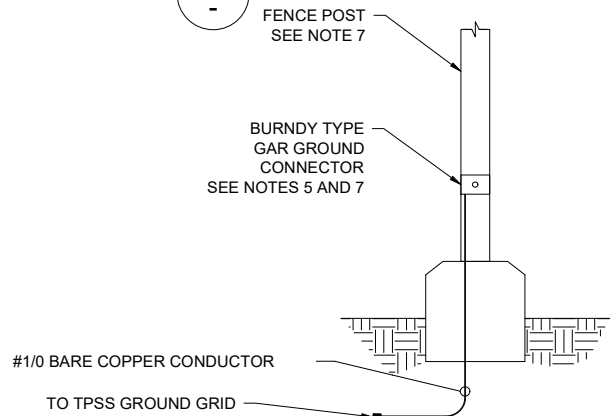
GROUND CONDUCTOR CROSS CONNECTION 4  
SCALE: NOT TO SCALE



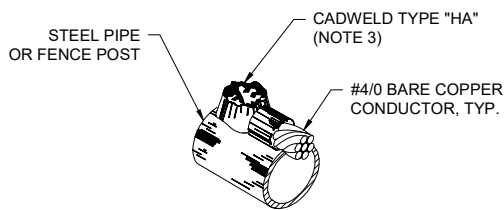
GROUND CONDUCTOR TO 2-HOLE TERMINAL CONNECTION 5  
SCALE: NOT TO SCALE



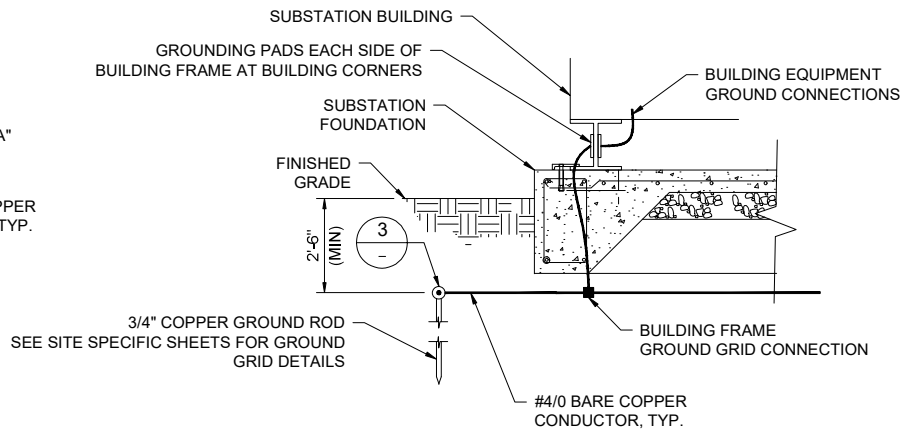
GROUND CONDUCTOR TO REBAR CONNECTION 6  
SCALE: NOT TO SCALE



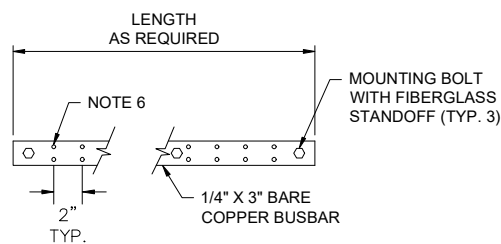
FENCE POST GROUNDING CONNECTION 12  
SCALE: NOT TO SCALE



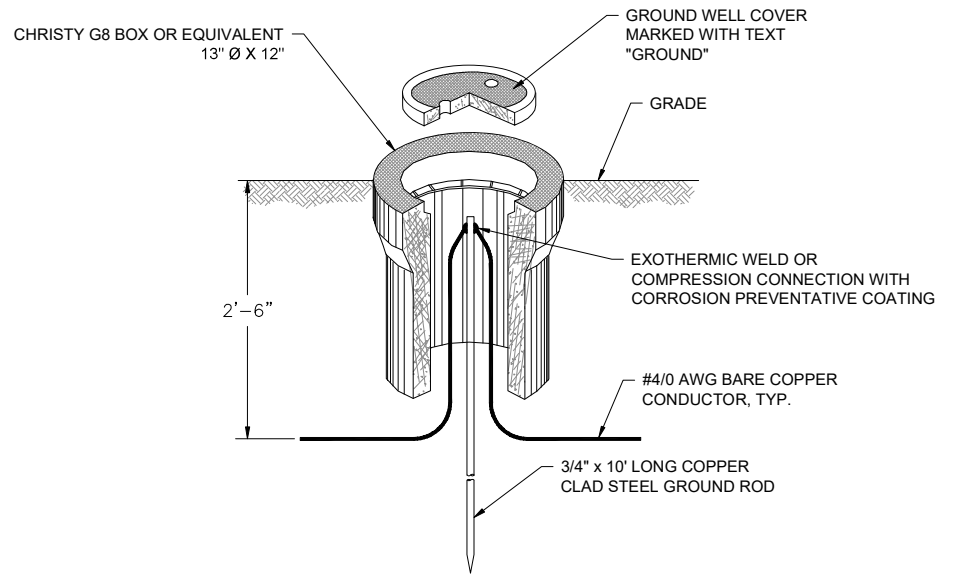
GROUND CONDUCTOR TP STEEL PIPE CONNECTION 7  
SCALE: NOT TO SCALE



GROUNDING MAT DETAIL 8  
SCALE: NOT TO SCALE



TYPICAL GROUND BUSBAR 9  
SCALE: NOT TO SCALE



GROUND WELL DETAIL 10  
SCALE: NOT TO SCALE

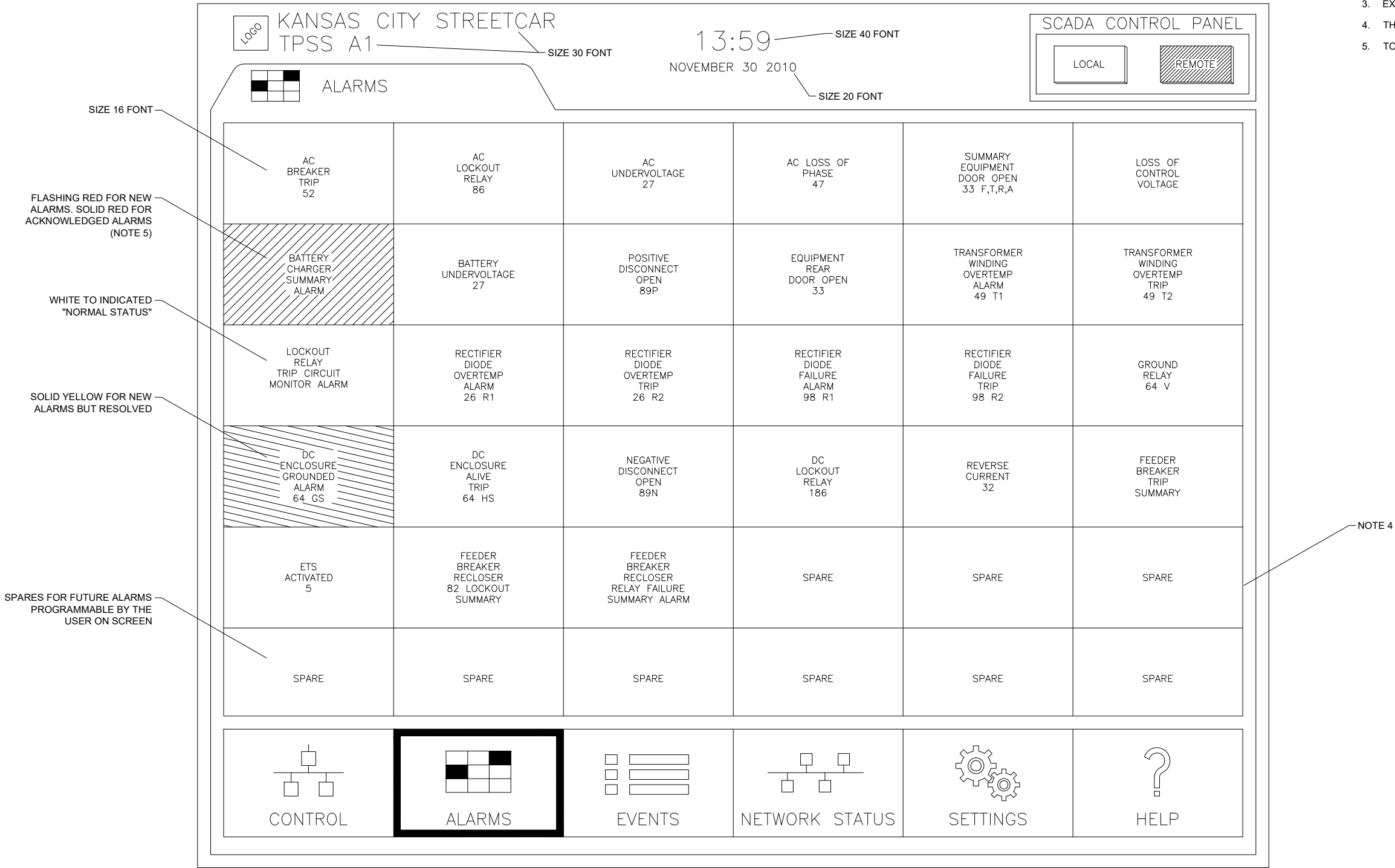
REV	DATE	DESCRIPTION	DESIGNED BY	JDW			ISSUED FOR BID	DATE: 12-23-2022	<b>KANSAS CITY STREETCAR - RIVERFRONT EXTENSION</b>	SCALE FOR 22"x34": NOT TO SCALE	
			CHECKED BY	PGL			 HNTB Engineering, Inc.	The HNTB COMPANIES INFRASTRUCTURE SOLUTIONS 10450 Holmes Road Suite 600 Kansas City, MO 64131-3471 816-360-2700 Certificate of Authority: 000856		300 Apollo Drive Chelmsford, MA 01824 Phone: 978-905-4000 Certificate of Authority: 001270	FILENAME:
			DRAWN BY	JDW							CONTRACT NO.:
			CHECKED BY	PGL							CONTRACT NO. ###
			APPROVED BY	NKS							VOLUME:
PLOT DATE: 12/21/2022			5:16:53 PM		DATE	12/23/2022	NOT FOR CONSTRUCTION		DRAWING NO.:	SHEET NO.:	
									J673	158	

NOTES:  
1. SEE SHEET J630 FOR TPSS D1 SITE RACEWAY LAYOUT.

TPSS D1 - CONDUCTOR SCHEDULE											
FEEDER NUMBER	FROM	TO	VIA DUCTBANK/CONDUIT	DUCTBANK SECTION	CABLE DESCRIPTION					DRAWING NUMBER	COMMENTS
					QUANTITY	SIZE	TYPE	VOLTAGE RATING	TEMPERATURE RATING		
D1-PF1	D1-F1	D1-DS1	TPD-D1P1	2A / C404	2	250 KCMIL	EPR	2000 V	90° C	J630	POSITIVE FEEDER
	D1-DS1	TE-MH-D101	TPD-D1P5	2A / C404 10A / C404	2	250 KCMIL	EPR	2000 V	90° C	J630	
	TE-MH-D101	OCS FEEDER POLE R/34 (SB)			2	250 KCMIL	EPR	2000 V	90° C		SEE SYSTEMWIDE ELECTRICAL PLAN
D1-PF2	D1-F1	D1-DS2	TPD-D1P2	2A / C404	2	250 KCMIL	EPR	2000 V	90° C	J630	POSITIVE FEEDER
	D1-DS2	TE-MH-D101	TPD-D1P6	2A / C404 10A / C404	2	250 KCMIL	EPR	2000 V	90° C	J630	
	TE-MH-D101	OCS FEEDER POLE R/33 (NB)			2	250 KCMIL	EPR	2000 V	90° C		SEE SYSTEMWIDE ELECTRICAL PLAN
D1-PF3	D1-F2	D1-DS3	TPD-D1P3	2A / C404	2	250 KCMIL	EPR	2000 V	90° C	J630	POSITIVE FEEDER
	D1-DS3	TE-MH-D101	TPD-D1P7	2A / C404 10A / C404	2	250 KCMIL	EPR	2000 V	90° C	J630	
	TE-MH-D101	OCS FEEDER POLE R/34 (SB)			2	250 KCMIL	EPR	2000 V	90° C		SEE SYSTEMWIDE ELECTRICAL PLAN
D1-PF4	D1-F2	D1-DS4	TPD-D1P4	2A / C404	2	250 KCMIL	EPR	2000 V	90° C	J630	POSITIVE FEEDER
	D1-DS4	TE-MH-D101	TPD-D1P8	2A / C404 10A / C404	2	250 KCMIL	EPR	2000 V	90° C	J630	
	TE-MH-D101	OCS FEEDER POLE R/33 (NB)			2	250 KCMIL	EPR	2000 V	90° C		SEE SYSTEMWIDE ELECTRICAL PLAN
D1-NR1	DC NEGATIVE BUS	TE-MH-D102	TPD-D1N1	4A / C404	4	250 KCMIL	EPR	2000 V	90° C	J630	NEGATIVE RETURN
	TE-MH-D102	TRACK BLOCKOUT (SB)			4	250 KCMIL	EPR	2000 V	90° C		SEE SYSTEMWIDE ELECTRICAL PLAN
D1-NR2	DC NEGATIVE BUS	TE-MH-D102	TPD-D1N1	4A / C404	4	250 KCMIL	EPR	2000 V	90° C	J630	NEGATIVE RETURN
	TE-MH-D102	TRACK BLOCKOUT (NB)			4	250 KCMIL	EPR	2000 V	90° C		SEE SYSTEMWIDE ELECTRICAL PLAN
D1-HV1	FUSED LOAD BREAK FUSED /METERING CABINET	LOCAL UTILITY SECTIONALIZER SWITCHGEAR	TPD-D1U1	2A / C404	BY LOCAL UTILITY	BY LOCAL UTILITY	BY LOCAL UTILITY	BY LOCAL UTILITY	BY LOCAL UTILITY	J630	COORDINATE CABLE AND DUCTBANK REQUIREMENTS WITH LOCAL UTILITY
D1-HV2	LOCAL UTILITY SECTIONALIZER SWITCHGEAR	LOCAL UTILITY MANHOLE / SPLICE	TPD-D1U2	2A / C404	BY LOCAL UTILITY	BY LOCAL UTILITY	BY LOCAL UTILITY	BY LOCAL UTILITY	BY LOCAL UTILITY	J630	COORDINATE CABLE AND DUCTBANK REQUIREMENTS WITH LOCAL UTILITY
D1-SS1	HMI PAC I/O MODULE	D1-DS1, D1-DS2, D1-DS3, D1-DS4, D1-DS5, D1-DS6 OPEN/CLOSE AUX CONTACTS	TPD-D1S1	2B / C404	2	12/C - #12 AWG	XLPE	600 V	90° C	J630	SWITCH STATUS INDICATIONS
FIBER	COMMUNICATIONS RACK	FIBER BACKBONE SEE COMMUNICATIONS PLANS	TPD-D1C1	2B / C404 4C / C404	SEE COMMUNICATIONS PLANS	SEE COMMUNICATIONS PLANS	SEE COMMUNICATIONS PLANS	SEE COMMUNICATIONS PLANS	SEE COMMUNICATIONS PLANS	SEE COMMUNICATIONS PLANS	SEE COMMUNICATIONS PLANS

REV	DATE	DESCRIPTION	DESIGNED BY	JDW			ISSUED FOR BID		DATE: 12-23-2022	 The HNTB COMPANIES INFRASTRUCTURE SOLUTIONS 10450 Holmes Road Suite 600 Kansas City, MO 64131-3471 816-360-2700 Certificate of Authority: 000856	 The HNTB COMPANIES INFRASTRUCTURE SOLUTIONS 300 Apollo Drive Chelmsford, MA 01824 Phone: 978-905-4000 Certificate of Authority: 001270	KANSAS CITY STREETCAR - RIVERFRONT EXTENSION		SCALE FOR 22"x34": NOT TO SCALE		
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			CHECKED BY	PGL								CONTRACT NO.:				
			APPROVED BY	NKS								CONTRACT NO. ###				
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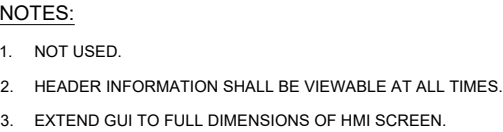
- NOTES:
- 1. NOT USED.
  - 2. HEADER INFORMATION SHALL BE VIEWABLE AT ALL TIMES.
  - 3. EXTEND GUI TO FULL DIMENSIONS OF HMI SCREEN.
  - 4. THERE SHALL BE A MINIMUM OF 36 WINDOWS.
  - 5. TOUCH WINDOW TO ACKNOWLEDGE ALARMS.



DRAWING FOR CONTRACTOR COORDINATION PURPOSES. TPSS SHALL BE OWNER SUPPLIED WHEN AVAILABLE.

REV	DATE	DESCRIPTION	DESIGNED BY	JDW			ISSUED FOR BID		DATE: 12-23-2022	KANSAS CITY STREETCAR - RIVERFRONT EXTENSION		SCALE FOR 22"x34": NOT TO SCALE		
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			CHECKED BY	PGL							SCREEN LAYOUT		CONTRACT NO. ###	
			APPROVED BY	NKS									VOLUME: 1	
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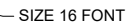




DRAWING FOR CONTRACTOR  
COORDINATION PURPOSES. TPSS SHALL  
BE OWNER SUPPLIED WHEN AVAILABLE.

REV	DATE	DESCRIPTION	DESIGNED BY	JDW	 <div>This set of plans is not for construction. These plans are intended to build interest in bidding the project.</div>	ISSUED FOR BID		DATE: 12-23-2022	<div>KANSAS CITY STREETCAR - RIVERFRONT EXTENSION</div> <div>TRACTION POWER TYPICAL TPSS HMI CONTROL SCREEN LAYOUT</div>		SCALE FOR 22"x34": NOT TO SCALE	
			CHECKED BY	PGL		<div><div>HDR Engineering, Inc.</div><div>10450 Holmes Road Suite 600 Kansas City, MO 64131-3471 816-360-2700 Certificate of Authority: 000856</div></div> <div><div><div>The HNTB COMPANIES INFRASTRUCTURE SOLUTIONS</div><div>300 Apollo Drive Chelmsford, MA 01824 Phone: 978-905-4000 Certificate of Authority: 001270</div></div></div>					FILENAME:	
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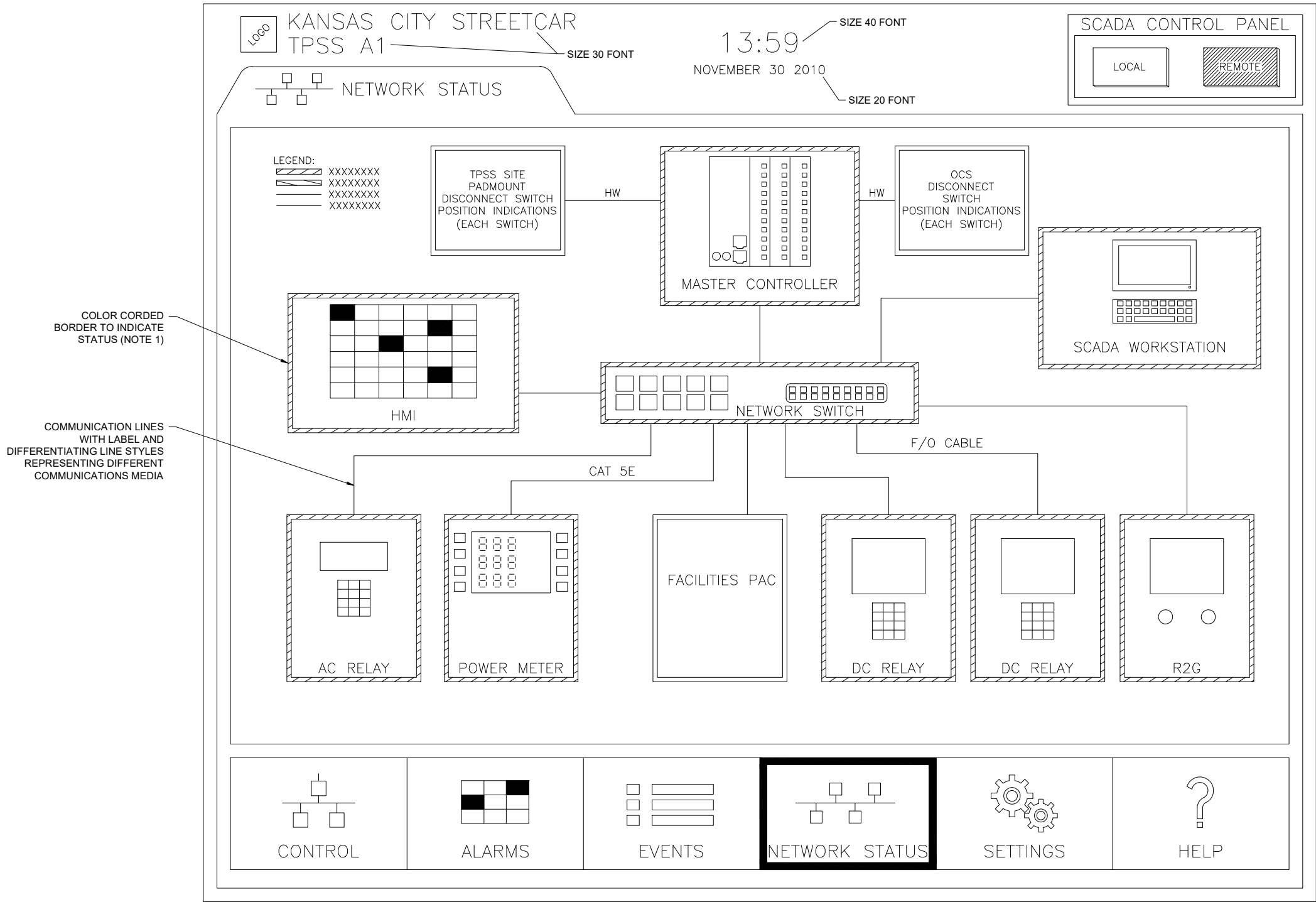
1. NOT USED.
2. HEADER INFORMATION SHALL BE VIEWABLE AT ALL TIMES.
3. EXTEND GUI TO FULL DIMENSIONS OF HMI SCREEN.



## 2 KANSAS CITY STREETCAR - RIVERFRONT EXTENSION

302994

- NOTES:
- 1. NOT USED.
  - 2. HEADER INFORMATION SHALL BE VIEWABLE AT ALL TIMES.
  - 3. EXTEND GUI TO FULL DIMENSIONS OF HMI SCREEN.



DRAWING FOR CONTRACTOR COORDINATION PURPOSES. TPSS SHALL BE OWNER SUPPLIED WHEN AVAILABLE.

<table><tr><td>REV</td><td>DATE</td><td>DESCRIPTION</td></tr><tr><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td></tr><tr><td colspan="3">PLOT DATE: 12/21/2022 5:17:37 PM</td></tr></table>			REV	DATE	DESCRIPTION																PLOT DATE: 12/21/2022 5:17:37 PM			<table><tr><td>DESIGNED BY</td><td>JDW</td></tr><tr><td>CHECKED BY</td><td>PGL</td></tr><tr><td>DRAWN BY</td><td>JDW</td></tr><tr><td>CHECKED BY</td><td>PGL</td></tr><tr><td>APPROVED BY</td><td>NKS</td></tr><tr><td>DATE</td><td>12/23/2022</td></tr></table>	DESIGNED BY	JDW	CHECKED BY	PGL	DRAWN BY	JDW	CHECKED BY	PGL	APPROVED BY	NKS	DATE	12/23/2022	<div><div><div>This set of plans is not for construction. These plans are intended to build interest in bidding the project.</div><div>12/22/2022</div></div></div>	<table><tr><td>ISSUED FOR BID</td><td>DATE: 12-23-2022</td></tr><tr><td><div><div>HDR Engineering, Inc.</div><div>10450 Holmes Road Suite 600 Kansas City, MO 64131-3471 816-360-2700 Certificate of Authority: 000856</div></div></td><td><div><div>The HNTB COMPANIES INFRASTRUCTURE SOLUTIONS 300 Apollo Drive Chelmsford, MA 01824 Phone: 978-905-4000 Certificate of Authority: 001270</div></div></td></tr><tr><td colspan="2">NOT FOR CONSTRUCTION</td></tr></table>	ISSUED FOR BID	DATE: 12-23-2022	<div><div>HDR Engineering, Inc.</div><div>10450 Holmes Road Suite 600 Kansas City, MO 64131-3471 816-360-2700 Certificate of Authority: 000856</div></div>	<div><div>The HNTB COMPANIES INFRASTRUCTURE SOLUTIONS 300 Apollo Drive Chelmsford, MA 01824 Phone: 978-905-4000 Certificate of Authority: 001270</div></div>	NOT FOR CONSTRUCTION		<div><div>KANSAS CITY STREETCAR - RIVERFRONT EXTENSION</div><div>TRACTION POWER TYPICAL TPSS HMI NETWORK STATUS SCREEN LAYOUT</div></div>	<table><tr><td colspan="2">SCALE FOR 22"x34": NOT TO SCALE</td></tr><tr><td colspan="2">FILENAME: J690-J693.DWG</td></tr><tr><td colspan="2">CONTRACT NO.: CONTRACT NO. ###</td></tr><tr><td colspan="2">VOLUME: 1</td></tr><tr><td>DRAWING NO.: J693</td><td>SHEET NO.: 163</td></tr></table>	SCALE FOR 22"x34": NOT TO SCALE		FILENAME: J690-J693.DWG		CONTRACT NO.: CONTRACT NO. ###		VOLUME: 1		DRAWING NO.: J693	SHEET NO.: 163
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CIP CONCRETE NOTES:

1. REFER TO THE PROJECT SPECIFICATIONS FOR CONCRETE WORK SHOWN ON THIS SHEET.
2. MINIMUM 28 DAY CAST-IN-PLACE CONCRETE COMPRESSIVE STRENGTH SHALL BE 3,000 PSI, WITH 3/4" MAXIMUM AGGREGATE SIZE.
3. THE FOLLOWING MINIMUM COVER SHALL BE PROVIDED FOR REINFORCING BARS UNLESS SHOWN OTHERWISE ON THE DRAWINGS:

CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH: 3"

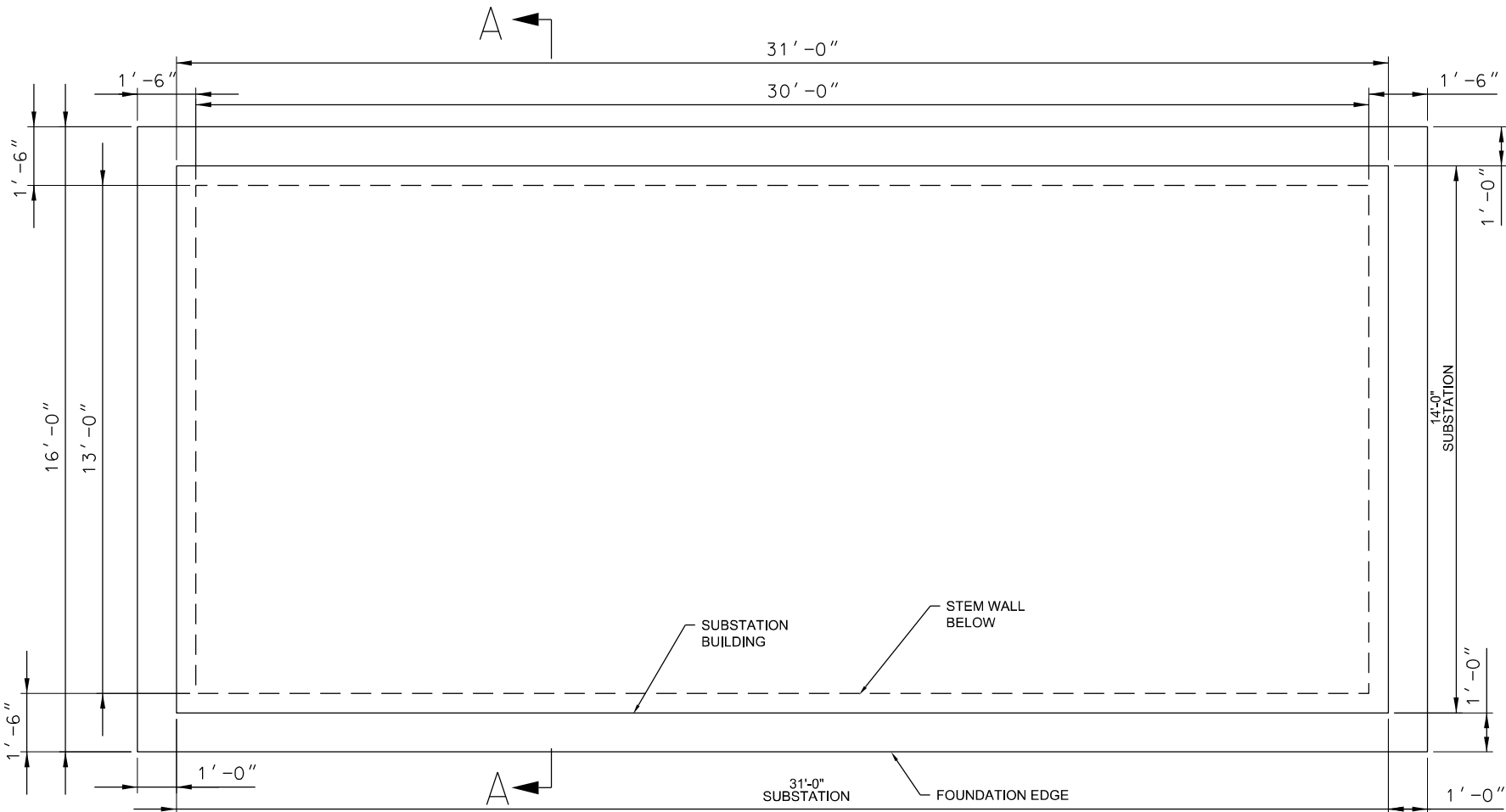
CONCRETE EXPOSED TO EARTH OR WEATHER: 2"
4. PROVIDE 3/4" CHAMFERED EDGE AT ALL EXPOSED CONCRETE CORNERS AND JOINTS. NOT ALL CHAMFERS MAY BE SHOWN ON THE DRAWING.
5. CONCRETE SHALL BE CAST MONOLITHIC UNLESS SPECIFICALLY NOTED OTHERWISE.
6. COORDINATE FINAL DIMENSIONS OF THE FOUNDATION SLAB AND LOCATION OF CONDUIT STUB-UPS AND GROUNDING PIGTAILS WITH SUBSTATION PROCUREMENT CONTRACTOR.
7. CONFIRM ALL SKID DIMENSIONS WITH ENGINEER PRIOR TO CONSTRUCTION OF CONCRETE SLAB.
8. TOP OF SLAB SHALL BE SLOPED 1/8" FROM CENTER OF SLAB TO EACH CORNER TO PREVENT STANDING WATER. REFER TO CIVIL PLANS FOR GRADING AND SLOPE AROUND THE TPSS FOUNDATIONS.
9. CONCRETE SHALL BE TROWELLED TO SMOOTH FINISH.
10. ANCHORS SHALL BE OF A REPUTABLE MANUFACTURER SUCH AS HILTI, SIMPSON, OR SIKA, AND BE DESIGNED BASED ON CURRENT DESIGN STANDARDS (SEE ACI 318 APPENDIX D) FOR THE INTENDED USAGE AND CONDITIONS. ALL EXPANSION AND ADHESIVE ANCHORS SHALL HAVE THE ICC REPORT SHOWING EQUIVALENT LOAD CAPACITY. SUBMIT AND INSTALL PER THE ICC EVALUATION REPORT. FOLLOW MANUFACTURER'S REQUIREMENTS FOR APPLICATION, CLEANING AND INSTALLATION. SEE PROJECT SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
11. WHEN DRILLING HOLES FOR DOWELS, NO EXISTING REINFORCING BAR SHALL BE CUT. CONTRACTOR SHALL FILL ALL UNSUCCESSFUL HOLES WITH EPOXY PRIOR TO CASTING CONCRETE.

TPSS FOUNDATION NOTES:

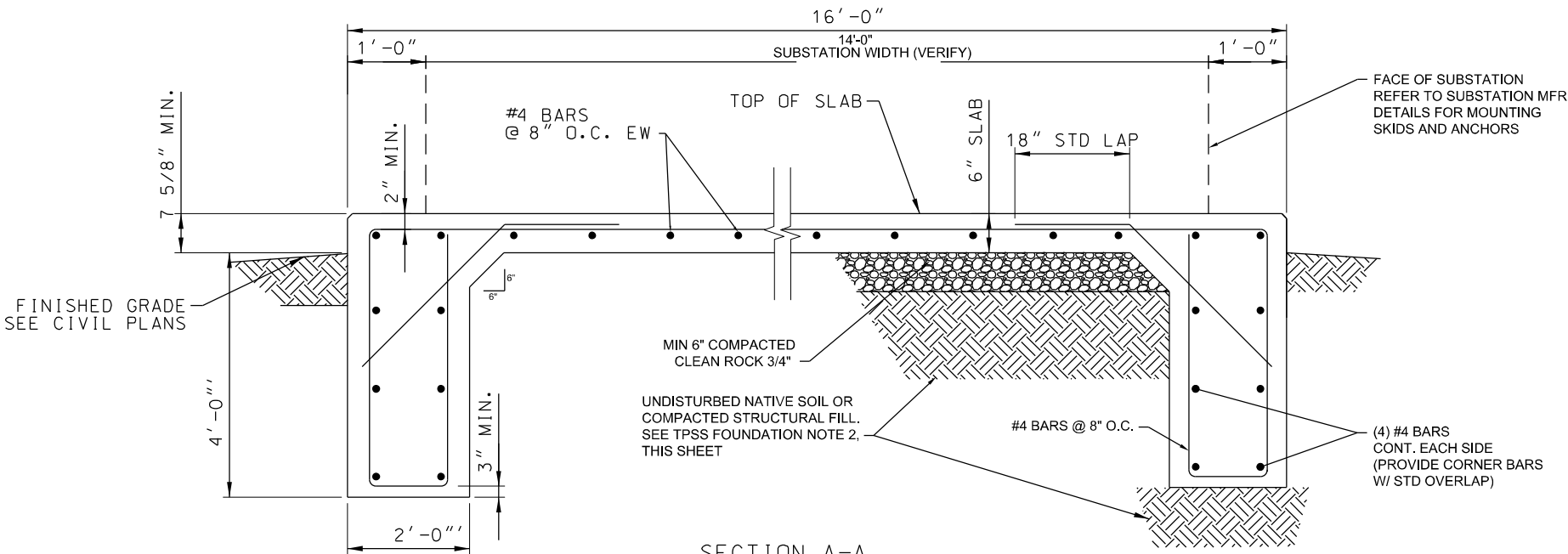
1. THE FOLLOWING DESIGN PARAMETERS ARE BASED ON THE GEOTECHNICAL REPORT KANSAS CITY RIVERFRONT STREETCAR EXTENSION PROVIDED BY TSi GEOTECHNICAL INC. DATED JULY 27, 2022:

1.1.MIN. SOIL BEARING PRESSURE 1500 PSF

1.2.FOOTING FROST DEPTH 3'-0"
2. TPSS FOUNDATIONS SHALL BE BEARING ENTIRELY ON NEW STRUCTURAL FILL OR NATIVE SOILS THAT MEET REQUIREMENTS IN THE SPECIFICATIONS AND GEOTECHNICAL REPORT CAPABLE OF MINIMUM 1500 PSF BEARING PRESSURE.
3. IF EXISTING UNDOCUMENTED FILL IS ENCOUNTERED AT THE FOUNDATION SUBGRADE, IT SHOULD BE REMOVED AND REPLACED WITH PROPERLY COMPACTED FILL MATERIAL AS DEFINED IN PROJECT SPECIFICATIONS.
4. DUCTBANKS SHALL NOT PENETRATE THROUGH THE STEM WALL.



TPSS FOUNDATION - PLAN 1



SECTION A-A

REV	DATE	DESCRIPTION	DESIGNED BY	MM			ISSUED FOR BID		DATE: 12-23-2022		KANSAS CITY STREETCAR - RIVERFRONT EXTENSION		SCALE FOR 22"x34":		
			CHECKED BY	PY			 HDR Engineering, Inc.		 Tallaferrro & Browne, Inc.				NOT TO SCALE		
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			APPROVED BY	NKS							CONTRACT NO. ***				
PLOT DATE: 12/23/2022			9:56:29 AM		DATE		12-23-2022						VOLUME:		
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