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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

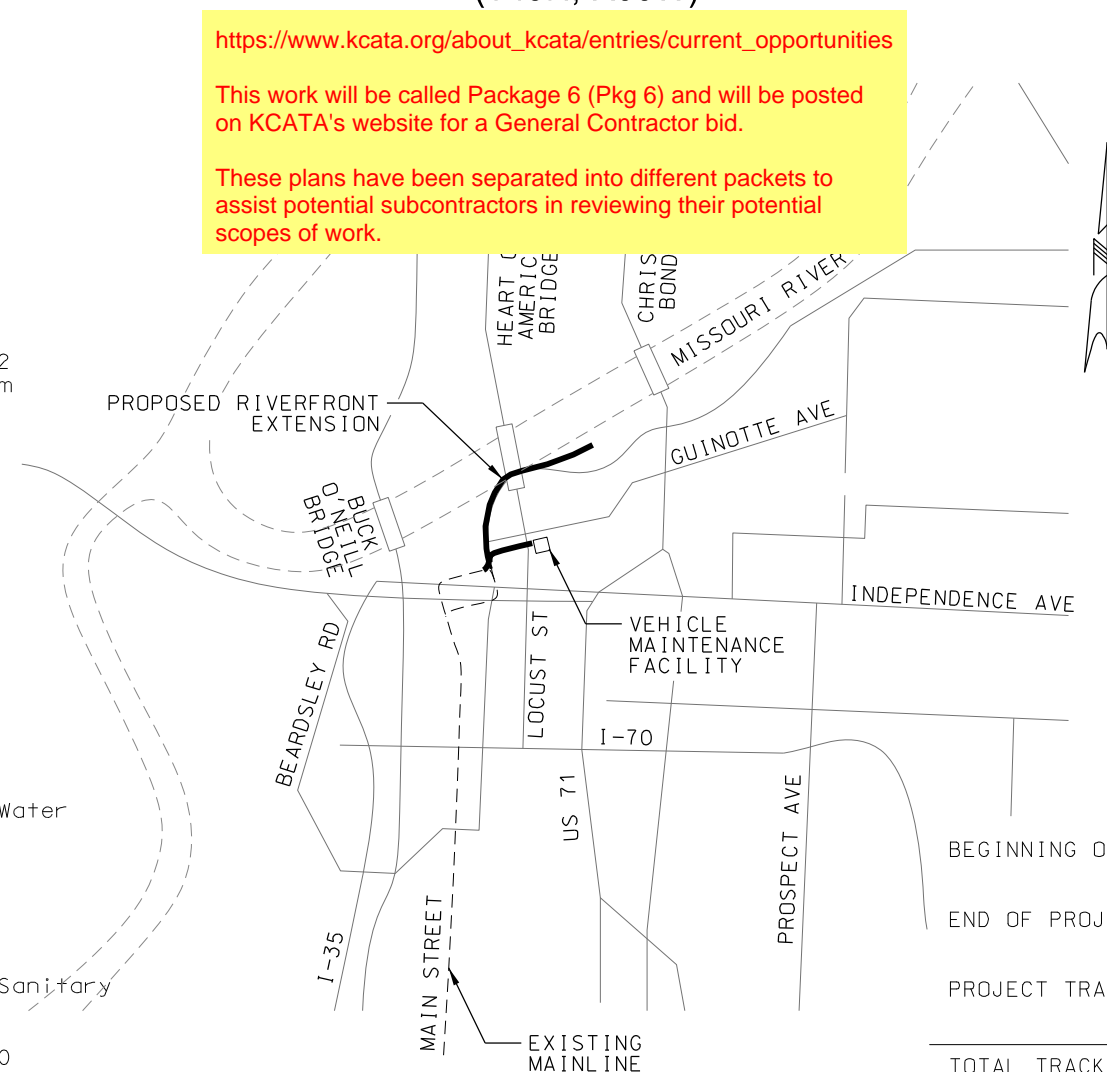
PORT AUTHORITY OF KANSAS CITY, MISSOURI
(PORT KC)

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.: G001	SHEET NO.: 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 PROFILE 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	WAY FINDING 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	KANSAS CITY STREETCAR - RIVERFRONT EXTENSION		SCALE FOR 22"x34":		
			CHECKED BY	JWR				NOT TO SCALE			FILENAME:		
			DRAWN BY	MMO							G011.dgn		
			CHECKED BY	JWR							CONTRACT NO.:		
			APPROVED BY	NKS							CONTRACT NO. ***		
PLOT DATE: \$DATE\$			\$TIME\$	DATE	I2-23-2022		NOT FOR CONSTRUCTION		INDEX OF DRAWINGS SHEET 2		VOLUME:		
											DRAWING NO.:		
											SHEET NO.:		
											G011		
											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":		
			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>	NOT FOR CONSTRUCTION			NOT TO SCALE		
			DRAWN BY	MMO						FILENAME:		
			CHECKED BY	JWR						G013.dgn		
			APPROVED BY	NKS						CONTRACT NO.:		
										CONTRACT NO. ***		
										VOLUME:		
										1		
PLOT DATE: \$DATE\$		\$TIME\$	DATE	12-23-2022				INDEX OF DRAWINGS		DRAWING NO.:	SHEET NO.:	
								SHEET 4		G013	5	

GENERAL NOTES

- 1) The Contractor shall stake the locations of all poles, pull boxes, controller and other equipment. Staked locations shall be reviewed by the City Inspector for approval prior to placement of equipment.
- 2) All locations indicated in drawings, including conduit runs are subject to adjustment to clear obstructions, avoid utilities, and to meet site conditions, if any, by the City Inspector.
- 3) Work and equipment shall meet the latest edition of the City of Kansas City, Mo. specifications and the project specific technical specificaltions. Where Missouri standard specifications are referred to, it shall mean the latest edition.
- 4) Any equipment damaged during construction shall be replaced at the contractor's expense.
- 5) Combination OCS, lighting and signal poles shall have a separate 2" conduit stubbed out of the pole base for the OCS and lighting systems conductors to be installed.
- 6) All signal indications shall be 12" LEDs per ITE specifications.
- 7) All pedestrian signal indications shall be 16 inch LED countdown PED modules with walker and hand symbols. Filled indication type per ITE specifications.
- 8) All mast arm mounted signal heads shall have back plates.
- 9) Existing signals shall remain in operation until new signals are installed. Signal foundations shall be removed 2 ft below grade. All removed signal and lighting appurtenances not being reused shall be returned to the Public Works Traffic Signal Section.
- 10) All street cuts and restoration to follow City Street Cut Restoration specifications and drawing SR-1.
- 11) Standard concrete mixes, unless otherwise specified shall be:

a) Bases – MCIB air-entrained mix no. A-629-1/2-2.
- 12) All disturbed surfaces shall match the existing surface elevation.
- 13) Signal equipment shall not form an obstruction to the movement of pedestrian and wheelchair traffic. Where sidewalks are present, a minimum clear width of 48 inches shall be available for pedestrian and wheelchair movement.
- 14) Right-Of-Way limits should be cross checked by the contractor and approved by the field inspector before undertaking any excavations at the site.
- 15) Existence and location of any underground facilities shown on these drawings or reference to any soil conditions, if made, are for information only. It is the contractor's / bidder's responsibility to verify all site conditions and to locate all utilities before starting the project.
- 16) The contractor is fully responsible for any and all damages caused by failure to exactly locate and preserve all utilities.
- 17) Quantities shown are estimations based on plans. Payment will be made by measurement of actual work done.
- 18) Unless otherwise called for, luminaire arms, where used, shall be oriented parallel to signal mast arms.
- 19) Conduits may be bored under existing pavements, unless authorized otherwise by the City Inspector.
- 20) Pull boxes shall not be installed on wheelchair ramps.
- 21) Conflict monitors shall be ethernet capable and shall be provided with cables for remote access.
- 22) Accessible pedestrian signals shall meet MUTCD, PROWAG and ADA requirements. Refer to the project specific technical special provisions for additional requirements.
- 23) All traffic signal equipment and LED internally illuminated street name sign shop drawings shall be submitted to Sol Moinuddin, Public Works, and Traffic Operations at sol.moinuddin@kcmo.org, 1-816-513-9863.
- 24) All signs on signal poles and mast-arms are incidental to traffic signal installation, contractors will not be paid separately.

TRAFFIC SIGNAL GENERAL NOTES

GENERAL NOTES CONTINUED:

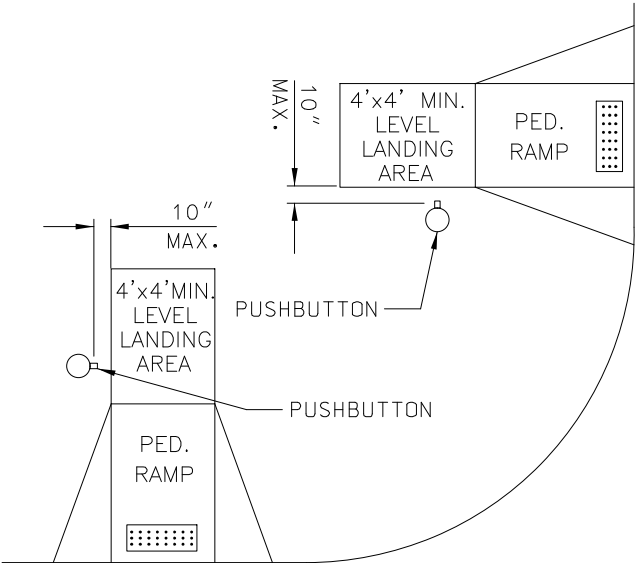
- 24) Jumper "like" heads/phases with 7c on mast arm only. A maximum of two 7-conductor jumpers are allowed between three signal heads. Use separate 7c for last head on mast arm regardless of phase.

PROJECT SPECIFIC NOTES

- 1) All poles, mast arms and luminaire arms shall be City standard poles, to meet the KCMO specifications at all signalized intersections. Traffic signal poles with mast arms oriented over the proposed streetcar system will require a modified installation height. Refer to sheet T201 for the various installation methods.
- 2) The Contractor shall connect fiber optic cable at all of the project intersections.
- 3) The Contractor shall coordinate with KCMO staff before installing, configuring and testing the communication equipment.
- 4) Refer to latest edition of TS500B and the project specific Technical Special Provisions for additional requirements.
- 5) Mast Arms to be Curvilinear (see detail sheet T205).
- 6) Refer to Lighting sheets for quantities and additional details. Street lighting shown in signal plans are for reference only.
- 7) Controller shall be 2070 with ASC/3 software.
- 8) CCTV cameras shall be PTZ with 360 add on camera, refer to project spifications for details.
- 9) Vehicle detection shall be Wavetronix Matrix Stop Bar detection system utilizing rail mount preassembled 19-inch rack backpanel, or approved equal. Prior to installation, perform walk-through of manufacturer/vendor confirm radar antenna placement. Refer to the project specifications for details.
- 10) Pedestrian pushbuttons shall be Polara Navigator 2-wire iNS pushbutton stations, or approved equal. Refer to the project specifications for details.
- 11) Fiber optic interface (FIP) in signal cabinet shall be Gator Patch, or approved equal. Refer to the project specifications for details.
- 12) Traffic signal cabinet shall have laptop drop down shelf on front and back doors.

Based on potential utility conflicts: Contractor to verify final pushbutton installation location is within 10 inches maximum reach of level landing area. This may require the installation of various length mounting extensions.

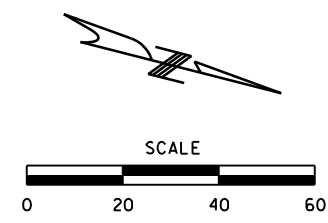
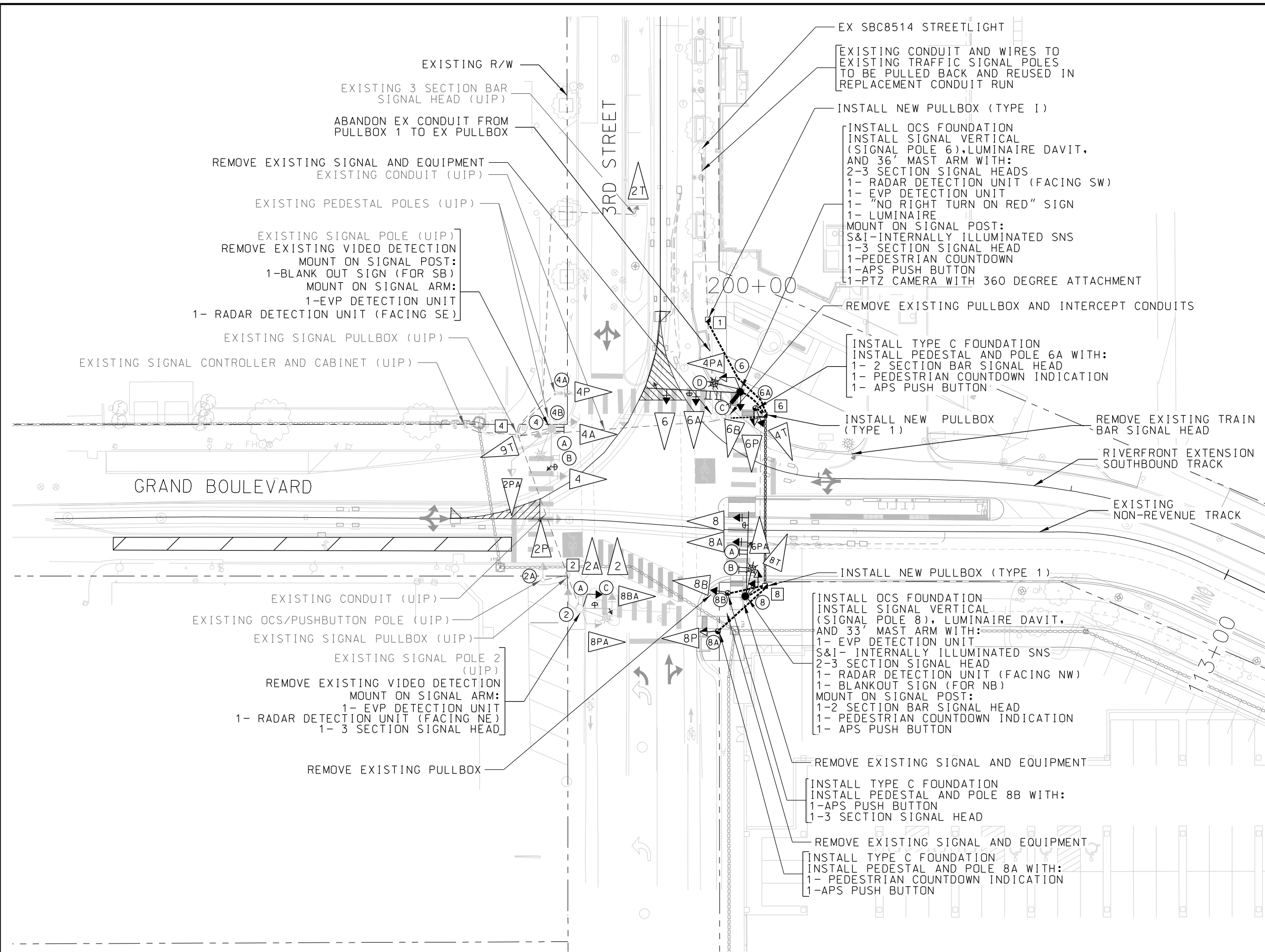
In instances where pole location deems an extension unfeasable: The installation of a 42" pedestrian stub pole will be required for compliant pushbutton installation.



PUSHBUTTON INSTALLATION DETAIL

REV	DATE	DESCRIPTION	DESIGNED BY SMA		<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	
			CHECKED BY JLH				10450 Holmes Road Suite 600 Kansas City, MO 64131-3471 816-360-2700 Certificate of Authority: 000856		FILENAME: T100.dgn	
			DRAWN BY MMO						CONTRACT NO.: CONTRACT NO. ***	
			CHECKED BY JLH						VOLUME:	
			APPROVED BY NKS						DRAWING NO.: T100	SHEET NO.: 214
PLOT DATE: 12/23/2022			10:07:00 AM	DATE	12-23-2022	NOT FOR CONSTRUCTION				

TRAFFIC SIGNAL GENERAL NOTES



- ### INTERSECTION NOTES
1. REMOVE AND SALVAGE EXISTING SIGNAL EQUIPMENT FROM THIS SIGNAL SYSTEM, EXCEPT WHERE SHOWN AS UIP.
 2. ABANDON EXISTING SIGNAL CONDUITS, EXCEPT WHERE SHOWN AS UIP.
 3. COORDINATE WITH TRAFFIC CONTROLLER MANUFACTURER FOR TSP/EVP IN-CABINET MODULES AND LICENSES.
 4. COORDINATE WITH MID AMERICA OR OTHER SUPPLIER FOR RADAR DETECTOR INSTALLATION.
 5. APPLY BLACK COLOR COATING ON TRAFFIC SIGNAL POLE, MAST ARM TO MEET KCMO SPECIFICATIONS.

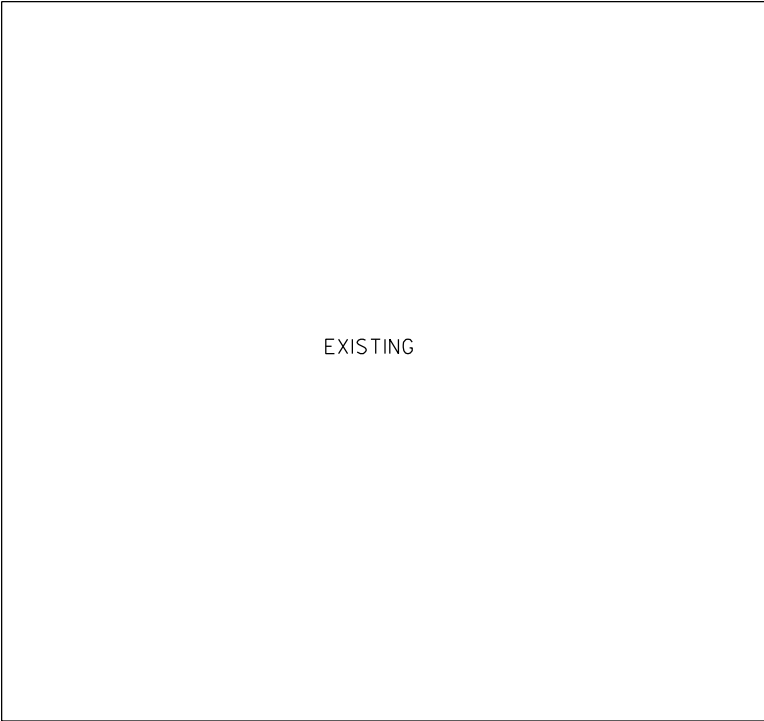
SIGNAL FACE KEY

2 (EX)	4T	2P (EX)	2T (EX)	8B	8BA
2A (EX)	8T	2PA (EX)	9T (EX)		
4 (EX)		4P (EX)			
4A (EX)		4PA			
6, 6A		6P, 6PA, 8P			
6B, 8, 8A		8PA (EX)			

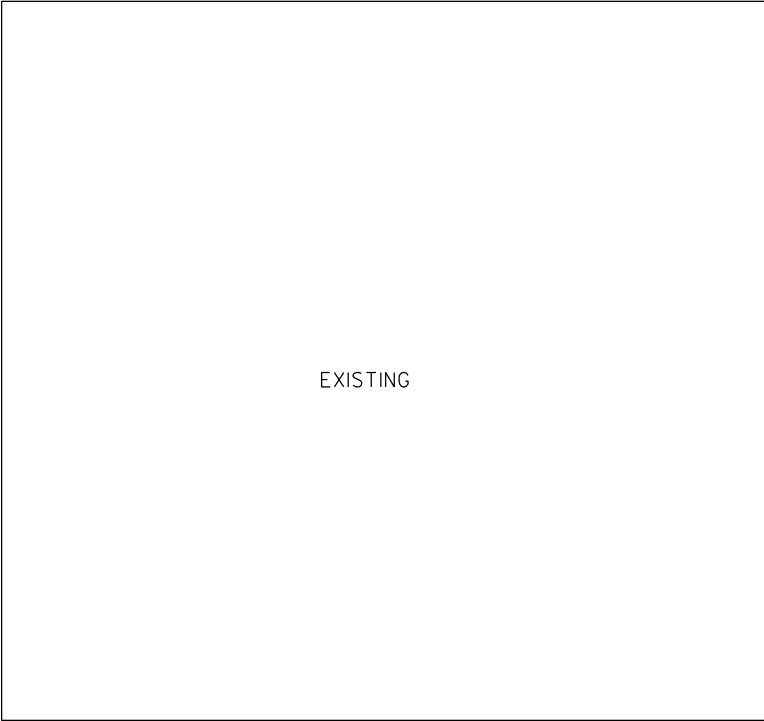
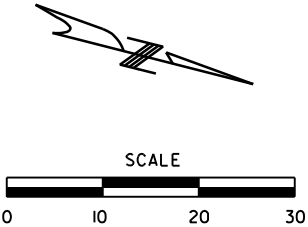
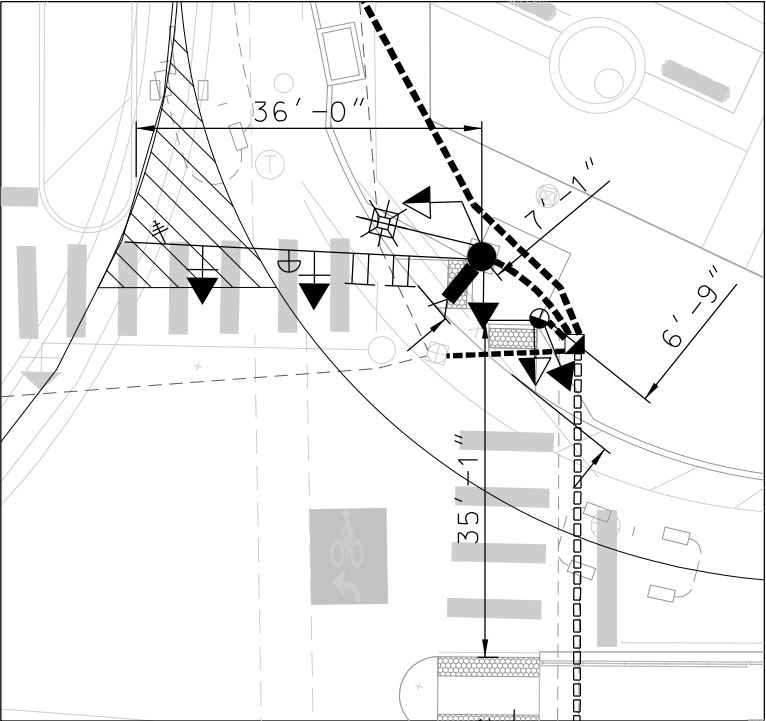
SIGN KEY

BLANKOUT SIGN (A)	(B)	(C)
NO RIGHT TURN ON RED R10-11B 24"x30" (D)		

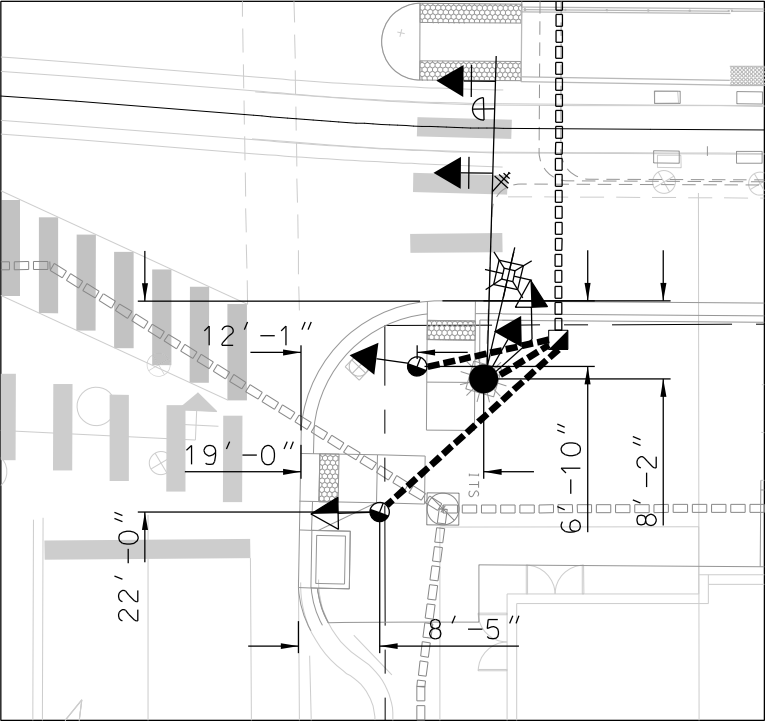
REV	DATE	DESCRIPTION	DESIGNED BY SMA		<div>This set of plans is not for construction. These plans are intended to build interest in bidding the project.</div>	ISSUED FOR BID	DATE: 12-23-2022	KANSAS CITY STREETCAR - RIVERFRONT EXTENSION TRAFFIC SIGNAL LAYOUT PLAN 3RD STREET AND GRAND BOULEVARD	SCALE FOR 22"x34": 1" = 20'		
			CHECKED BY JLH				10450 Holmes Road Suite 600 Kansas City, MO 64131-3471 816-360-2700 Certificate of Authority: 000856		NOT FOR CONSTRUCTION	FILENAME: T101.dgn	CONTRACT NO.:
			DRAWN BY MMO							CONTRACT NO. ***	VOLUME:
			CHECKED BY JLH								
			APPROVED BY NKS						DRAWING NO.:	SHEET NO.:	
PLOT DATE: 12/23/2022			10:07:05 AM	DATE: 12-23-2022				T101	215		



EXISTING





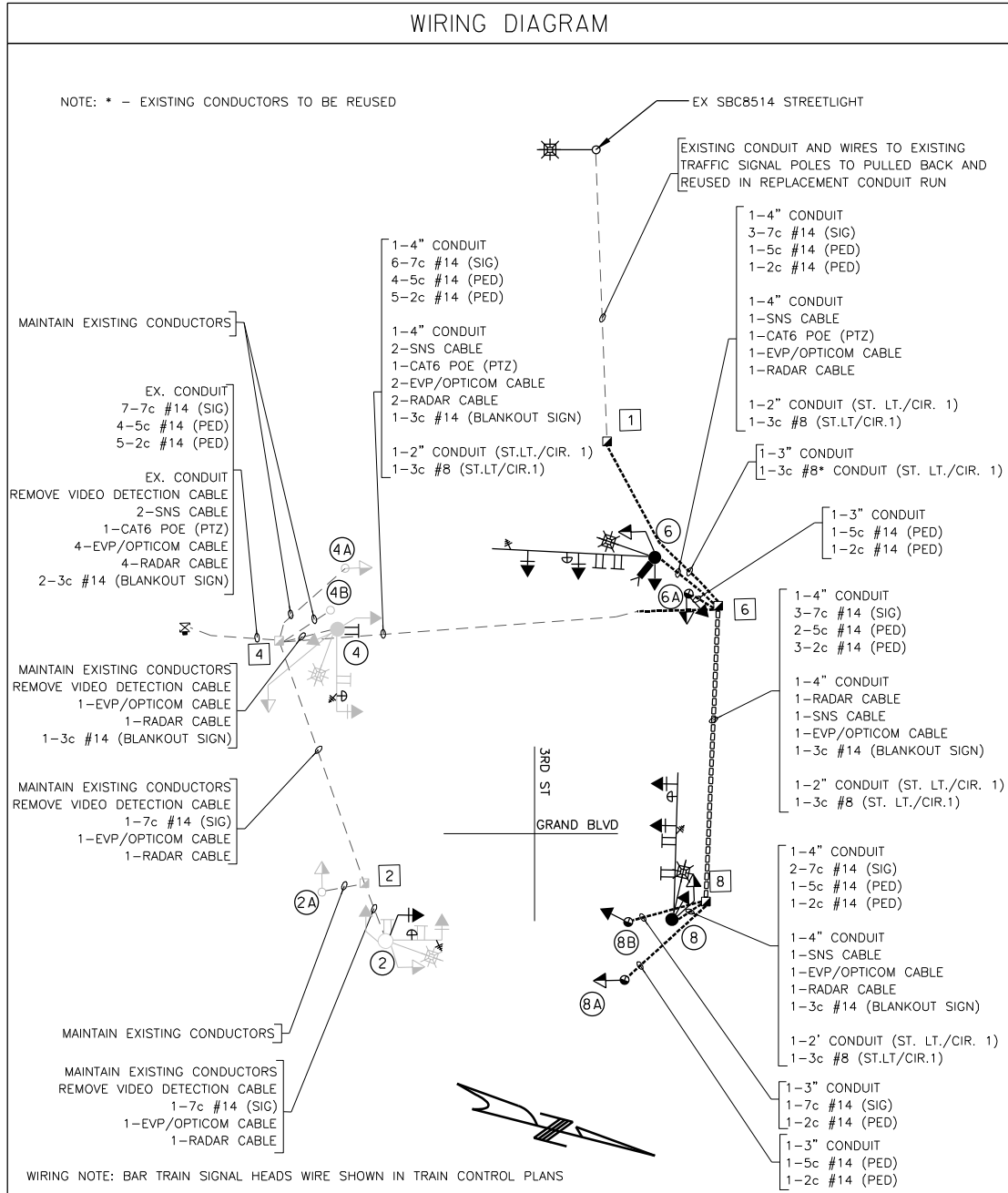
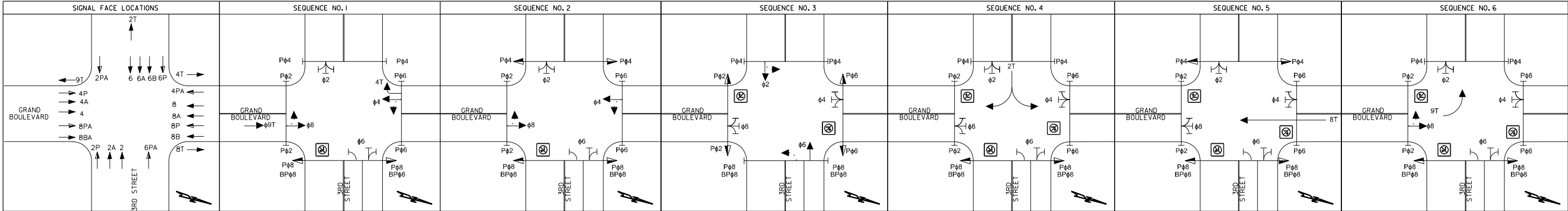
EXISTING



GENERAL NOTES

- 1. CONTRACTOR TO MODIFY THE SIGNALS AS SHOWN IN THE PLANS. MODIFICATIONS SHALL BE DONE IN ACCORDANCE WITH STANDARD SPECIFICATIONS.
- 2. CONTRACTOR TO INSTALL NEW RADAR DETECTION EQUIPMENT.
- 3. CONTRACTOR TO INSTALL NEW APS PEDESTRIAN SIGNAL EQUIPMENT IN ACCORDANCE WITH PROWAG GUIDELINES.
- 4. ALL REMOVED SIGNAL AND LIGHTING APPURTENANCES TO BE RETURNED TO KCMO PUBLIC WORKS, TRAFFIC SIGNAL SECTION.

REV	DATE	DESCRIPTION	DESIGNED BY	SMA		<div><div>This set of plans is not for construction. These plans are intended to build interest in bidding the project.</div><div>22</div></div>	ISSUED FOR BID	DATE: 12-23-2022	KANSAS CITY STREETCAR - RIVERFRONT EXTENSION	SCALE FOR 22"x34":			
			CHECKED BY	JLH				HDR Engineering, Inc.		10450 Holmes Road Suite 600 Kansas City, MO 64131-3471 816-360-2700 Certificate of Authority: 000856	NOT FOR CONSTRUCTION	1" = 10'	
			DRAWN BY	MMO								FILENAME:	
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			APPROVED BY	NKS								CONTRACT NO.:	
PLOT DATE: 12/23/2022			DATE		12-23-2022	10:07:08 AM			CONTRACT NO. ***				
									VOLUME:				
									DRAWING NO.:				
									SHEET NO.:				
									T101A				
									216				



CONTROLLER AND EQUIPMENT		TOTALS
CABINET: 332L with Auxiliary Cabinet	EX.	
CONTROLLER: Type 2070C Complete per specs, including software.	EX.	
UPGRADE CONTROLLER CPU MODULE to 2070-IC	EX.	
STREET LIGHT CONTROLLER		
CONFLICT MONITOR with Ethernet Port	EX.	
EOS or Approved EqualSoftware License	EX.	
Opticom Model764 Phase Selector	I	
Opticom Model768 Interface Panel	EX.	
Opticom Model721Receiver	4	
InstallSM24BT2DPB Network Switch	I	
Fiber Optic Patch Panel	EX.	
4-Port Radar Interface Unit	I	
REMARKS:		
1. Furnish and install.		

POWER SUPPLY				
LOCATION	Power Supply Asmb.	CIRCUIT BREAKER TRIP RATINGS(AII Two-Pole)		
		INSIDE CABINET	OUTSIDE CABINET	
N.E. CORNER	I		Signals	Street Light
TOTAL	I	30 AMP	50 AMP	30 AMP

FLASHING OPERATIONS	
EMERGENCY	SCHEDULED
FY - 0's	FY - 0's
FR - 0's 2,4,6,8	FR - 0's 2,4,6,8

INPUT FILE ASSIGNMENTS TYPE 332L CABINET													
I	2	3	4	5	6	7	8	9	10	11	12	13	14
U											PED 02	PED 06	FLH
L											PED 04	PED 08	STOP
U													TIME
L													

OUTPUT FILE ASSIGNMENTS													
FR1	01	02	03	04	05	06	07	08	09	10	11	12	13
FR2													
FR3	05	06	07	08	09	10	11	12	13	14	15	16	17
FR4													
K1	09	10	11	12	13	14	15	16	17	18	19	20	21
K2	01-R, Y,F,Y	03-R, Y,F,Y	05-R, Y,F,Y	07-R, Y,F,Y	09-R, Y,F,Y	11-R, Y,F,Y	13-R, Y,F,Y	15-R, Y,F,Y	17-R, Y,F,Y	19-R, Y,F,Y	21-R, Y,F,Y	23-R, Y,F,Y	25-R, Y,F,Y

SEQUENCE / INTERVAL																																		
APPROACH	FACE NO.	SEQUENCE NO. 1				SEQUENCE NO. 2				SEQUENCE NO. 3				SEQUENCE NO. 4				SEQUENCE NO. 5				SEQUENCE NO. 6												
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4									
EASTBOUND 3RD ST		2	R	R	R	R	R	R	R	R	G	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R								
	2A	R	R	R	R	R	R	R	R	R	G	G	Y	R	R	R	R	R	R	R	R	R	R	R	R									
	2P	DW	DW	DW	DW	DW	DW	DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW									
	2PA	DW	DW	DW	DW	DW	DW	DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW									
WESTBOUND 3RD ST		6	R	R	R	R	R	R	R	R	G	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R								
	6A	R	R	R	R	R	R	R	R	R	G	G	Y	R	R	R	R	R	R	R	R	R	R	R	R									
	6B	R	R	R	R	R	R	R	R	R	G	G	Y	R	R	R	R	R	R	R	R	R	R	R	R									
	6P	DW	DW	DW	DW	DW	DW	DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW									
6PA	DW	DW	DW	DW	DW	DW	DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW										
NORTHBOUND GRAND BLVD		8	G	G	Y	R	G	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	G	G	Y	R							
	8A	G	G	Y	R	G	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	G	G	Y	R								
	8P	W	FDW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	W	FDW	DW	DW	W	FDW	DW	DW	W	FDW	DW	DW	DW								
	8PA	W	FDW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	W	FDW	DW	DW	W	FDW	DW	DW	W	FDW	DW	DW	DW								
SOUTHBOUND GRAND BLVD		8B	G	G	Y	R	G	G	Y	R	R	R	R	R	G	G	Y	R	G	Y	R	G	G	Y	R	G								
	8BA	G	G	Y	R	G	G	Y	R	R	R	R	R	R	G	G	Y	R	G	Y	R	G	G	Y	R	G								
	4	G	G	Y	R	G	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R								
	4A	G	G	Y	R	G	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R								
NORTHBOUND STREETCAR		9T	W	FDW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW								
	4PA	W	FDW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW								
SOUTHBOUND STREETCAR		9T	WV	WV	WV	WV	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH								
	4T	WV	WV	WV	WV	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH								
EASTBOUND STREETCAR		2T	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH								
	8T	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH								
SOUTHBOUND STREETCAR (IN NB TRACK)			8T	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH	YH								
HEAD LEGEND			G= GREEN BALL Y= YELLOW BALL R= RED BALL								GA= GREEN ARROW YA= YELLOW ARROW FYA=FLASHING YELLOW ARROW								RA= RED ARROW W= WALK FDW=FLASHING DON'T WALK								DW= DON'T WALK YH= YELLOW HORIZONTAL (STOP) WV= WHITE VERTICAL(GO) WA= WHITE ANGLE (GO CHOICE DIRECTION)							

INTERVAL		PHASE							
		1	2	3	4	5	6	7	8
WALK			EX.		EX.		EX.		EX.
DON'T WALK			EX.		EX.		EX.		EX.
MIN INITIAL			EX.		EX.		EX.		EX.
MAX INITIAL									
ADD/VEH									
VEH EXT			EX.		EX.		EX.		EX.
TIME BFR REDUC									
TIME TO REDUC									
MIN GAP			EX.		EX.		EX.		EX.
MAX LIMIT			EX.		EX.		EX.		EX.
MAXIMUM 2									
YELLOW			EX.		EX.		EX.		EX.
RED CLEAR			EX.		EX.		EX.		EX.

REV	DATE	DESCRIPTION	DESIGNED BY	SMA
			CHECKED BY	JLH
			DRAWN BY	MMO
			CHECKED BY	JLH
			APPROVED BY	NKS
PLOT DATE: 12/23/2022			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	
HDR		HDR Engineering, Inc.	
10450 Holmes Road		Suite 800	
Kansas City, MO 64131-3471		816-360-2700	
Certificate of Authority: 000856		NOT FOR CONSTRUCTION	

KANSAS CITY STREETCAR - RIVERFRONT EXTENSION

TRAFFIC SIGNAL WIRING DIAGRAM AND PHASING 3RD STREET AND GRAND BOULEVARD

SCALE FOR 22"x34": 1" = 20'	
FILENAME: T101B.dgn	
CONTRACT NO.: CONTRACT NO. ***	
VOLUME:	
DRAWING NO.: T101B	SHEET NO.: 217

POSTS																	
POST NO.	POLE LENGTH					MAST ARM LENGTH				SIGNAL HEAD SPACING*				LUMINAIRE TYPE (SEE LIGHTING PLANS)			REMARKS
										OUT BOARD	1ST IN BOARD	2ND IN BOARD	3RD IN BOARD	ARM LENGTH	KCMO LED TYPE D	POLE ID	
	OCS	18' / 28'	LT	PED	PB	33'	36'			A	B	C	D				
6	1						1			27	17			6	#1	SBC8506	Comb. OCS/Sig/Light
6A				1*													Pedestal Pole
8	1						1			31	21			6	#1	SBC8505	Comb. OCS/Sig/Light
8A					1												Pedestal Pole
8B					1												Bike PushButton Pedestal Pole
TOTALS	2				3		1	1		2	2			2	2	2	

*15'

BASES AND PULL BOXES													
LOCATIONS	NO		BASES							PULL BOXES			REMARKS
	POST	PULL BOX	B8	B10	B12	LT. POLE	C	PED PB POLE	OCS	E332	TYPE I	TYPE II	
NE Corner	8								1				
NE Corner	8A						1						
NE Corner	8B						1						
NW Corner	6								1				
NW Corner	6A						1						
NE Corner	8										1		
NW Corner	6										1		
NW Corner	1										1		
TOTALS	5	3					3		2		3		

CONDUITS										
FROM	TO	C-C DISTANCE	TRENCH				IN EXISTING TRENCH			
			1"	2"	3"	4"	1"	2"	3"	4"
EX PB4	PB6	15				14		14		14
PB6	Pole 6	13				14		14		14
PB6	Pole 6A	5			6					
PB6	PB8	65				63		63		63
PB8	Pole 8	9				10		10		10
PB8	Pole 8A	26			27					
PB8	Pole 8B	16			17					
PB1	PB6	47			45					
Sub-Totals						95	101		101	
TOTALS						95	105		105	

[illegible]

DETECTORS					
DET. NO.	PHASE	PUSH BUTTON	APS EQUIPMENT	RADAR DETECTION	PTZ+360 CAMERA
2	2			1	
4	4			1	
6	6			1	1
8	8			1	
4PA		1	1		
6P		1	1		
6PA		1	1		
8P		2	2		
TOTALS	5	5		4	1

CABLE QUANTITIES															
FROM	TO	C-C DISTANCE	POWER		LUMINAIRE	CONTROL TYPE 20-1				RADAR	EVP	INTERNALLY ILLUMINATED STREET NAME SIGN	CCTV	ITS	REMARKS
			1c#3	3c#8	1c#12 (Pole & Bracket)	2c#14	3c#14	5c#14	7c#14	Radar Cable	Opticom Cable	3c#10	CAT6	Drop Cable	
		17				140	56	112	196	112	112	56	28		
		59							65	65	65				
		14							20	20	20				
									10						
										32					
											26				
		14					20			20	20				
										35					
											35				
							13								
		98		104		520	104	416	624	208	208	208	104		1 RUN 3c#8
		13		19		19		19	57	19	19	19	19		1 RUN 3c#8
									48						
									38						
										53					
											40				
				108											3 RUNS 1c#12
									13						
								10							
	PB-4PA					9									
													30		
												18			
		5				11		11							
								10							
	PB-6P					9									
		65		71		213	71	142	213	71	71	71			1 RUN 3c#8
		9		15		15	15	15	30	15	15	15			1 RUN 3c#8
									56						
										39					
											48				
												35			
							42								
				108											3 RUNS 1c#12
									46						
								10							
	PB-6PA					9									
		26				32		32							
								10							
	PB-8A					9									
		16				22			22						
									10						
	PB-8B					9									
SUB-TOTALS				209	216	1,017	321	787	1,447	689	679	422	181		
TOTALS				220	230	1,070	340	830	1,520	730	720	450	200		

LEGEND

T - TOP MOUNT

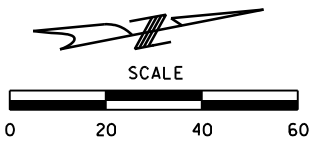
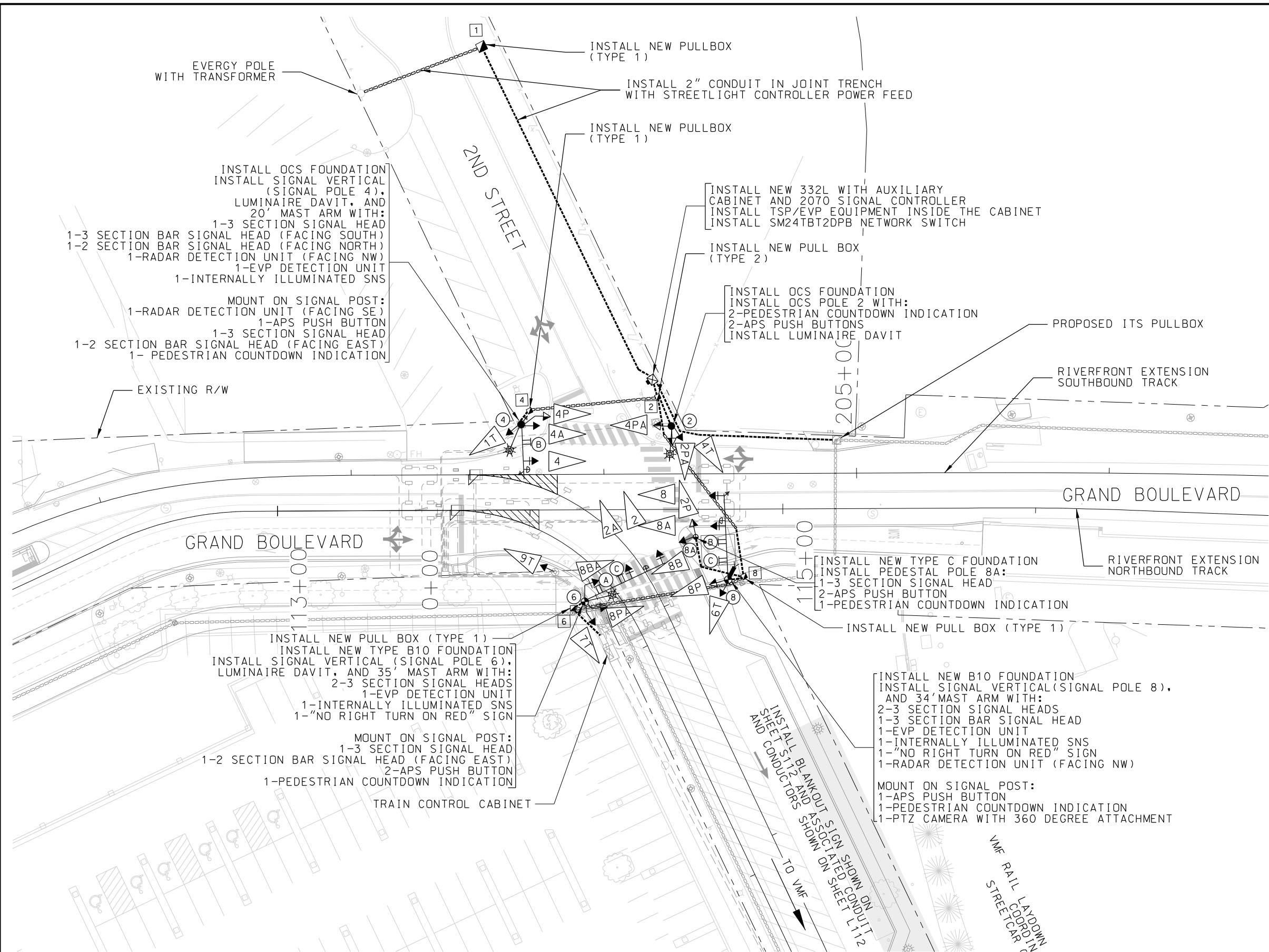
S - SIDE MOUNT

M - MAST ARM MOUNT

*NOTE: Signal head spacing to be adjusted to site conditions and approved by the project inspector.

35' LED MH

REV	DATE	DESCRIPTION	DESIGNED BY	SMA		<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>TRAFFIC SIGNAL SUMMARY OF QUANTITIES 3RD STREET AND GRAND BOULEVARD</div>	SCALE FOR 22"x34": NOT TO SCALE FILENAME: T101C.dgn CONTRACT NO.: CONTRACT NO. *** VOLUME: 1 DRAWING NO.: T101C SHEET NO.: 218
			CHECKED BY	JLH			 HDR Engineering, Inc. 10450 Holmes Road Suite 600 Kansas City, MO 64131-3471 816-380-2700 Certificate of Authority: 000856	NOT FOR CONSTRUCTION		
			DRAWN BY	MMQ						
			CHECKED BY	JLH						
			APPROVED BY	NKS						
PLOT DATE: 12/23/2022		10:07:13 AM	DATE	12-23-2022						



INTERSECTION NOTES

- 1. COORDINATE WITH EVERGY FOR POWER CONNECTION TO THE TRAFFIC CONTROLLER CABINET.
- 2. COORDINATE WITH TRAFFIC CONTROLLER MANUFACTURER FOR TSP/EVP IN-CABINET MODULES AND LICENSES.
- 3. COORDINATE WITH MID AMERICA OR OTHER SUPPLIER FOR RADAR DETECTOR INSTALLATION.
- 4. APPLY BLACK COLOR COATING ON TRAFFIC SIGNAL POLE, MAST ARM TO MEET KCMO SPECIFICATIONS.

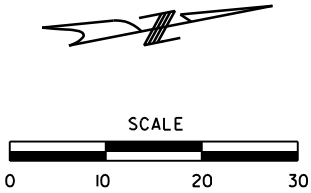
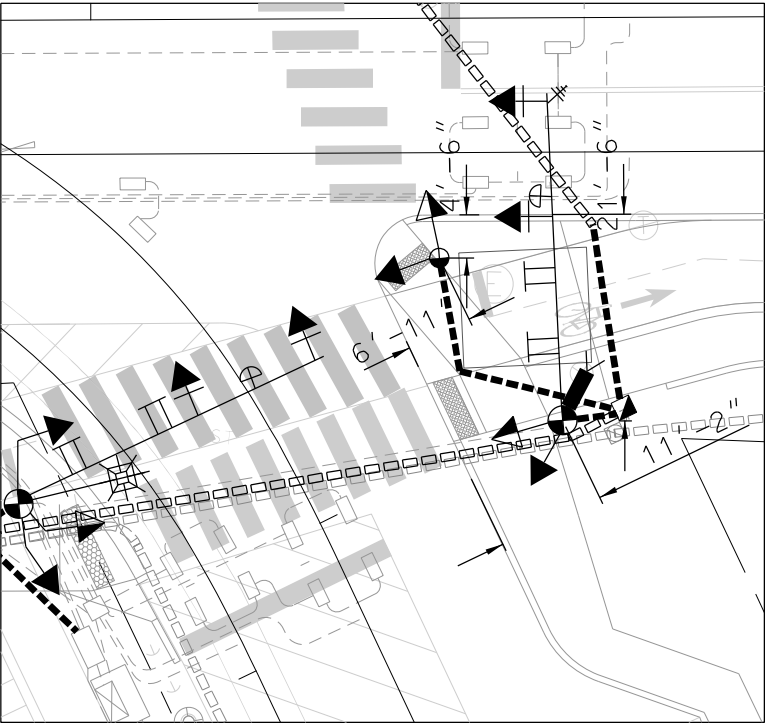
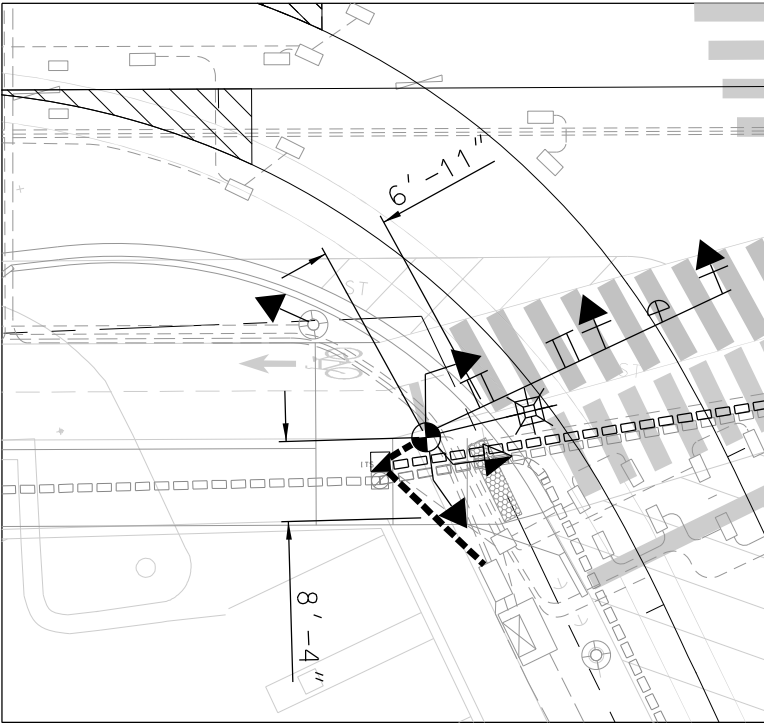
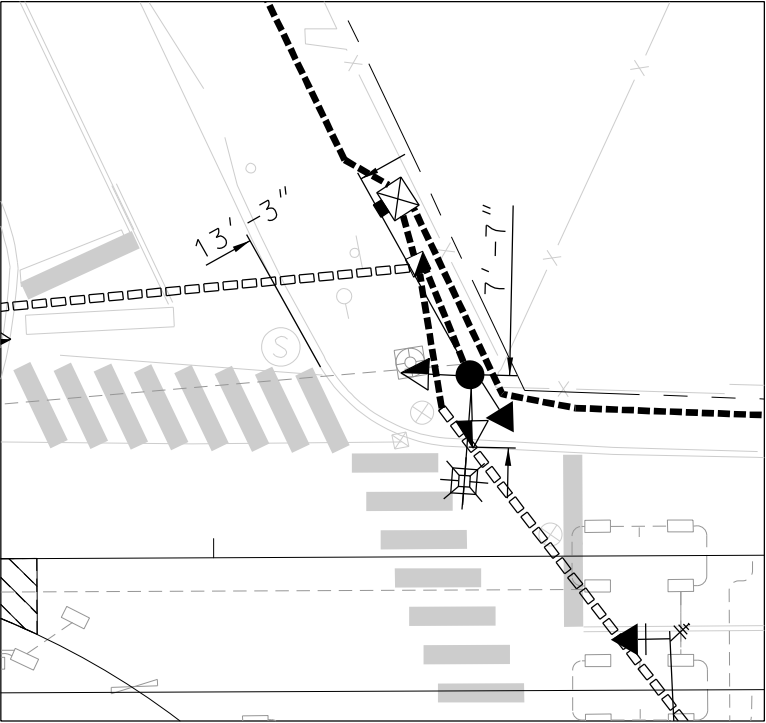
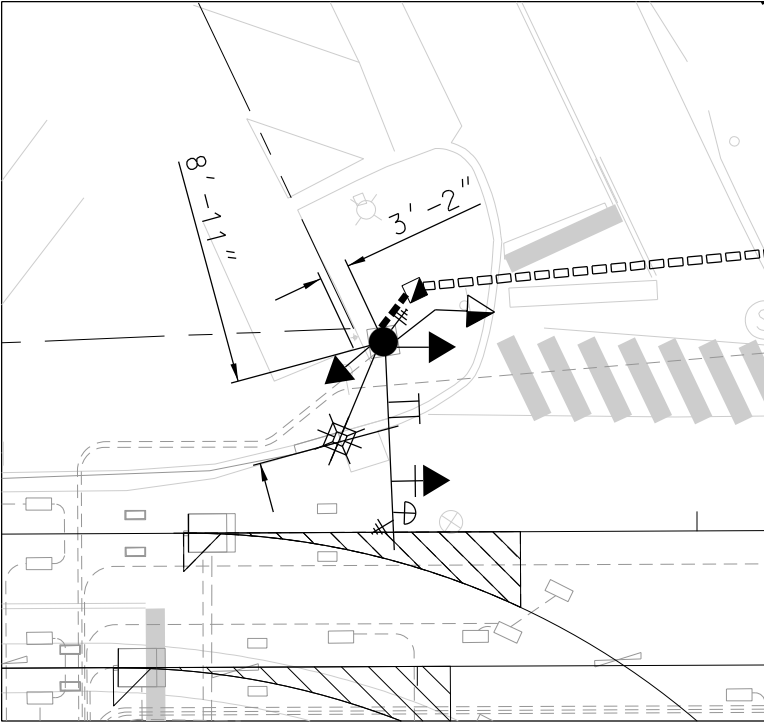
SIGNAL FACE KEY

2, 2A	2P, 2PA	4T, 6T	1T, 9T	8B	8BA
4, 4A	4P, 4PA				
8, 8A	8P, 8PA				

SIGN KEY


R10-11B
24"x30"
C

<table><tr><th>REV</th><th>DATE</th><th>DESCRIPTION</th></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></table>			REV	DATE	DESCRIPTION																DESIGNED BY SMA	 <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": 1" = 20'	
REV	DATE	DESCRIPTION																											
			CHECKED BY JLH	 <div>HDR Engineering, Inc. 10450 Holmes Road Suite 600 Kansas City, MO 64131-3471 816-360-2700 Certificate of Authority: 000856</div>	TRAFFIC SIGNAL LAYOUT PLAN		FILENAME: T102.dgn																						
			DRAWN BY MMO		2ND STREET AND GRAND BOULEVARD		CONTRACT NO.: ***																						
			CHECKED BY JLH				VOLUME:																						
			APPROVED BY NKS	NOT FOR CONSTRUCTION		DRAWING NO.:																							
PLOT DATE: 12/23/2022			DATE 12-23-2022					SHEET NO.:																					
								T102		219																			



GENERAL NOTES

- 1. CONTRACTOR TO MODIFY THE SIGNALS AS SHOWN IN THE PLANS. MODIFICATIONS SHALL BE DONE IN ACCORDANCE WITH STANDARD SPECIFICATIONS.
- 2. CONTRACTOR TO INSTALL NEW RADAR DETECTION EQUIPMENT.
- 3. CONTRACTOR TO INSTALL NEW APS PEDESTRIAN SIGNAL EQUIPMENT IN ACCORDANCE WITH PROWAG GUIDELINES.
- 4. ALL REMOVED SIGNAL AND LIGHTING APPURTENANCES TO BE RETURNED TO KCMO PUBLIC WORKS, TRAFFIC SIGNAL SECTION.
- 5. INSTALL FIBER OPTIC CABLE TO NEW SIGNAL CABINET.

REV	DATE	DESCRIPTION	DESIGNED BY	SMA	<div><div>This set of plans is not for construction. These plans are intended to build interest in bidding the project.</div></div>	ISSUED FOR BID	DATE: 12-23-2022	KANSAS CITY STREETCAR - RIVERFRONT EXTENSION		TRAFFIC SIGNAL LAYOUT PLAN 2ND STREET AND GRAND BOULEVARD		SCALE FOR 22"x34": 1" = 10'	
			CHECKED BY	JLH		<div><div>HDR Engineering, Inc. 10450 Holmes Road Suite 600 Kansas City, MO 64131-3471 816-360-2700 Certificate of Authority: 000856</div></div>						FILENAME:	
			DRAWN BY	MMO								CONTRACT NO.:	
			CHECKED BY	JLH								CONTRACT NO. ***	
			APPROVED BY	NKS								VOLUME:	
PLOT DATE: 12/23/2022			10:07:21 AM		DATE	12-23-2022	NOT FOR CONSTRUCTION		DRAWING NO.:	T102A	SHEET NO.:	220	

DETECTORS					
DET. NO.	PHASE	PUSH BUTTON	APS EQUIPMENT	RADAR DETECTION	PTZ+360 CAMERA
2	2			1	
4	4			1	
8	8			1	1
2P		1	1		
2PA		1	1		
4P		1	1		
4PA		1	1		
8P		2	2		
8PA		2	2		
TOTALS	8	8	8	3	1

BASES AND PULL BOXES														
LOCATIONS	NO		BASES								PULL BOXES			REMARKS
	POST	PULL BOX	B8	B10	B12	LT. POLE	C	PED PB POLE	OCS	E332	TYPE I	TYPE II	TYPE III	
NW Corner	2								1					
SW Corner	4								1					
SE Corner	6			1										
NE Corner	8			1										
NE Corner	8A						1							
NW Corner		2										1		
SW Corner		4									1			
SE Corner		6									1			
NE Corner		8									1			
NW Corner		1									1			
TOTALS	5	5		2			1		2		4	1		

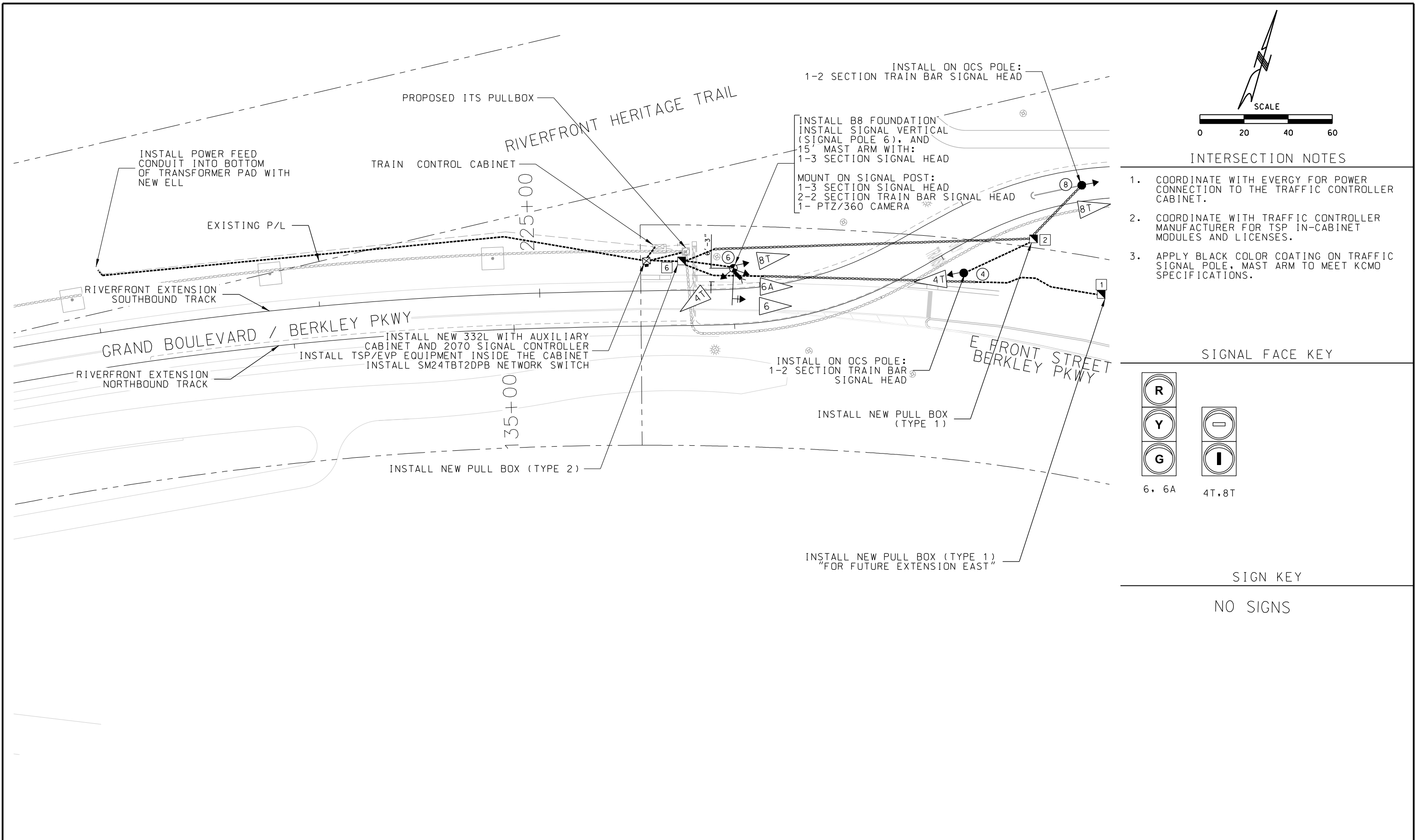
SIGNAL HEADS																																											
NO.		INDICATIONS															VISORS		BRACKET						ONE - FACE																		
POST	FACE	12" LED'S															The Hand and The Walking Person	Type		Type		Sections				Sections																	
		R	Y	G	R←	Y←	FY←	G←	R↯	Y↯	G↯	R→	Y→	G→	—			/	Tunnel	Cut Away	Std.			Spec.			1	3	4	5	1		2		3			4			5		
																					I	II	III									T	S	S	M	T	S	M	T	S	M	T	S
2	2P																	1			1																						
2	4PA																	1																									
4	4	1	1	1														3		1																							
4	4T															1	1		2		1																						
4	4A	1	1	1														3		1																							
4	6T															1	1		2		1																						
4	4P																	1																									
4	1T															1	1	1	3		1																						
6	7T															1	1		3		1																						
6	8PA																	1																									
6/8A	8BA/8B									2	2	2						6		2																							
8	9T															1	1	1	3		1																						
8	8	1	1	1														3		1																							
8	8A	1	1	1														3		1																							
8	2PA																	1																									
8A	2	1	1	1														3		1																							
8A	2A	1	1	1														3		1																							
8A	8P																	1																									
TOTALS		6	6	6						2	2	2				5	5	2	6	37		16																					

LEGEND
T - TOP MOUNT
S - SIDE MOUNT
M - MAST ARM MOUNT

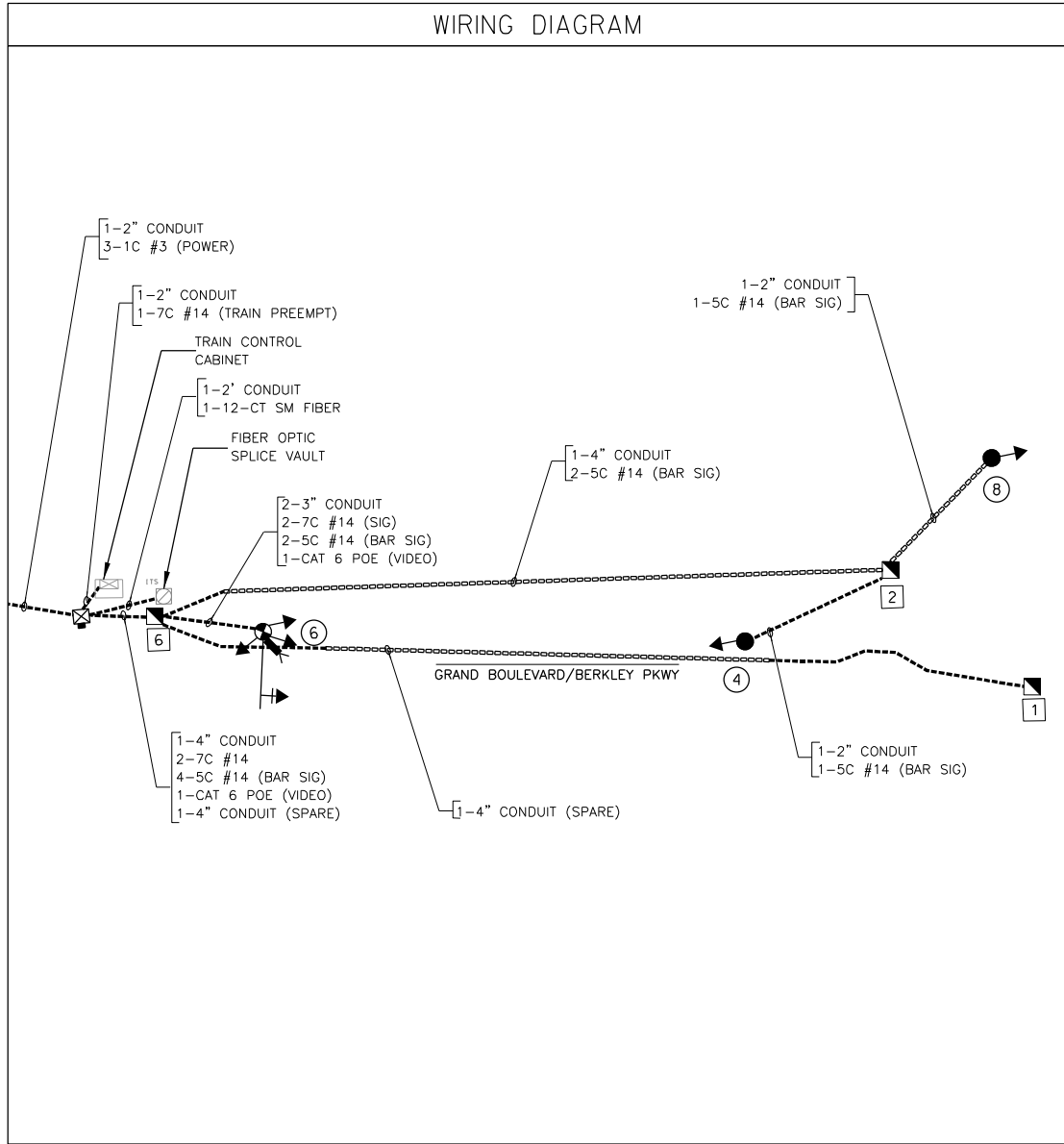
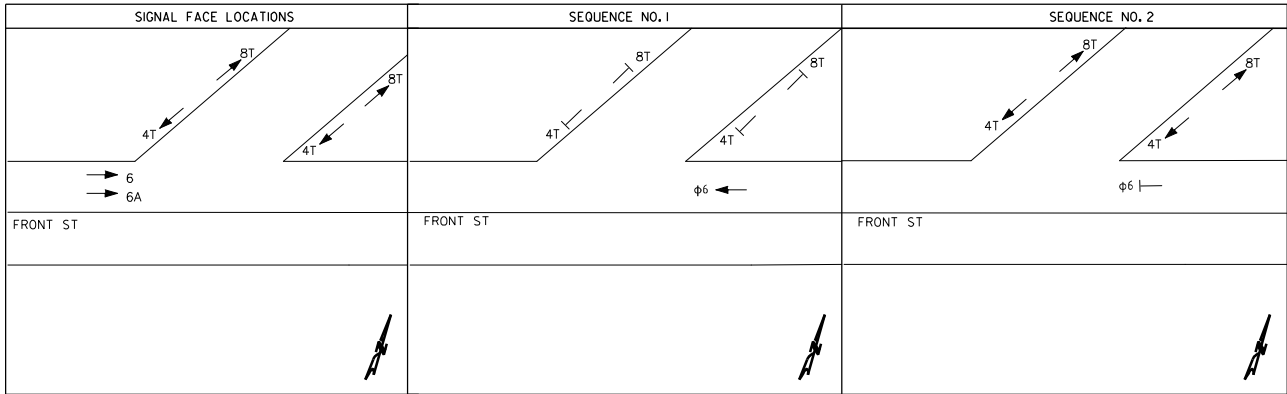
Note: Signal head spacing to be adjusted to site conditions and approved by the project sponsor.
*35 LED MH

CONDUITS										
FROM	TO	C-C DISTANCE	TRENCH				IN EXISTING TRENCH			
			1 "	2 "	3 "	4 "	1 "	2 "	3 "	4 "
P.S	PB1	52		55						
PB1	Controller	148		151						
Controller	PB2	8				11	11	11	11	11
PB2	Pole 2	13			14					
PB2	PB4	52				50		50		50
Controller	ITS PB	86		84						
PB4	Pole 4	7			8			8	8	
PB2	PB8	81				79		79		79
PB8	Pole 8	7			8				8	
PB8	Pole 8A	30			31					
PB8	PB6	70				68		68		68
PB6	Pole 6	6			7			7	7	
PB6	TRAIN PB	18		16						
STL SBC5518	PB4	10			13					
SUB TOTALS				306	81	208	11	223	34	208
TOTALS				310	85	220	15	235	40	220

CABLE QUANTITIES															
FROM	TO	C-C DISTANCE	POWER		LUMINAIRE	CONTROL TYPE 20-1				RADAR	EVP	ILLUMINATED STREET NAME SIGN	CCTV	ITS	REMARKS
			1c#3	3c#8	1c#12 (Pole & Bracket)	2c#14	3c#14	5c#14	7c#14	Radar Cable	Opticom Cable	3c#10	CAT6	Drop Cable	
		52	288												3 RUNS 1c#3
STL SBC5518		148	477												3 RUNS 1c#3
		10		63											1 RUNS 3c#8
		8			114		114	133	57	57	57	19			
		13		19		38		38							1 RUNS 3c#8
								10							
	PB-2PA					9									
								10							
	PB-4PA					9									
					90										3 RUNS 1c#12
		52		58		58		58	116	116	58	58			1 RUNS 3c#8
		7		13		13		13	26	26	13	13			1 RUNS 3c#8
									33						
										38					
											38				
									13						
								10							
	PB-4P					9									
										20					
					90										3 RUNS 1c#12
												27			
		81				435		261	522	87	174	174	87		1 RUN 3c#8
		7				13		13	26	13	13	13	13		
									52						
										53					
											44				
									32						
								10							
	PB-8P					9									
													30		
												47			
		30				72		36	36						
								10	10						
	PB-2P/ PB-8B					18									
		70		76		76		76	228		76	76			1 RUN 3c#8
		6		12		12		12	36		12	12			1 RUN 3c#8
									52						
									36						
											47				
												26			
								10							
	PB-8PA/ PB-8BA					18									
					90										3 RUNS 1c#12
	TRAIN PB	10							16						
TRAIN PB	TRAIN CTL	7							13						
		86												185	
SUB-TOTALS			765	367	241	991	0	681	1,380	410	532	503	149	185	
TOTALS			805	390	255	1045	0	720	1,450	435	560	530	160	185	



REV		DATE	DESCRIPTION	DESIGNED BY	SMA		<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 TRAFFIC SIGNAL LAYOUT PLAN BERKLEY PARKWAY / RIVERFRONT DRIVE		SCALE FOR 22"x34": 1" = 20'	
				CHECKED BY	JLH					HDR Engineering, Inc.				FILENAME: T103.dgn	
				DRAWN BY	MMO			10450 Holmes Road Suite 600 Kansas City, MO 64131-3471 816-360-2700 Certificate of Authority: 000856		CONTRACT NO.: CONTRACT NO. ***					
				CHECKED BY	JLH					VOLUME: 1					
				APPROVED BY	NKS					DRAWING NO.: T103				SHEET NO.: 223	
PLOT DATE:		12/23/2022		10:07:32 AM		DATE	12-23-2022		NOT FOR CONSTRUCTION						



CONTROLLER AND EQUIPMENT	TOTALS
CABINET: 332L with Auxiliary Cabinet	1
CONTROLLER: Type 2070C Complete per specs, including software.	1
UPGRADE CONTROLLER CPU MODULE to 2070-1C	1
STREET LIGHT CONTROLLER	
CONFLICT MONITOR with Ethernet Port	1
EOS or Approved Equal Software License	1
Opticom Model 762 (or 764) Phase Selector	
Opticom Model 768 Interface Panel	
Opticom Model 721 Receiver	
Install SM24TB120PB Network Switch	1
Fiber Optic Patch Panel	1
4-Port Radar Interface Unit	
REMARKS:	
1. Furnish and install.	

POWER SUPPLY				
LOCATION	Power Supply Asmb.	CIRCUIT BREAKER TRIP RATINGS (All Two-Pole)		
N.E. CORNER	1	INSIDE CABINET	OUTSIDE CABINET	
			Signals	Street Lights
TOTAL	1	30 AMP	50 AMP	30 AMP

FLASHING OPERATIONS	
EMERGENCY	SCHEDULED
FY - 0's	FY - 0's
FR - 0's 6	FR - 0's 6

SEQUENCE/INTERVAL																									
APPROACH	FACE NO.	SEQUENCE NO. 1				SEQUENCE NO. 2				SEQUENCE NO. 3				SEQUENCE NO. 4				SEQUENCE NO. 5				SEQUENCE NO. 6			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
WESTBOUND FRONT ST	6	G	G	Y	R	R	R	R	R																
	6A	G	G	Y	R	R	R	R	R																
NORTHBOUND STREETCAR	4T	YH	YH	YH	YH	WV	WV	WV	YH																
SOUTHBOUND STREETCAR	8T	YH	YH	YH	YH	WV	WV	WV	YH																
	R																								
HEAD LEGEND		G = GREEN BALL Y = YELLOW BALL R = RED BALL				GA = GREEN ARROW YA = YELLOW ARROW FYA = FLASHING YELLOW ARROW				RA = RED ARROW W = WALK FDW = FLASHING DON'T WALK				DW = DON'T WALK YH = YELLOW HORIZONTAL (STOP) WV = WHITE VERTICAL (GO)											

		SIGNAL TIMINGS								
		PHASE								
INTERVAL		SC	1	2	3	4	5	6	7	8
	WALK									
	DON'T WALK									
	MIN INITIAL							10		
	MAX INITIAL									
	ADD/VEH									
	VEH EXT							4		
	TIME BFR REDUC									
	TIME TO REDUC									
	MIN GAP									
	MAX LIMIT									
	MAXIMUM 2									
YELLOW							4.8			
RED CLEAR							1.5			

NOTE: SET PHASE 6 TO DWELL GREEN

INPUT FILE ASSIGNMENTS TYPE 332L CABINET													
I	2	3	4	5	6	7	8	9	10	11	12	13	14
U											PED 02	PED 06	FLH
L											PED 02	PED 06	STOP
U											PED 04	PED 08	TIME
L													

OUTPUT FILE ASSIGNMENTS													
FR1	01	02	02	03	04	04							
FR2			PED			PED							
FR3	05	06	06	07	08	08							
FR4			PED			PED							
K1	09	010		011	012								
K2	01-R, Y, FY	03-R, Y, FY		05-R, Y, FY	07-R, Y, FY								

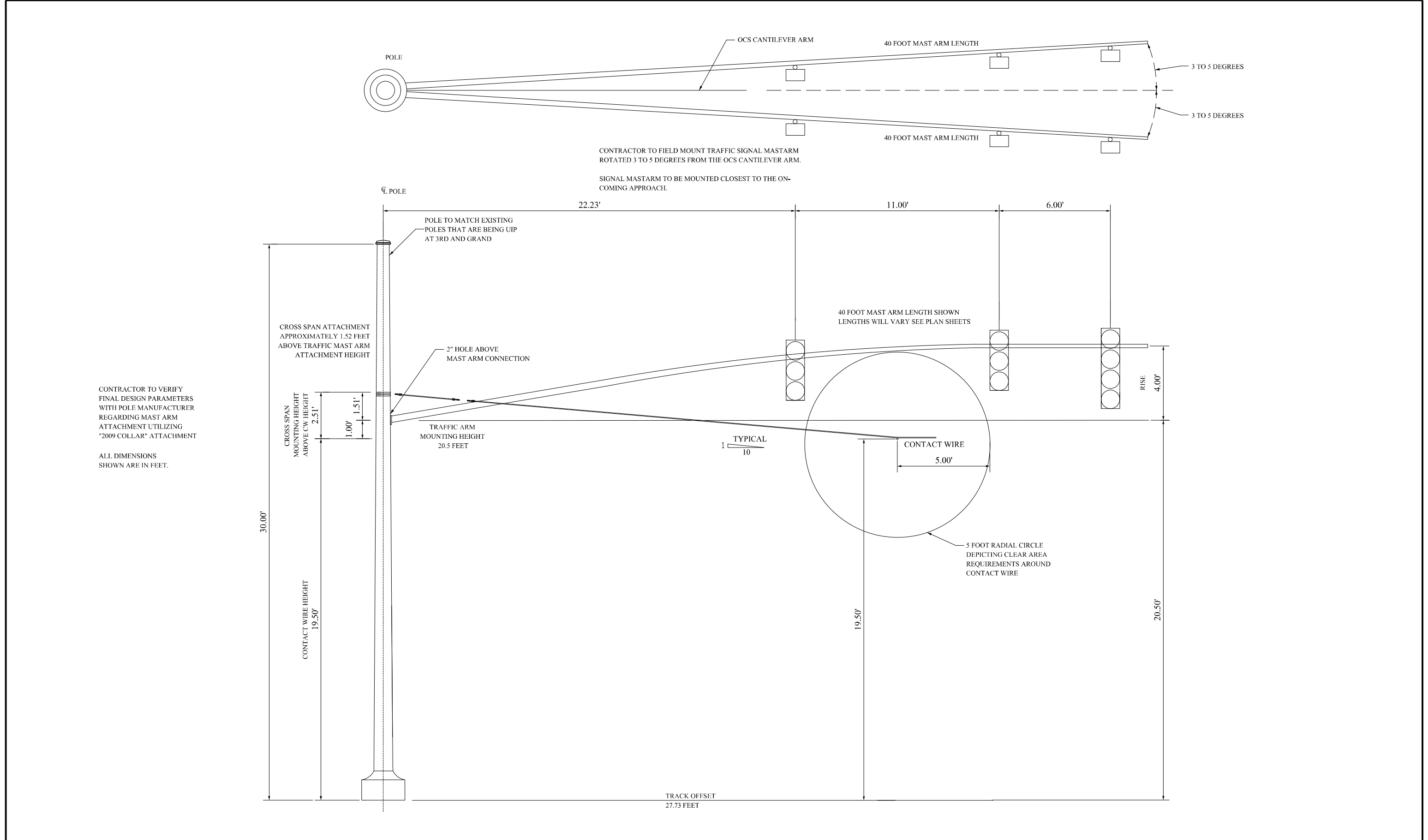
REV	DATE	DESCRIPTION	DESIGNED BY	SMA
			CHECKED BY	JLH
			DRAWN BY	MMO
			CHECKED BY	JLH
			APPROVED BY	NKS
PLOT DATE: 12/23/2022			DATE	12-23-2022



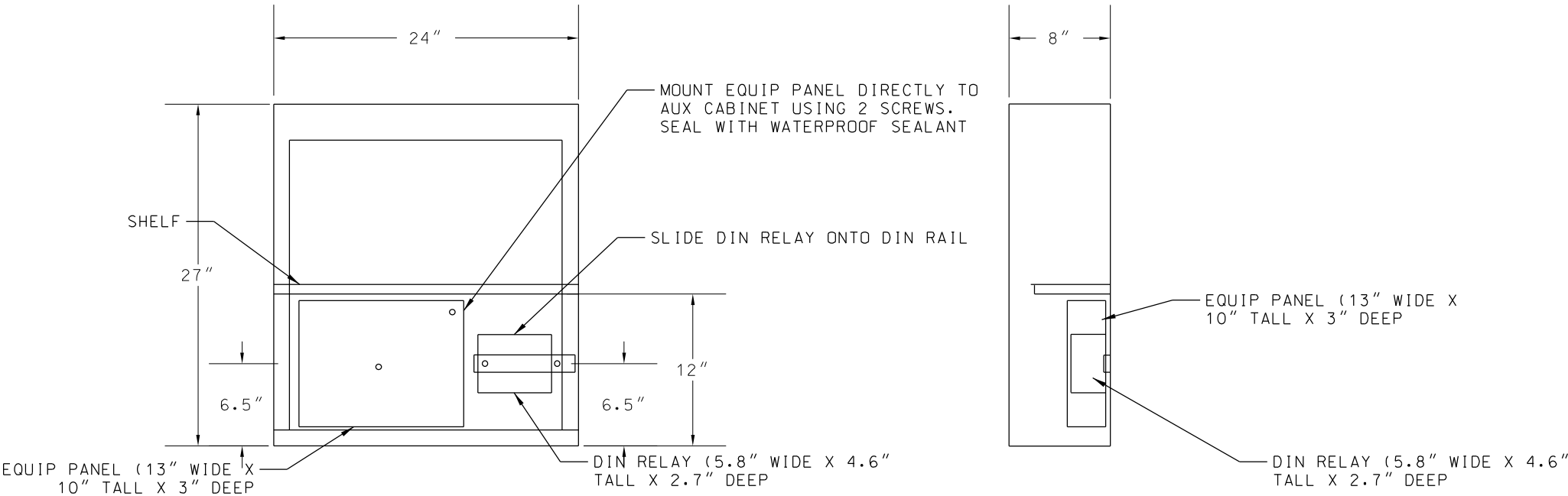
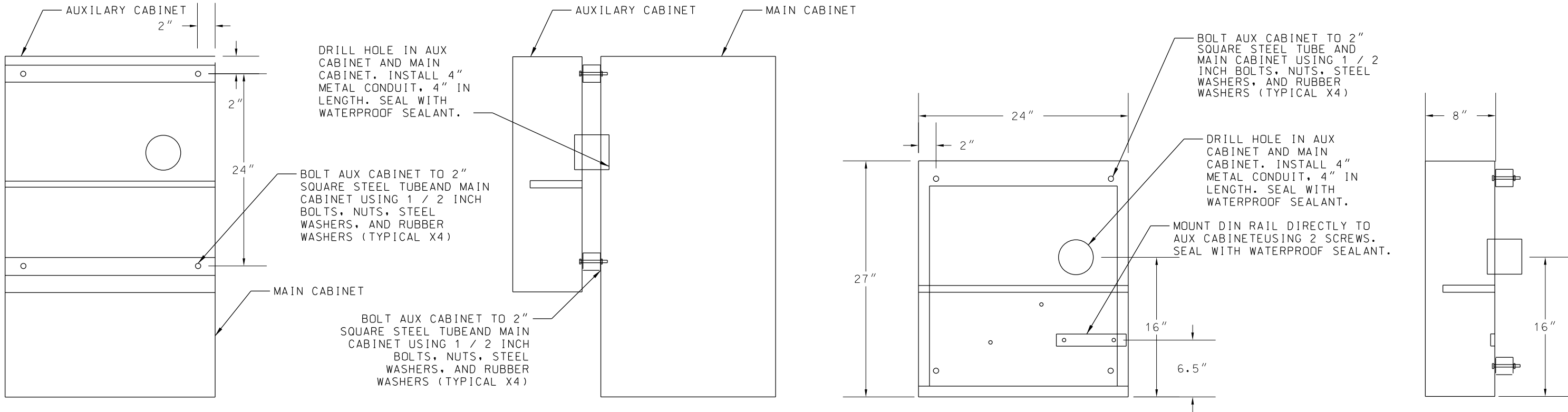
This set of plans is not for construction. These plans are intended to build interest in bidding the project.


ISSUED FOR BID		DATE: 12-23-2022
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		SCALE FOR 22"x34": 1" = 20'
TRAFFIC SIGNAL WIRING DIAGRAM AND PHASING BERKLEY PARKWAY / RIVERFRONT DRIVE		FILENAME: T103B.dgn
		CONTRACT NO.: ***
		VOLUME: 1
DRAWING NO.: T103B	SHEET NO.: 224	

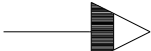


REV	DATE	DESCRIPTION	DESIGNED BY	SMA		<div><div>This set of plans is not for construction. These plans are intended to build interest in bidding the project.</div><div>JASPER P. HENDERSON</div></div>	ISSUED FOR BID		DATE: 12-23-2022	KANSAS CITY STREETCAR - RIVERFRONT EXTENSION			SCALE FOR 22"x34":		
			CHECKED BY	JLH			 HDR Engineering, Inc.						TRAFFIC SIGNAL DETAILS		
			DRAWN BY	MMO			10450 Holmes Road			CROSS SPAN JOINT USE			FILENAME:		
			CHECKED BY	JLH			Suite 600			TRAFFIC/OCS POLE			T201.dgn		
			APPROVED BY	NKS			Kansas City, MO 64131-3471						CONTRACT NO.:		
PLOT DATE: 12/23/2022			DATE		12-23-2022		816-360-2700						CONTRACT NO. ***		
							Certificate of Authority: 000856						VOLUME:		
													DRAWING NO.:		
													SHEET NO.:		
													T201		
													226		




REV	DATE	DESCRIPTION	DESIGNED BY	SMA		<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": H: 1"=20'	
			CHECKED BY	JLH			 HDR Engineering, Inc.	TRAFFIC SIGNAL DETAILS AUXILIARY CABINET MOUNTING DETAIL		FILENAME: T202.dgn		
			DRAWN BY	MMO			10450 Holmes Road Suite 600 Kansas City, MO 64131-3471 816-360-2700 Certificate of Authority: 000856			CONTRACT NO.: CONTRACT NO. ***		
			CHECKED BY	JLH						VOLUME: 1		
			APPROVED BY	NKS						DRAWING NO.: T202		
PLOT DATE: 12/23/2022			10:07:42 AM		DATE	12-23-2022	NOT FOR CONSTRUCTION				SHEET NO.: 227	


TRAFFIC SIGNAL SYMBOLS




OPTICALLY LIMITING TRAFFIC
SIGNAL HEAD



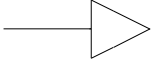
TRAFFIC SIGNAL HEAD




TRAFFIC SIGNAL HEAD WITH BACK PLATE



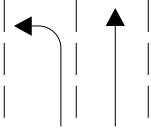
PEDESTRIAN SIGNAL HEAD




EXISTING SIGNAL HEAD




STOP BAR




LANE USE




STEEL POLE




COMBINATION OCS/SIGNAL POLE




MAST ARM POLE



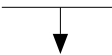
SIGNAL PEDESTAL




CONTROLLER




PULL BOX



SPAN WIRE WITH
SIGNAL HEAD



STREETLIGHT
CONTROLLER




SIGN ON MAST-ARM/POLE



OPTICOM DETECTOR



RADAR DETECTOR



POWER SUPPLY ASSEMBLY



CONDUIT IN TRENCH



CONDUIT PUSHED

3"

SIZE OF CONDUIT

3-2c #14


NUMBER & SIZE OF CABLE



SIGNAL FACE NUMBER



POST NUMBER



PULL BOX NUMBER




SHOEBOX LUMINAIRE



VEHICULAR DETECTION CAMERA

ITS



ITS PULLBOX



TRAIN CABINET

R RED LENS

Y YELLOW LENS

G GREEN LENS

R ← RED LEFT ARROW LENS

Y ← YELLOW LEFT ARROW LENS

G ← GREEN LEFT ARROW LENS

R → RED RIGHT ARROW LENS

Y → YELLOW RIGHT ARROW LENS

G → GREEN RIGHT ARROW LENS

R ↑ RED STRAIGHT ARROW LENS

Y ↑ YELLOW STRAIGHT ARROW LENS

G ↑ GREEN STRAIGHT ARROW LENS

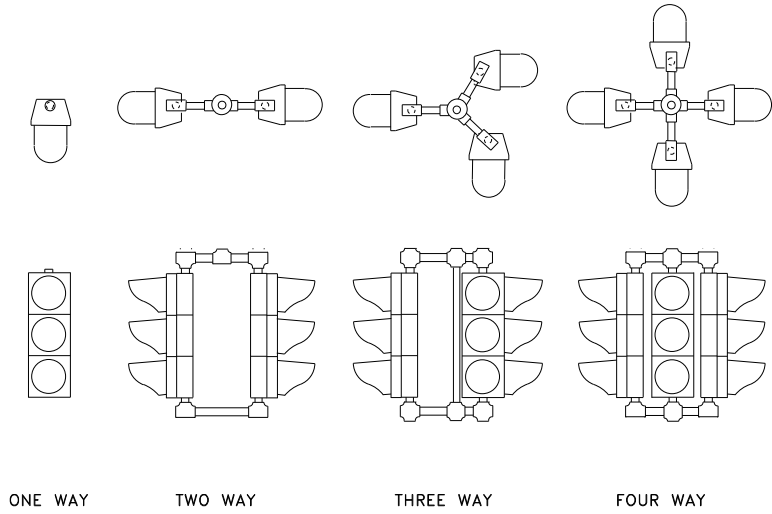
W WALK

DW DON'T WALK

FDW FLASH DON'T WALK

REV	DATE	DESCRIPTION	DESIGNED BY	SMA		<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	JLH			 <div>HDR Engineering, Inc. 10450 Holmes Road Suite 600 Kansas City, MO 64131-3471 816-360-2700 Certificate of Authority: 000856</div>		NOT FOR CONSTRUCTION				NOT TO SCALE	
			DRAWN BY	MMO							FILENAME:			
			CHECKED BY	JLH							T203.dgn			
			APPROVED BY	NKS							CONTRACT NO.:			
											CONTRACT NO. ***			
					VOLUME:									
PLOT DATE: 12/23/2022			10:07:44 AM		DATE	12-23-2022					DRAWING NO.:		SHEET NO.:	
											T203		228	

TRAFFIC SIGNAL HEAD DETAILS

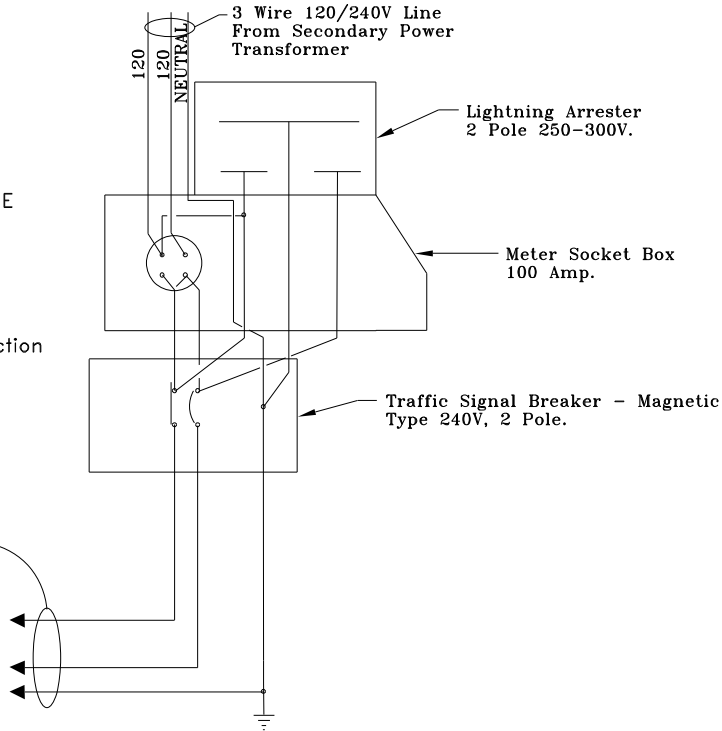


SPAN WIRE MOUNT
OVERHEAD BRACKETS

SIDE MOUNT
ONE WAY BRACKETS

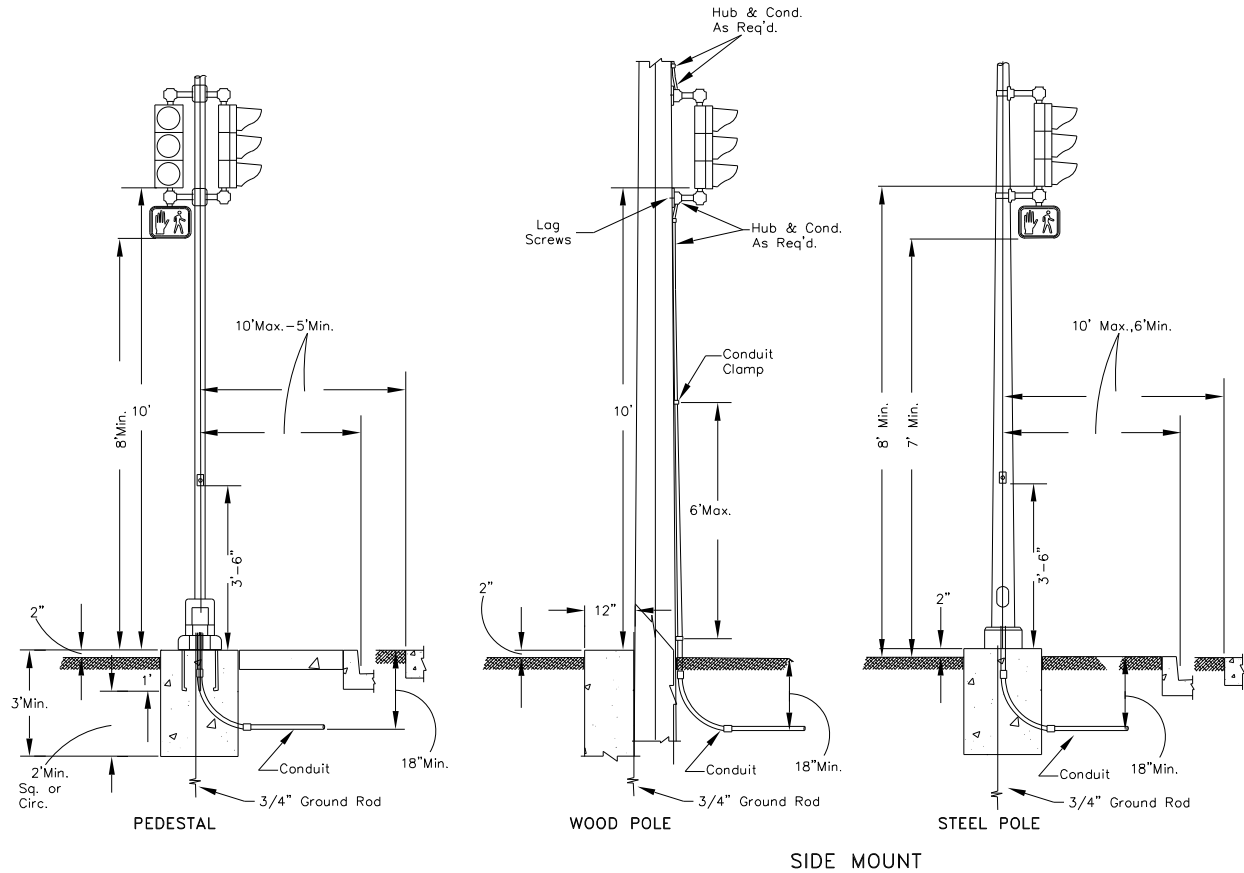
SIDE MOUNT
TWO WAY BRACKETS

- SWITCHING CABLE WIRING COLOR CODE
(Load Relays To Signal Heads)
- Traffic Signal Head
1. Red to Red Signal Section
 2. Orange to Yellow Signal Section
 3. Green to Green Signal Section
 4. Black to Flashing Yellow Arrow Section
- Pedestrian Signal Head
1. Red to "Don't Walk" Section
 2. Green to "Walk" Section



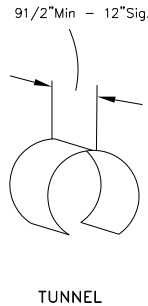
POWER SUPPLY ASSEMBLY CIRCUIT

POWER SUPPLY AND POWER MONITOR WIRING AND SWITCHING WIRING COLOR CODE

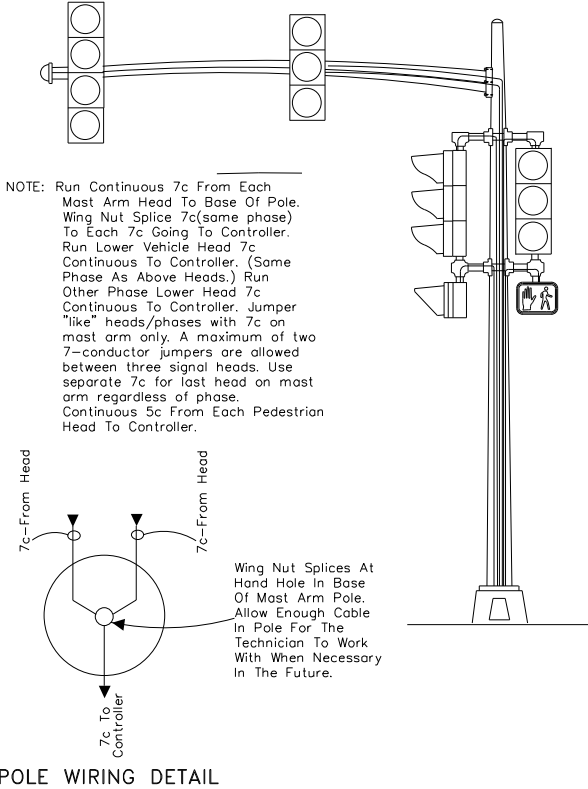


NOTES

1. All Post Wire Outlets To Be Equipped With Bushings.
2. Side Mounted Optically Limiting Heads Shall Have A Post Clearance Of 5-1/2 inches.
3. Conventional Vehicles And Pedestrian Heads Are Of Polycarbonate Materials.
4. Contractor To Furnish And Install All Lamps Per Specifications.



VISOR



REV	DATE	DESCRIPTION	DESIGNED BY	SMA
			CHECKED BY	JLH
			DRAWN BY	MMO
			CHECKED BY	JLH
			APPROVED BY	NKS
PLOT DATE: 12/23/2022			DATE	12-23-2022



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

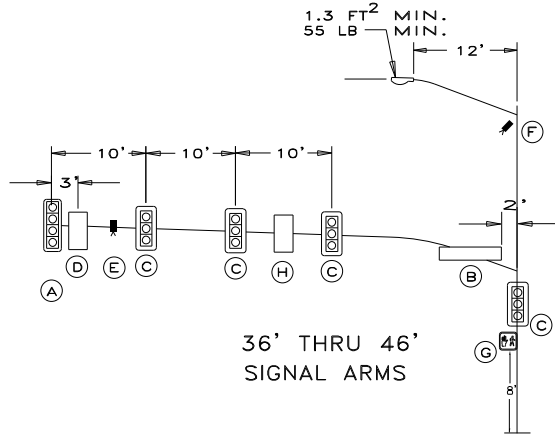
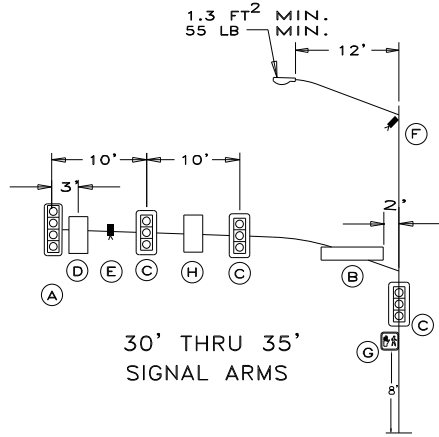
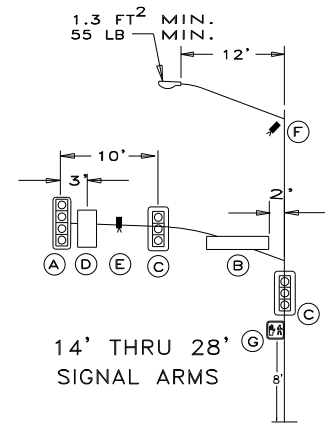
ISSUED FOR BID	DATE: 12-23-2022
HDR HDR Engineering, Inc. 10450 Holmes Road Suite 600 Kansas City, MO 64131-3471 816-360-2700 Certificate of Authority: 000856	
NOT FOR CONSTRUCTION	

KANSAS CITY STREETCAR - RIVERFRONT EXTENSION

TRAFFIC SIGNAL
SIGNAL DETAILS

SCALE FOR 22"x34": NOT TO SCALE	FILENAME: T204.dgn
CONTRACT NO.: CONTRACT NO. ***	VOLUME:
DRAWING NO.: T204	SHEET NO.: 229

TRAFFIC SIGNAL MAST ARM DETAILS

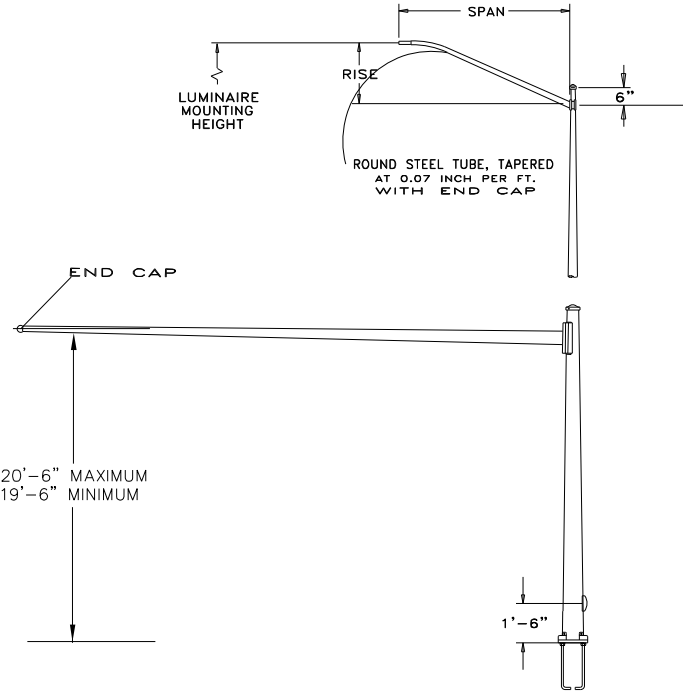
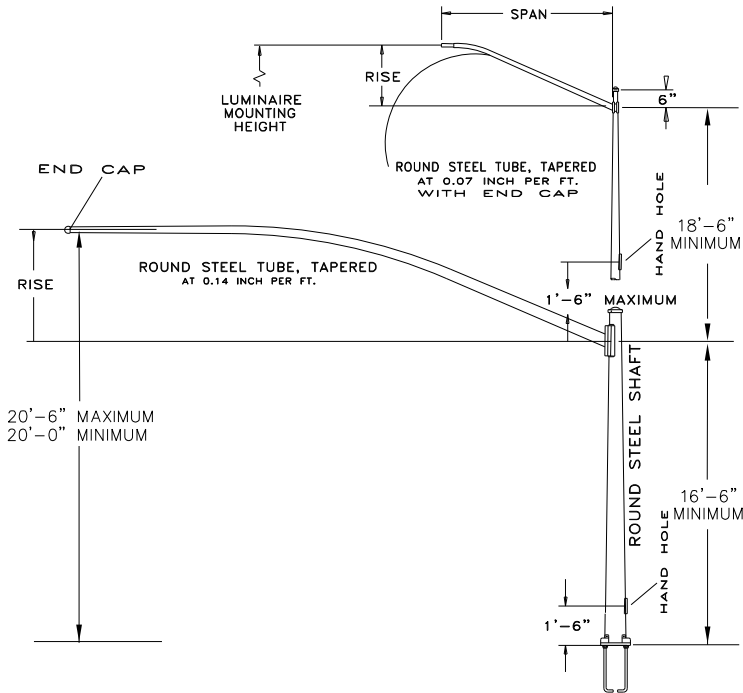


DEVICE	DESCRIPTION
(A)	12"-4 SEC. SIGNAL WITH BACKPLATE (70 lb minimum)
(B)	ILLUMINATED STREET NAME SIGN (120" x 18"; 125 lb minimum)
(C)	12"-3 SEC. SIGNAL WITH BACKPLATE (50 lb minimum)
(D)	ILLUMINATED REGULATORY SIGN (30" x 36"; 50 lb minimum)
(E)	DETECTION/WIRELESS EQUIPMENT (12" x 18"; 20 lb minimum)
(F)	PAN,TILT AND ZOOM CAMERA (12" x 18"; 20 lb minimum)
(G)	Dual Ped. Signals (18" x 22"; 25 lb minimum/signal)
(H)	ILLUMINATED REGULATORY SIGN (24" x 30"; 30 lb minimum)

MAST ARM LOADING INFORMATION

GENERAL NOTES

- 1) ALL POLES, ARMS AND MISCELLANEOUS EQUIPMENT SHALL CONFORM WITH THESE DETAILS AND THE LATEST EDITION OF THE RELEVANT KCMO STANDARD SPECIFICATIONS.
- 2) ALL STRUCTURES TO MEET THE DESIGN CRITERIA OF THE 2009 OR LATEST AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS FOR 90 M.P.H. WIND ZONE WITH A 50 YEAR RECURRENCE INTERVAL, APPROPRIATE FATIGUE CATEGORY, GALLOPING AND TRUCK INDUCED LOADS.
- 3) ALL SHOP DRAWINGS FOR EQUIPMENT TO BE USED SHALL BE SIGNED AND SEALED BY A PROFESSIONAL ENGINEER AND APPROVED BY THE PROJECT MANAGER OR HIS/HER AUTHORIZED REPRESENTATIVE PRIOR TO ORDERING EQUIPMENT.
- 4) ALL CIRCUIT CABLES IN PULL BOXES, CONTROLLERS AND POLES SHALL BE IDENTIFIED WITH COLOR TAPES PER STANDARD SPECIFICATION (FOR CIRCUIT LABELING, SEE SPECIFICATION).
- 5) ALL OPENINGS IN POLES, POSTS, BRACKETS, ETC. TO BE CAPPED WATER TIGHT. POLE CAPS, END CAPS AND HAND HOLE COVERS SHALL BE SECURED TO THE POLE/ARM WITH A NO. 12 STAINLESS STEEL SINGLE JACK CAPTIVE CHAIN USING 0.19" x 0.50" POP RIVETS.
- 6) HAND HOLES SHALL HAVE A 5.50" HORIZONTAL OPENING AND 11.00" VERTICAL OPENING
- 7) MAST ARM DESIGN SHALL ENSURE THAT THE BOTTOM OF THE SIGNAL HOUSING, SIGNS AND ANY RELATED ATTACHMENTS LOCATED OVER ANY PORTION OF A STREET OR HIGHWAY THAT CAN BE USED BY MOTOR VEHICLES SHALL BE BETWEEN 16 FEET AND 19 FEET ABOVE THE PAVEMENT.
- 8) 3.00" x 5.00" ALUMINUM ID TAGS SHALL BE SECURED TO THE SHAFTS WITH 4 - 0.19" RIVETS AT 12" ABOVE LOWER HANDHOLE AND TO THE BACK OF THE MAST ARM AT 12" FROM THE SIGNAL ARM ATTACHMENT. ID TAGS SHALL BE STAMPED WITH INFORMATION ABOUT MANUFACTURER, DATE OF MANUFACTURE, SHOP DRAWING NUMBER, P.O NUMBER, DESIGNATION, ANCHOR/CONNECTING BOLT CIRCLE/DIAMETER AND SPACING, AND SIMPLEX PLATE ANGLE, AS REQUIRED BY THE CITY. ALL TEXT TO BE A MINIMUM OF 0.15" IN HEIGHT.



KANSAS CITY, MISSOURI POLE SERIES

MANUFACTURER	DATE OF MANUFACTURE
SHOP DRAWING NO.	PURCHASE ORDER NO.
DESIGNATION	
CONNECTING BOLT SPACING OR ANCHOR BOLT CIRCLE	CONNECTING BOLT DIA. OR ANCHOR BOLT DIA.
SIMPLEX PLATE ANGLE	

I.D TAG EXAMPLE

KC - 16.5 - 15 - 30 - 6 - GV

POLE FINISH (GV-GALVANIZED, PG-POWDER COATED OVER GALVANIZING, COLOR TO BE DETERMINED)

LUMINAIRE ARM SPAN WHEN REQUIRED (6, 8, 10, 12, 15)

LUMINAIRE MOUNTING HEIGHT WHEN REQUIRED (NL, SP, 30, 40)

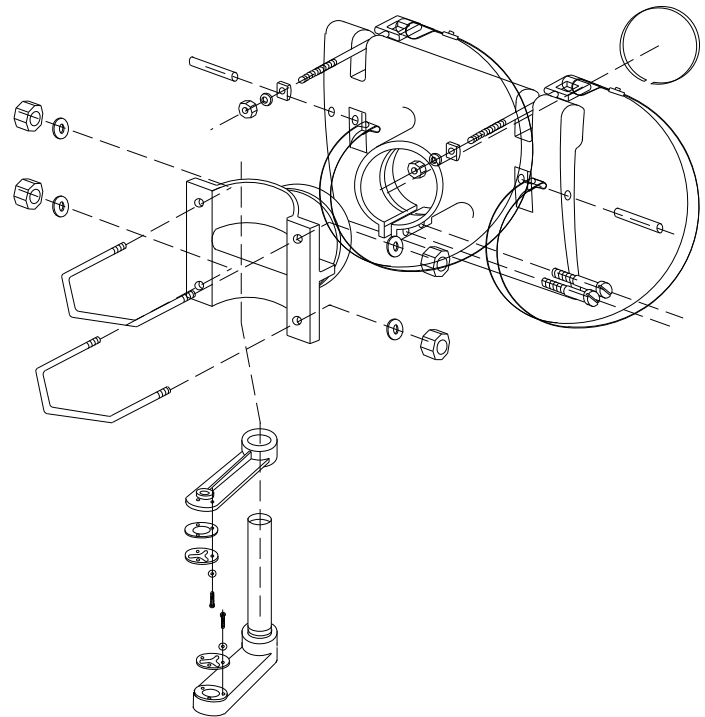
SIGNAL ARM SPAN (15, 20, 25, 30, 35, 40, 45, 50)

SIGNAL ARM MOUNTING HEIGHT (16, 16.5, 17)

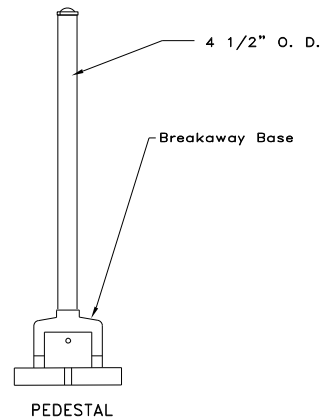
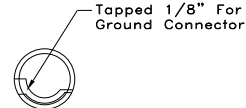
KANSAS CITY POLE SERIES (KCS FOR STRAIGHT MAST ARM POLES)

DESIGNATION EXAMPLE

TYPE II BRACKET

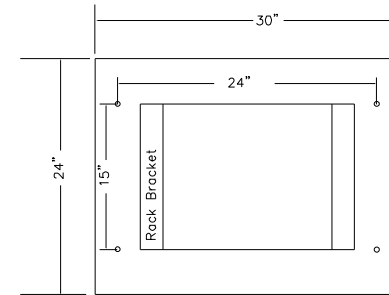
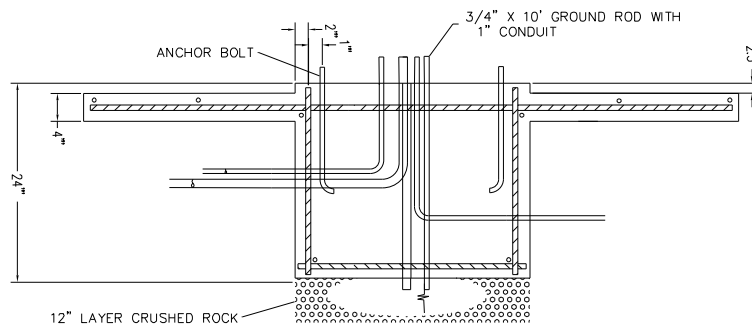
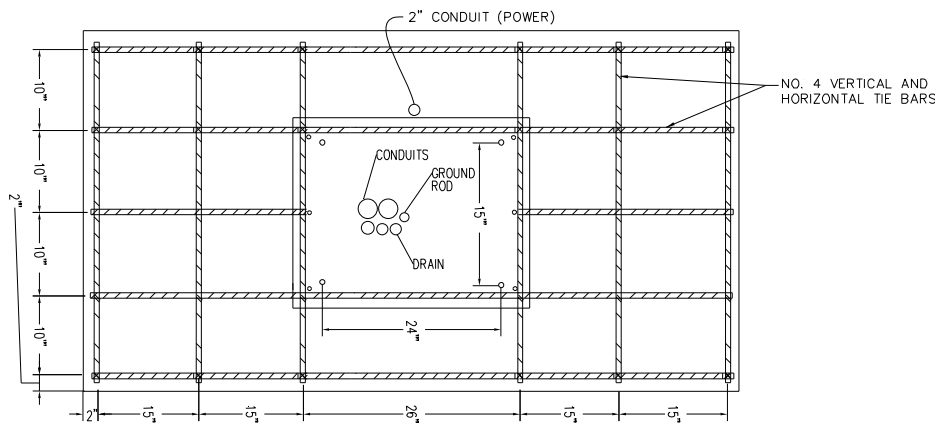
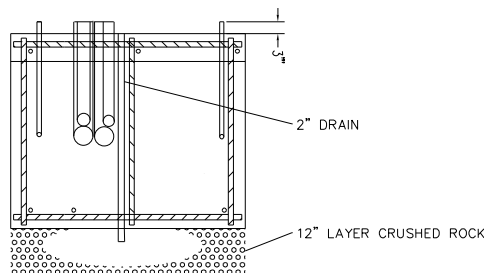
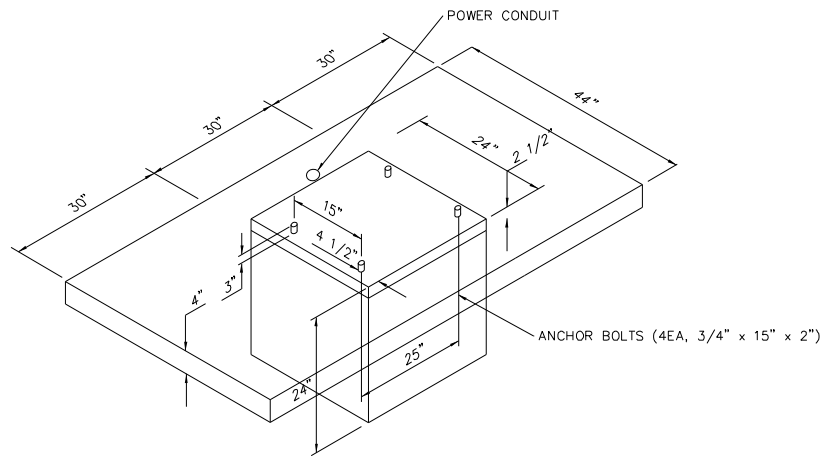


DETAIL A
SIGNAL HANGER W/ ASTRO-BRAC ASSY. CABLE MOUNT

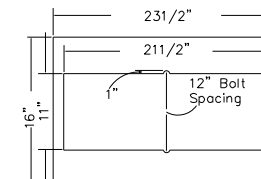


REV	DATE	DESCRIPTION	DESIGNED BY	SMA		<p>This set of plans is not for construction. These plans are intended to build interest in bidding the project.</p>	ISSUED FOR BID	DATE: 12-23-2022	KANSAS CITY STREETCAR - RIVERFRONT EXTENSION	<p>TRAFFIC SIGNAL SIGNAL DETAILS SIGNAL MAST ARM DETAILS</p>	SCALE FOR 22"x34": NOT TO SCALE	
			CHECKED BY	JLH				10450 Holmes Road Suite 600 Kansas City, MO 64131-3471 816-360-2700 Certificate of Authority: 000856			FILENAME:	
			DRAWN BY	MMO							T205.dgn	
			CHECKED BY	JLH							CONTRACT NO.:	
			APPROVED BY	NKS							CONTRACT NO.***	
PLOT DATE: 12/23/2022			10:07:49 AM		DATE	12-23-2022	NOT FOR CONSTRUCTION		DRAWING NO.:	T205	SHEET NO.:	230

TRAFFIC SIGNAL CONCRETE BASE DETAILS



BASE PATTERN TYPE 332



DOOR TYPE 336

NOTES:

1. TOP OF PAD TO BE SLOPED TO DRAIN.
2. NON-HARDENING DUCT SEALANT TO BE APPLIED TO CONDUIT ENTRANCES.
3. PROVIDE WATERTIGHT SEAL BETWEEN THE CONTROLLER CABINET AND THE CONCRETE PAD.
4. CONTROLLER PAD TO BE EXCAVATED AND FORMED TO THE DIMENSIONS SHOWN WITHOUT DISTURBING THE AREAS OF ADJACENT SUBGRADE.
5. THE ENGINEER IN CHARGE OF CONSTRUCTION SHALL DETERMINE THE ORIENTATION OF THE CONTROLLER PAD.
6. ALL CONDUITS AND BOLTS SHALL BE RIGIDLY INSTALLED BEFORE PLACEMENT OF CONCRETE.
7. ANCHOR BOLTS SHALL BE SPACED USING MANUFACTURED SUPPLIED TEMPLATE, CENTERED TO COINCIDE WITH THE CENTER OF THE BASE. TO ALLOW FOR CENTERING OF THE POWER CONTROL CABINET ON THE SIDE OF THE SIGNAL CONTROL BOX.

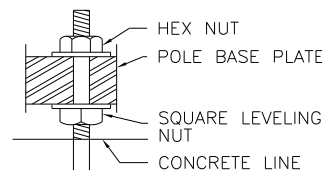
TRAFFIC SIGNAL CONTROLLER PAD DETAILS

TYPE 'A' BASE

DIMENSIONS

DIMENSIONS BY MOUNTING HEIGHTS

NO.	ITEM	25'	30'	35'	40'
①	BOLT SPACING	7-3/8"	7-3/4"	8-1/8"	8-1/2"
②	MIN. DIAMETER OF FOUNDATION	21"	22"	23"	24"
③	DEPTH OF FOUNDATION	5'-0"	6'-0"	7'-0"	8'-0"
④	BOLT CIRCLE DIAMETER	10-1/2"	11"	11-1/2"	12"

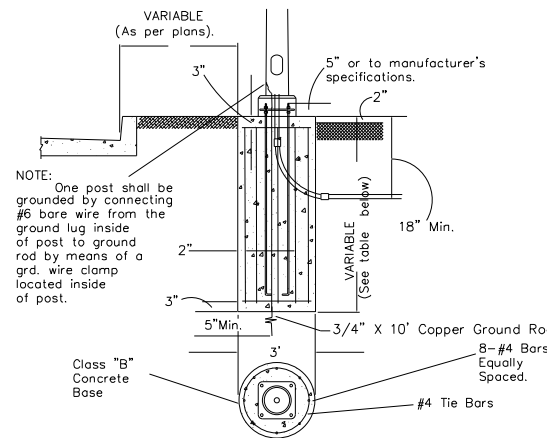
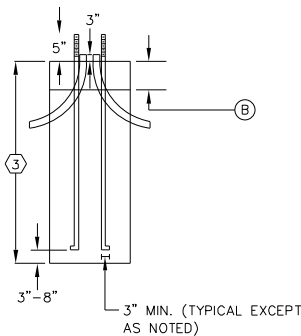
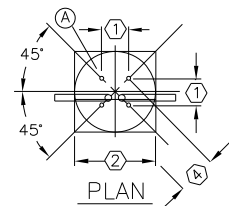


STREET LIGHT FOUNDATIONS

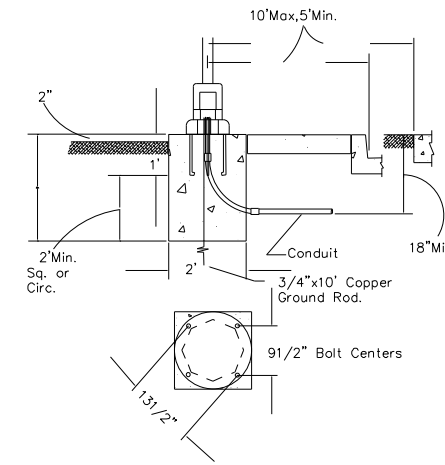
- Ⓐ ANCHOR BOLTS.
- Ⓑ 6" CAP TO BE POURED AFTER POLE IS ERECTED AND PLUMBED.

GENERAL NOTES FOR ALL BASES

- 1) ANCHOR BOLTS TO BE HOT-DIP GALVANIZED. (SEE SPECIFICATION.)
- 2) ANCHOR BOLTS TO BE HOT-DIP GALVANIZED. (SEE SPECIFICATION.)
- 3) BOTTOM ENDS OF ANCHOR BOLTS MUST HAVE 3" MINIMUM CONCRETE COVER.
- 4) USE BOLT POSITIONING JIF OF SUFFICIENT WEIGHT & STRENGTH TO MAINTAIN ACCURATE ANCHOR BOLT LOCATION DURING CONCRETE PLACEMENT.
- 5) CITY-AUTHORIZED INSPECTOR MUST INSPECT EACH EXCAVATION, WITH ALL FORMS, ANCHOR BOLTS, REINFORCING STEEL, CONDUIT, & CONDUIT PLUGS IN PLACE IMMEDIATELY PRIOR TO PLACING CONCRETE.
- 6) CONCRETE FOR FOUNDATIONS: MCIB AIR-ENTRAINED MIX NO. A-629-1/2-2.
- 7) FOUNDATIONS IN EARTH TO BE 1" ABOVE ANY ADJACENT EARTH & HAVE EDGES BEVELED.
- 8) FOR TYPE "A", TIE ANCHOR BOLTS NEAR THE BOTTOM. USE TWO #3 REBAR HOOPS SPACED 12", TWO #3 REBAR "U" 'S SPACED 12", OR TWO TURNS OF #3 REBAR SPIRAL WITH 12" PITCH.
- 9) EXPANSION JOINT TO BE USED WHERE PAVING ADJOINS FOUNDATION.
- 10) PLUG ALL CONDUIT OPENINGS WITH DUXSEAL OR EQUIVALENT BEFORE PLACING CONCRETE & AFTER CABLE INSTALLATION. SEE PLANS FOR NUMBER AND DIRECTION OF BENDS.
- 11) 6" CAP TO BE POURED AFTER POLE IS ERECTED AND PLUMBED.



TYPICAL B8, B10, & B12



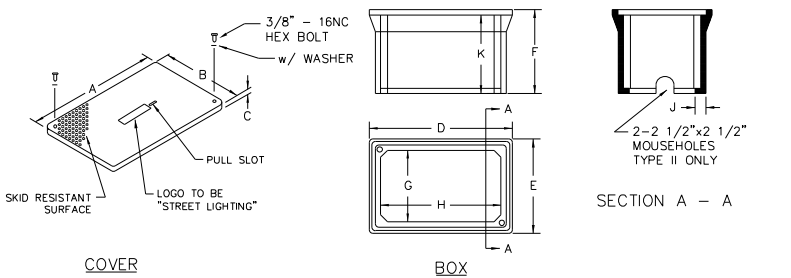
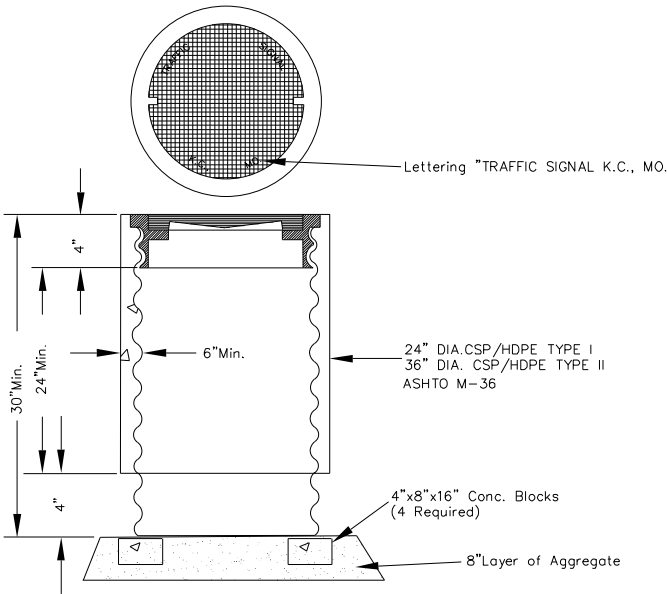
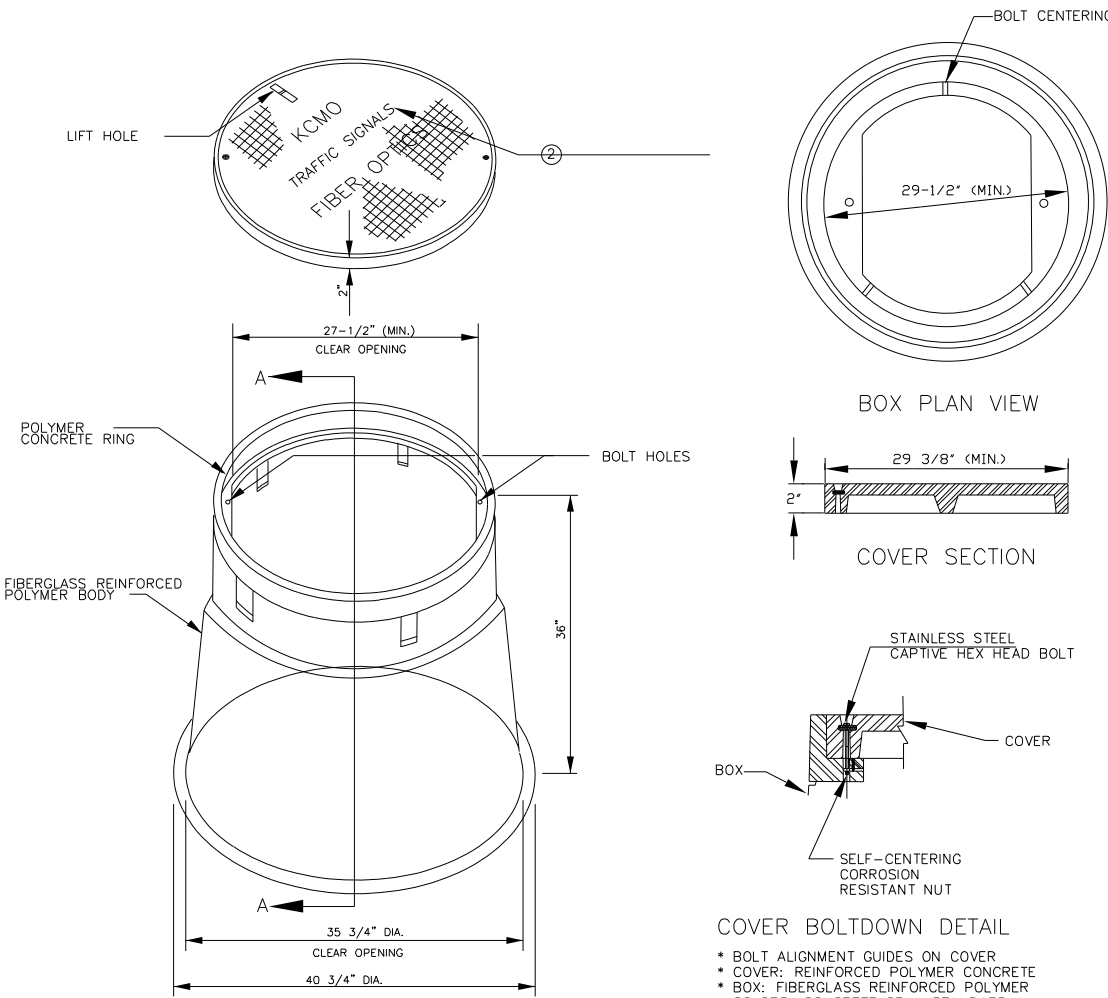
TYPE C

BASES

BASE TYPE	DEPTH	DIA.	ARM LENGTH	CONC. IN C.Y.	REMARKS
B8	8 FT.	3 FT.	Up to 28 FT.	2.09	
B10	10 FT.	3 FT.	29 FT. to 35 FT.	2.61	
B12	12 FT.	3 FT.	36 FT. to 46 FT.	3.14	

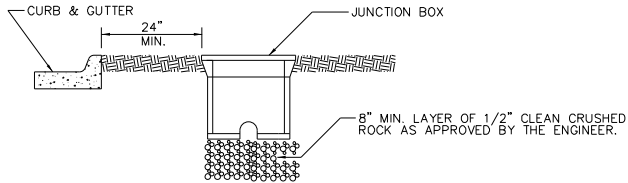
REV	DATE	DESCRIPTION	DESIGNED BY	SMA		<p>This set of plans is not for construction. These plans are intended to build interest in bidding the project.</p>	ISSUED FOR BID	DATE: 12-23-2022	KANSAS CITY STREETCAR - RIVERFRONT EXTENSION	<p>TRAFFIC SIGNAL SIGNAL DETAILS SIGNAL CONCRETE BASE DETAILS</p>	SCALE FOR 22"x34": NOT TO SCALE	
			CHECKED BY	JLH				10450 Holmes Road Suite 600 Kansas City, MO 64131-3471 816-360-2700 Certificate of Authority: 000856			NOT FOR CONSTRUCTION	FILENAME: T206.dgn
			DRAWN BY	MMO								CONTRACT NO.: CONTRACT NO. ***
			CHECKED BY	JLH								VOLUME:
			APPROVED BY	NKS								DRAWING NO.: SHEET NO.:
PLOT DATE: 12/23/2022			10:07:52 AM		DATE	12-23-2022			T206	231		

TRAFFIC SIGNAL PULL BOX DETAILS



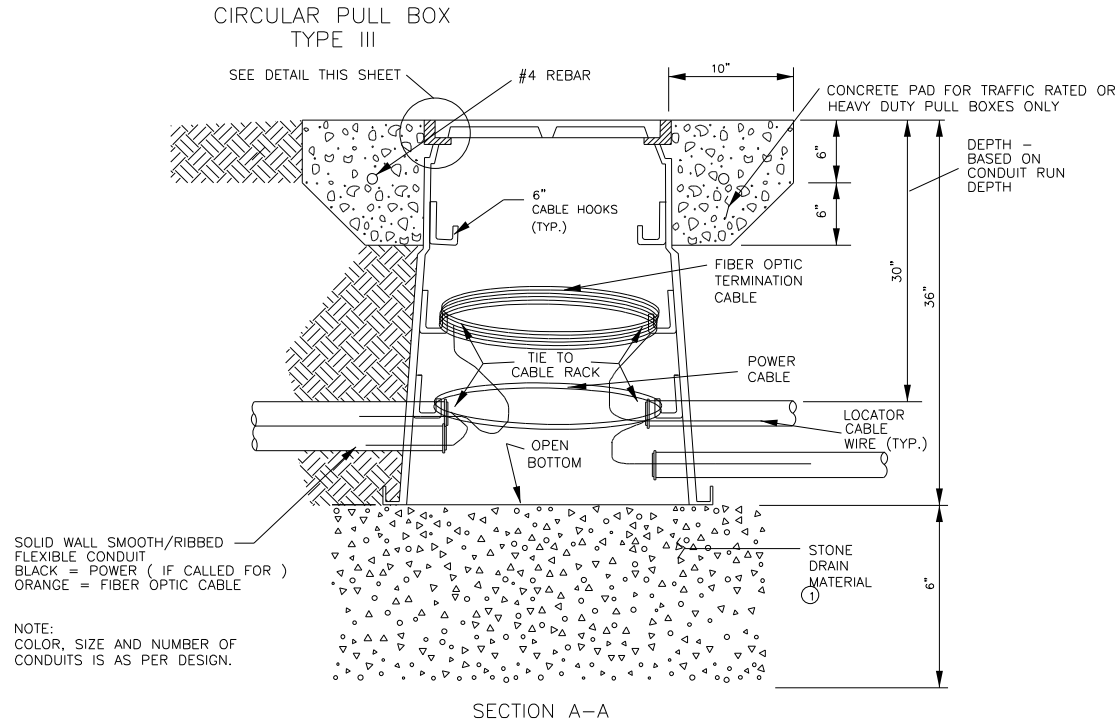
TYPE	DIMENSIONS (IN.) *									
	A	B	C	D	E	F	G	H	J	K
I	12 7/8	12 7/8	3/4	14	14	12 3/4	10 1/2	10 1/2	1	12
II	18 1/2	11 1/2	3/4	20 1/2	13 1/2	12	10 1/4	17 1/4	3/8	11 1/4

* TOLERANCE ±1/4" IN ANY DIMENSION



JUNCTION BOX INSTALLATION DETAIL

FIBERGLASS REINFORCED POLYMER CONCRETE JUNCTION BOX DETAILS NOT TO SCALE



- ① AGGREGATE SHALL CONFORM TO RELEVANT KCMO STANDARD SPECIFICATIONS.
- ② CIRCULAR PULL BOX COVERS SHALL BE EMBOSSED "KCMO FIBER OPTICS". TEXT SHALL BE 4" IN HEIGHT AND CENTERED.

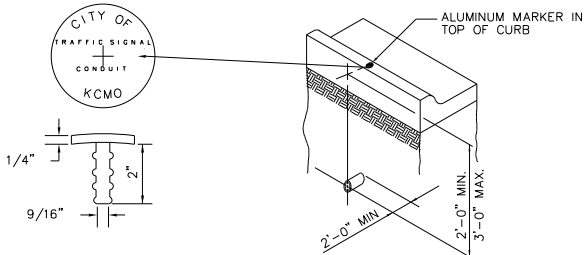
GENERAL NOTES:

PULLBOX FRAMES AND COVERS SHALL BE POLYMER CONCRETE.

PULLBOX COVERS SHALL HAVE AN APPROVED WHEEL LOAD OF 20,000 LBS AND BE UV STABILIZED.

IF SUBSURFACE CONDITIONS EXIST WHICH PROHIBIT THE PLACEMENT OF THE GROUND ROD IN A VERTICAL POSITION, THE ROD MAY BE DRIVEN AT AN OBLIQUE ANGLE NOT TO EXCEED 45 DEGREES FROM VERTICAL OR BURIED IN A TRENCH AT LEAST 30 IN. DEEP. CONNECTION TO GROUND ROD SHALL BE CADWELDED.

THE CIRCULAR PULL BOX COVER SHOULD BE SIZED TO FIT A BOX WITH A MINIMUM CLEAR OPENING OF 34 3/4 INCHES.



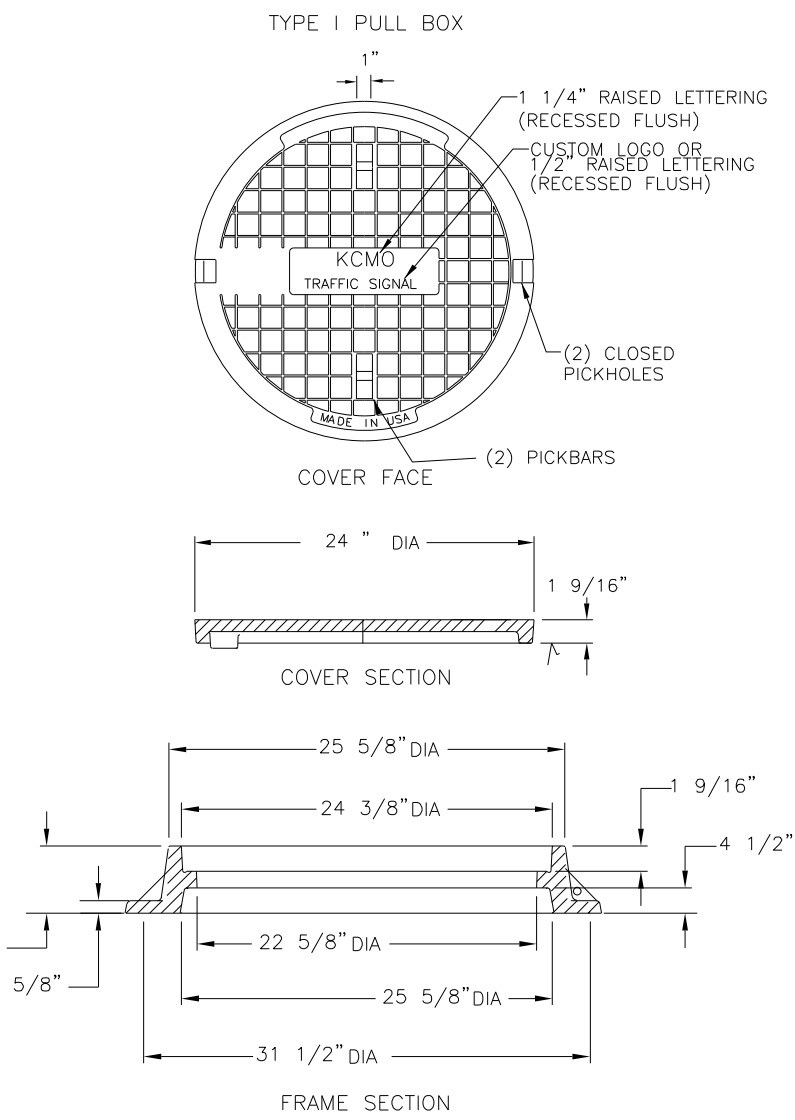
CONDUIT SHALL BE PLACED 2'-0" TO 3'-0" BELOW THE TOP OF CURB ELEVATION AND SHALL EXTEND 2'-0" MINIMUM BEYOND THE BACK OF CURB. CONDUIT SHALL BE INSTALLED TO DRAIN, AND ALL ENDS SHALL BE THREADED AND CAPPED. AN ALUMINUM MARKER SHALL BE COUNTER SUNK IN THE TOP OF THE CURB DIRECTLY OVER THE CONDUIT. ALUMINUM MARKERS WILL BE FURNISHED BY THE CONTRACTOR.

THE CONTRACTOR SHALL NOTIFY THE CITY OF KANSAS CITY, DEPARTMENT OF PUBLIC WORKS TRAFFIC DIVISION (816) 513-9870 FOR INSPECTION OF THE CONDUIT INSTALLATION. AT LEAST 24 HOURS NOTICE SHALL BE PROVIDED. THE CONDUIT SHALL NOT BE COVERED UNLESS INSPECTED AND APPROVED BY THE PROJECT ENGINEER OR HIS AUTHORIZED REPRESENTATIVE, SO AS TO ENSURE PROPER DEPTH, CORRECT CONDUIT MATERIAL, AND PROPER CONDUIT END TREATMENT AS DESCRIBED ABOVE.

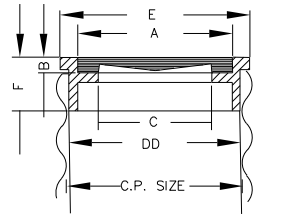
CONDUIT MARKING DETAIL

REV	DATE	DESCRIPTION	DESIGNED BY	SMA		<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	
			CHECKED BY	JLH					HDR Engineering, Inc.		TRAFFIC SIGNAL		FILENAME: T207.dgn	
			DRAWN BY	MMO			10450 Holmes Road		Suite 800		SIGNAL DETAILS		CONTRACT NO.: CONTRACT NO. ***	
			CHECKED BY	JLH			10450 Holmes Road		Suite 800		SIGNAL PULL BOX DETAILS		VOLUME:	
			APPROVED BY	NKS			Kansas City, MO 64131-3471		816-360-2700				DRAWING NO.: SHEET NO.:	
PLOT DATE: 12/23/2022			10:07:54 AM		DATE	12-23-2022	NOT FOR CONSTRUCTION						T207 232	

TRAFFIC SIGNAL PULL BOX DETAILS

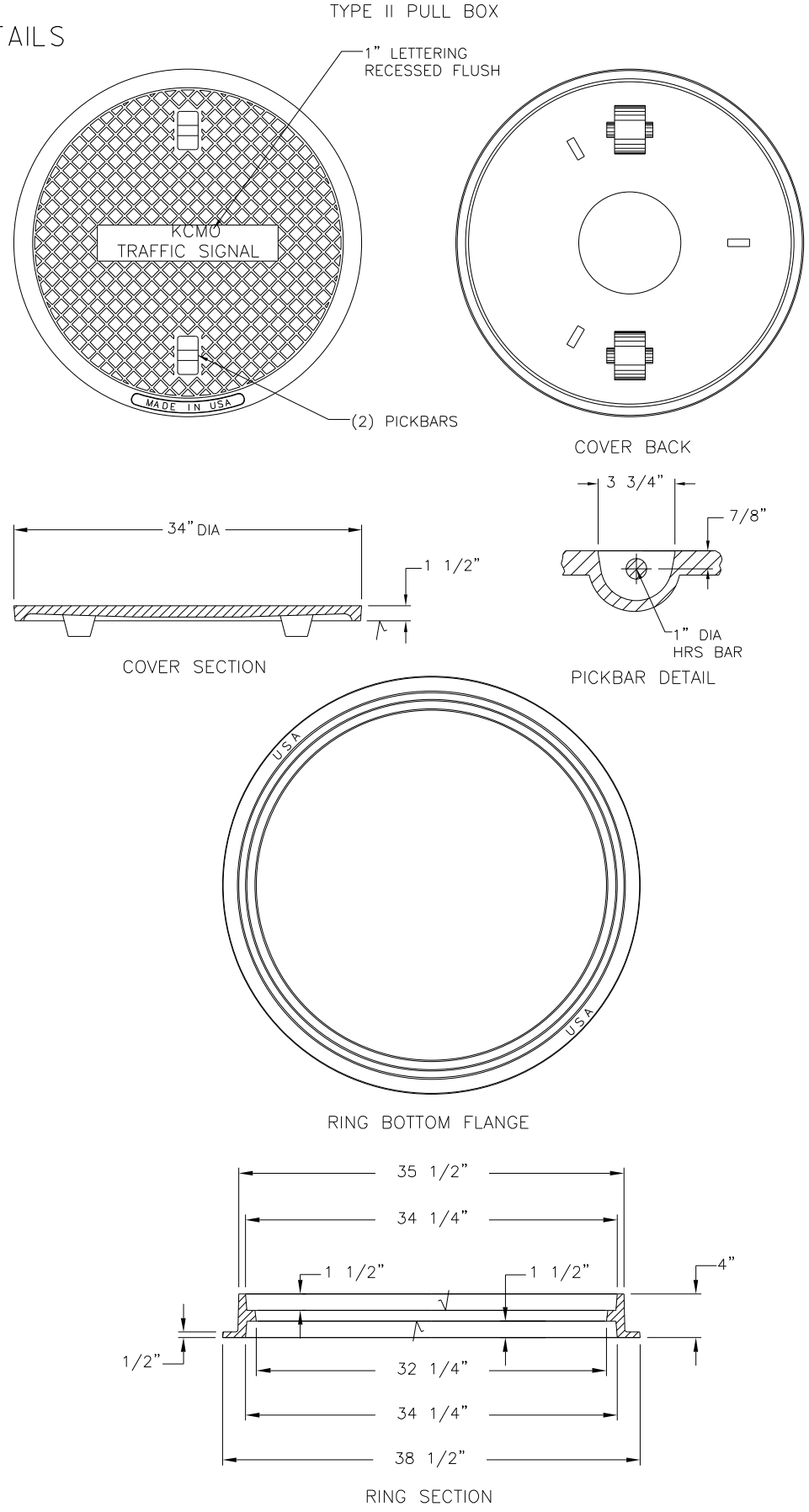


The above ring and lid dimensions for Type 1 pull boxes are applicable if installed within a traveled way. If Type 1 pull boxes are installed within a grass area, the following ring (reversible) and lid dimensions can be used.



Dimensions in Inches

Pipe Size	A	B	C	DD	E	F
24	22 1/2	1 1/2	20 1/2	23 1/2	26 1/2	4



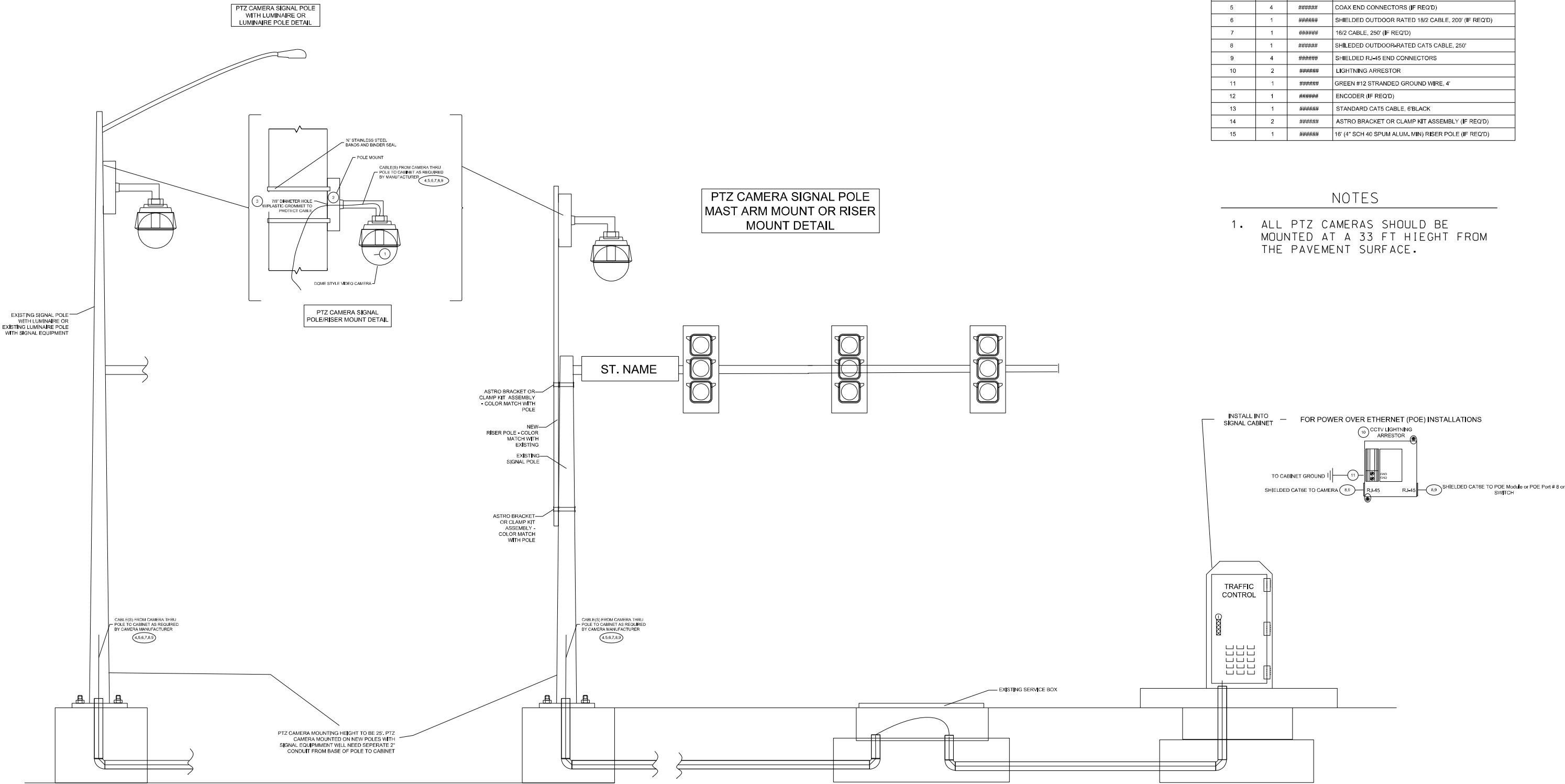
REV	DATE	DESCRIPTION	DESIGNED BY	SMA		<div>This set of plans is not for construction. These plans are intended to build interest in bidding the project.</div>	ISSUED FOR BID	DATE: 12-23-2022	<div>KANSAS CITY STREETCAR - RIVERFRONT EXTENSION</div> <div>TRAFFIC SIGNAL SIGNAL DETAILS SIGNAL PULL BOX DETAILS</div>		SCALE FOR 22"x34": NOT TO SCALE	
			CHECKED BY	JLH			 <div>HDR Engineering, Inc. 10450 Holmes Road Suite 600 Kansas City, MO 64131-3471 816-360-2700 Certificate of Authority: 000856</div>				FILENAME: T208.dgn	
			DRAWN BY	MMO							CONTRACT NO.:	
			CHECKED BY	JLH							CONTRACT NO. ***	
			APPROVED BY	NKS							VOLUME:	
PLOT DATE: 12/23/2022			10:07:56 AM		DATE	12-23-2022	NOT FOR CONSTRUCTION		DRAWING NO.:	SHEET NO.:		
											T208	233


TRAFFIC SIGNAL PTZ CAMERA INSTALL DETAILS

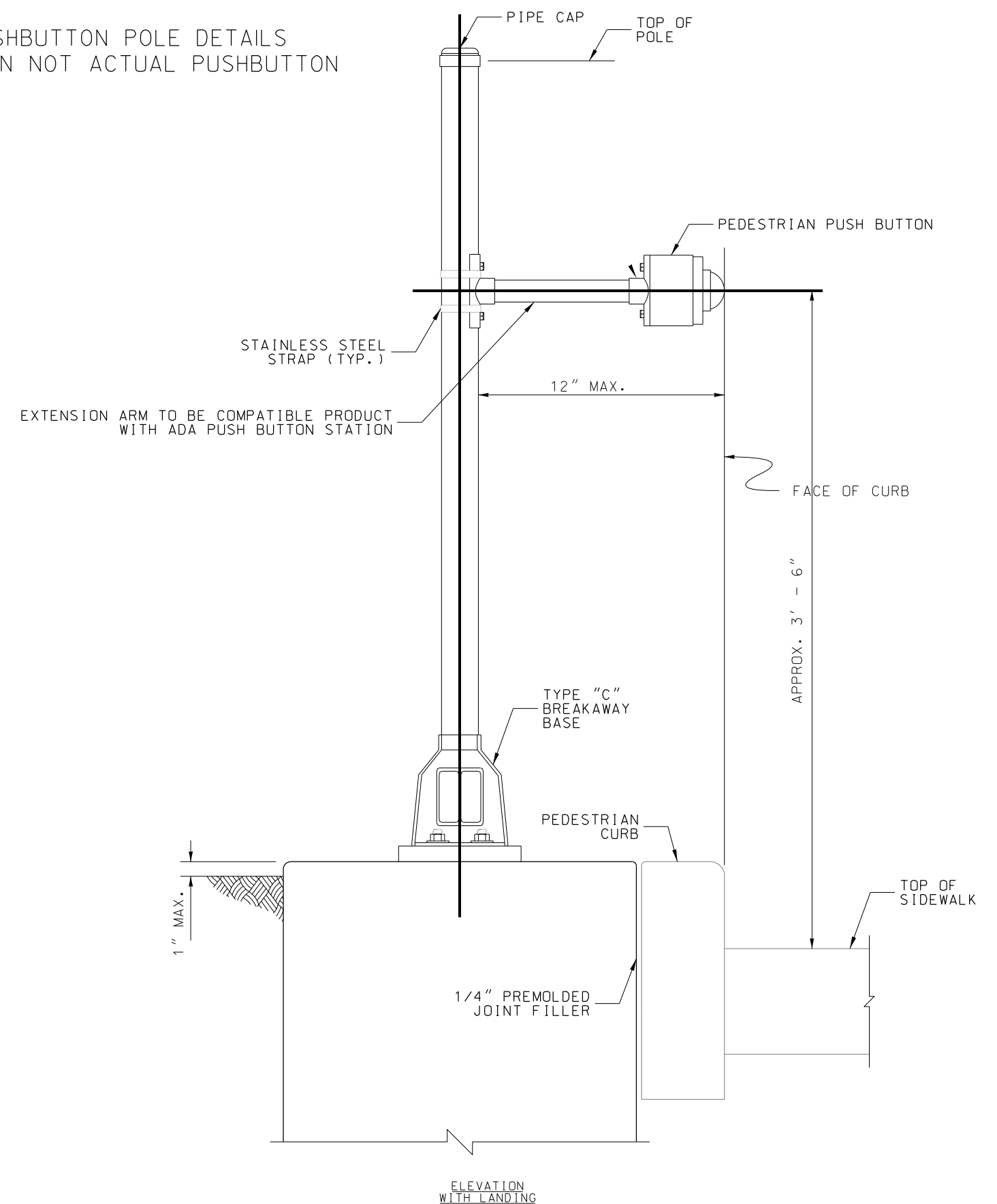
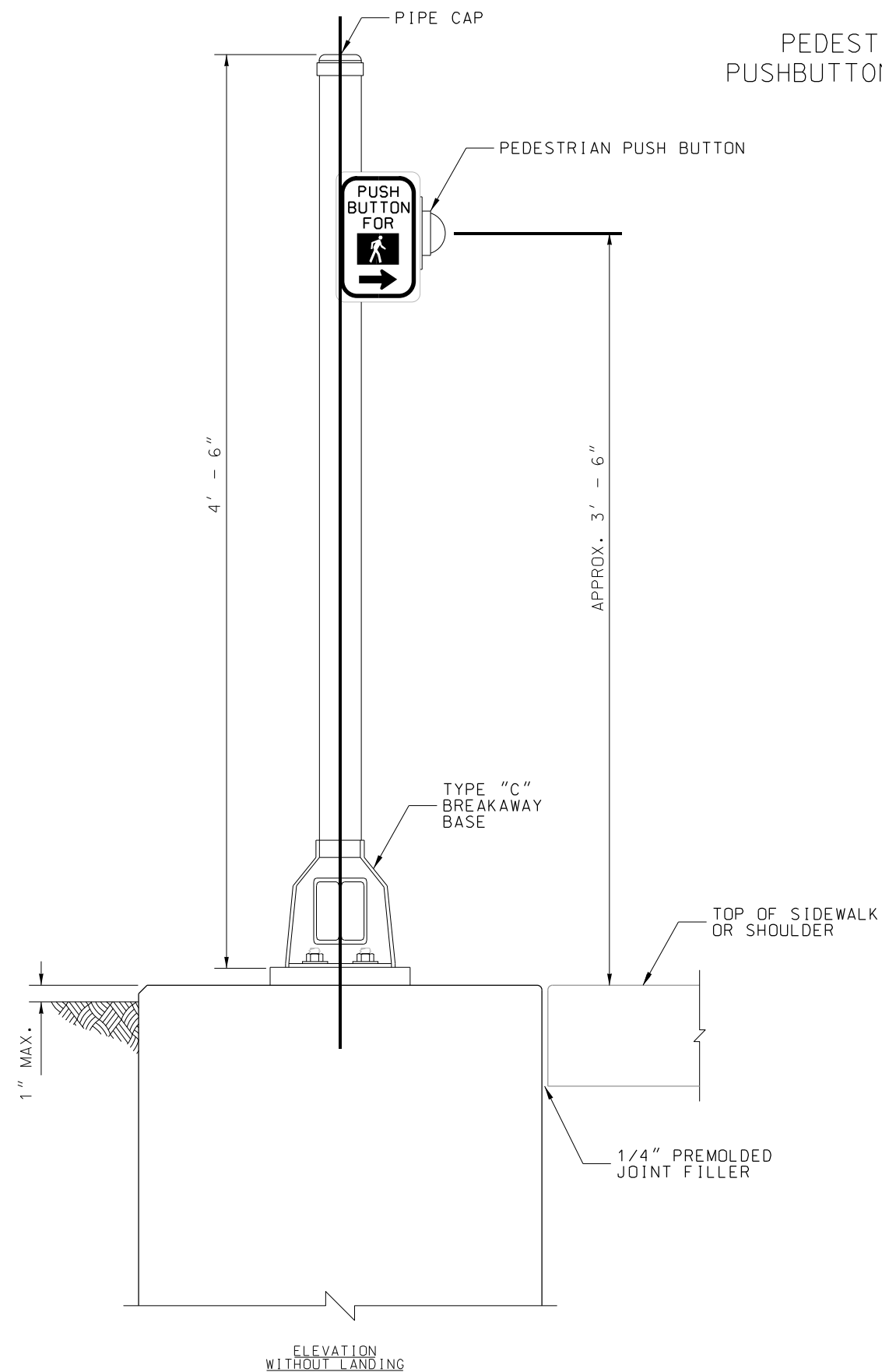
ITEM	QTY	PART NO.	DESCRIPTION
1	1	#####	PTZ CAMERA (SEE SPECIFICATIONS)
2	1	#####	CAMERA POLE MOUNT KIT
3	2	#####	PLASTIC GROMMET
4	1	#####	RG-6 COAX CABLE, 200' (IF REQ'D)
5	4	#####	COAX END CONNECTORS (IF REQ'D)
6	1	#####	SHIELDED OUTDOOR RATED 18/2 CABLE, 200' (IF REQ'D)
7	1	#####	16/2 CABLE, 250' (IF REQ'D)
8	1	#####	SHIELDED OUTDOOR-RATED CAT5 CABLE, 250'
9	4	#####	SHIELDED RJ-45 END CONNECTORS
10	2	#####	LIGHTNING ARRESTOR
11	1	#####	GREEN #12 STRANDED GROUND WIRE, 4'
12	1	#####	ENCODER (IF REQ'D)
13	1	#####	STANDARD CAT5 CABLE, 6'BLACK
14	2	#####	ASTRO BRACKET OR CLAMP KIT ASSEMBLY (IF REQ'D)
15	1	#####	16' (4" SCH 40 SPUM ALUM. MIN) RISER POLE (IF REQ'D)

NOTES

1. ALL PTZ CAMERAS SHOULD BE MOUNTED AT A 33 FT HIEGHT FROM THE PAVEMENT SURFACE.



REV	DATE	DESCRIPTION	DESIGNED BY	SMA		<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>TRAFFIC SIGNAL SIGNAL DETAILS</div> <div>SIGNAL PTZ CAMERA INSTALL DETAILS</div>		SCALE FOR 22"x34": NOT TO SCALE	
			CHECKED BY	JLH			 <div>HDR Engineering, Inc. 10450 Holmes Road Suite 600 Kansas City, MO 64131-3471 816-360-2700 Certificate of Authority: 000856</div>				FILENAME: T209.dgn	
			DRAWN BY	MMO							CONTRACT NO.:	
			CHECKED BY	JLH							CONTRACT NO. ***	
			APPROVED BY	NKS							VOLUME:	
PLOT DATE: 12/23/2022			10:07:58 AM		DATE	12-23-2022	NOT FOR CONSTRUCTION		DRAWING NO.: T209		SHEET NO.: 234	



REV	DATE	DESCRIPTION	DESIGNED BY	SMA		<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	<p>KANSAS CITY STREETCAR - RIVERFRONT EXTENSION</p> <p>TRAFFIC SIGNAL SIGNAL DETAILS PEDESTRIAN PUSHBUTTON POLE DETAILS</p>	SCALE FOR 22"x34":		
			CHECKED BY	JLH			 <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		FILENAME:		
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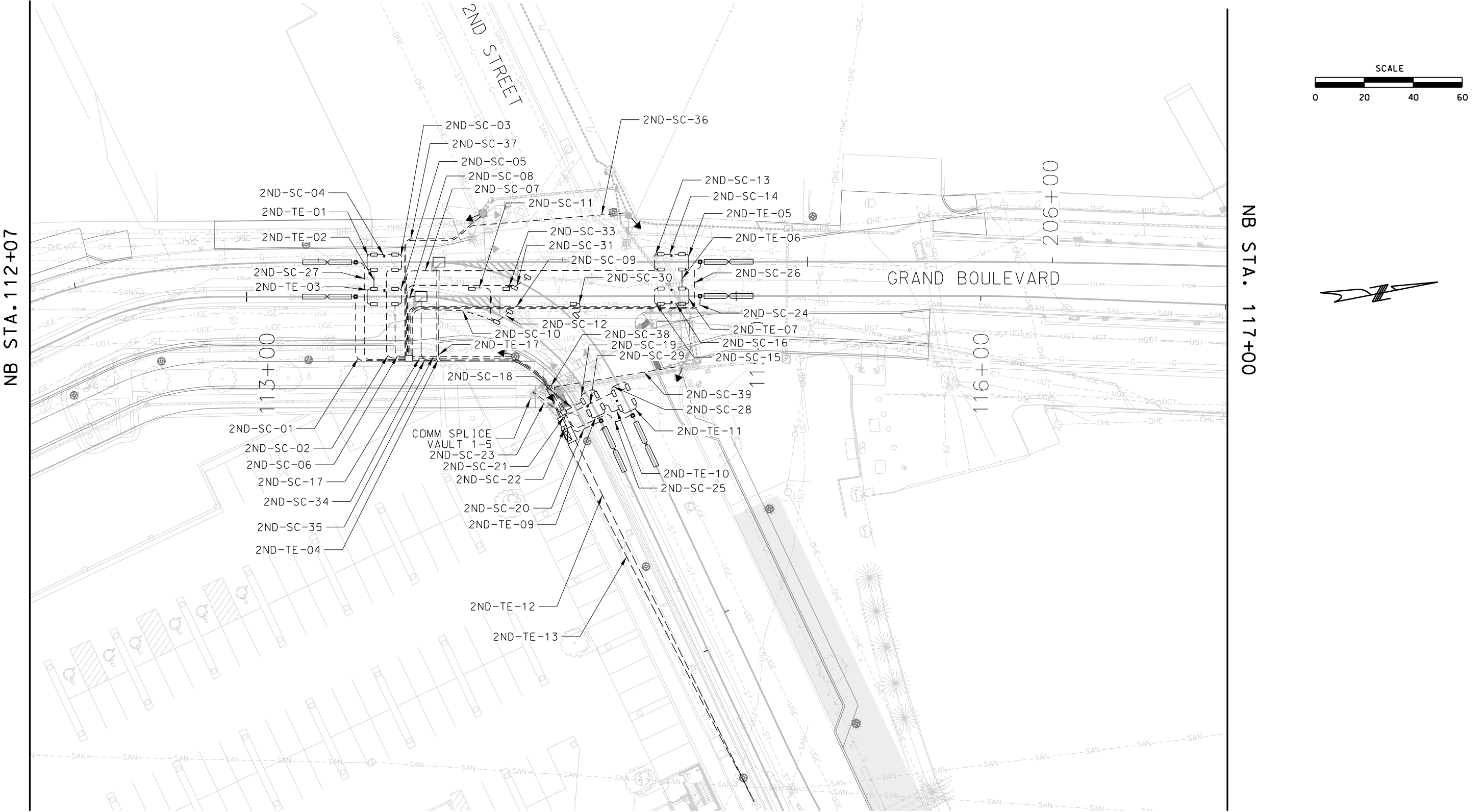
TRAFFIC SIGNAL PEDESTRIAN PUSHBUTTON POLE DETAILS


EQUIPMENT IDENTIFICATION



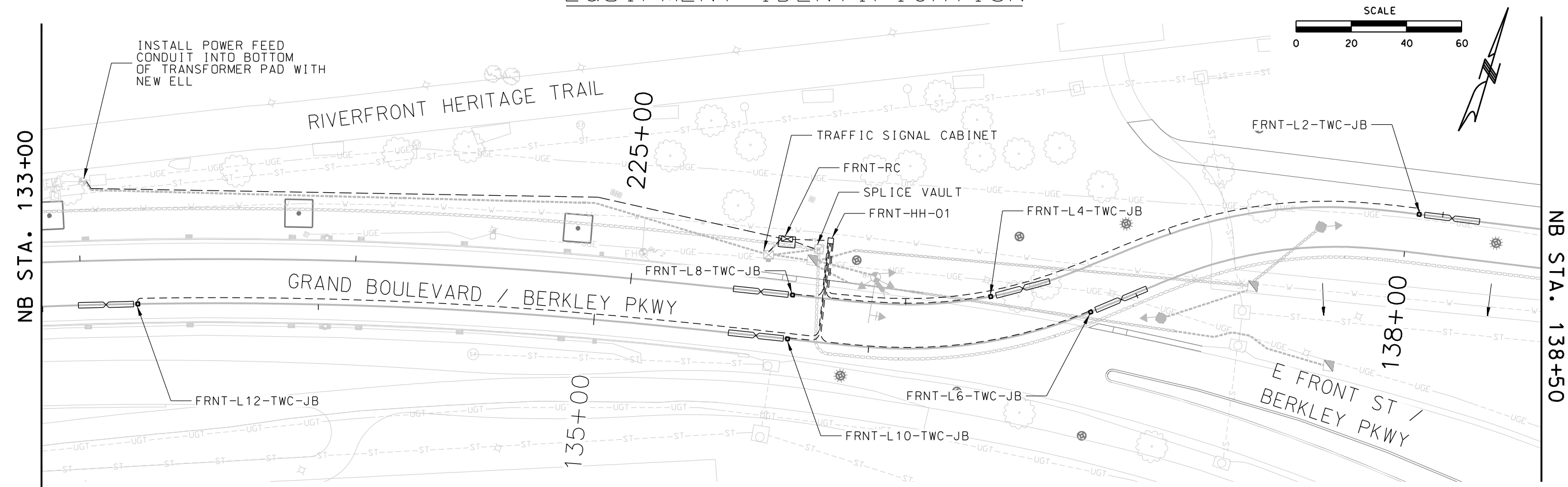
REV	DATE	DESCRIPTION	DESIGNED BY	AJW		<div>This set of plans is not for construction. These plans are intended to build interest in bidding the project.</div>	ISSUED FOR BID	DATE: 12-23-2022	<div>KANSAS CITY STREETCAR - RIVERFRONT EXTENSION</div> <div>TRAIN CONTROL PLAN 2ND & GRAND</div>	SCALE FOR 22"x34": 1" = 20'		
			CHECKED BY	JLM			 <div>HDR Engineering, Inc. 10450 Holmes Road Suite 600 Kansas City, MO 64131-3471 816-360-2700 Certificate of Authority: 000856</div>	NOT FOR CONSTRUCTION		FILENAME:		
			DRAWN BY	ZJ						CONTRACT NO.:	NO2	
			CHECKED BY	AJW						CONTRACT NO. ***		
			APPROVED BY	NKS						VOLUME:		
PLOT DATE: 12/22/2022			4:32:23 PM		DATE	12-23-2022			DRAWING NO.:	N102	SHEET NO.:	442

CONDUIT IDENTIFICATION

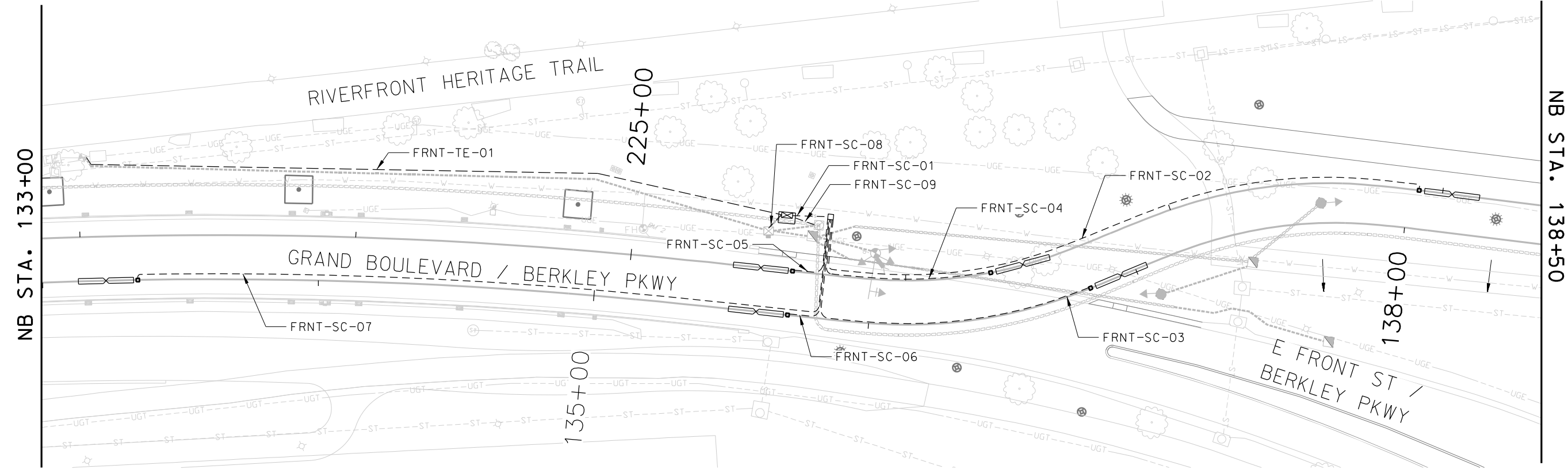


REV	DATE	DESCRIPTION	DESIGNED BY	AJW		<div>This set of plans is not for construction. These plans are intended to build interest in bidding the project.</div>	ISSUED FOR BID	DATE: 12-23-2022	<div>KANSAS CITY STREETCAR - RIVERFRONT EXTENSION</div> <div>TRAIN CONTROL PLAN 2ND & GRAND</div>	SCALE FOR 22"x34": 1" = 20'			
			CHECKED BY	JLM			 <div>HDR Engineering, Inc. 10450 Holmes Road Suite 600 Kansas City, MO 64131-3471 816-360-2700 Certificate of Authority: 000856</div>	NOT FOR CONSTRUCTION		FILENAME:			
			DRAWN BY	ZJ						N103			
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			APPROVED BY	NKS						CONTRACT NO. ***			
PLOT DATE: 12/22/2022			4:32:27 PM				DRAWING NO.:			SHEET NO.:			
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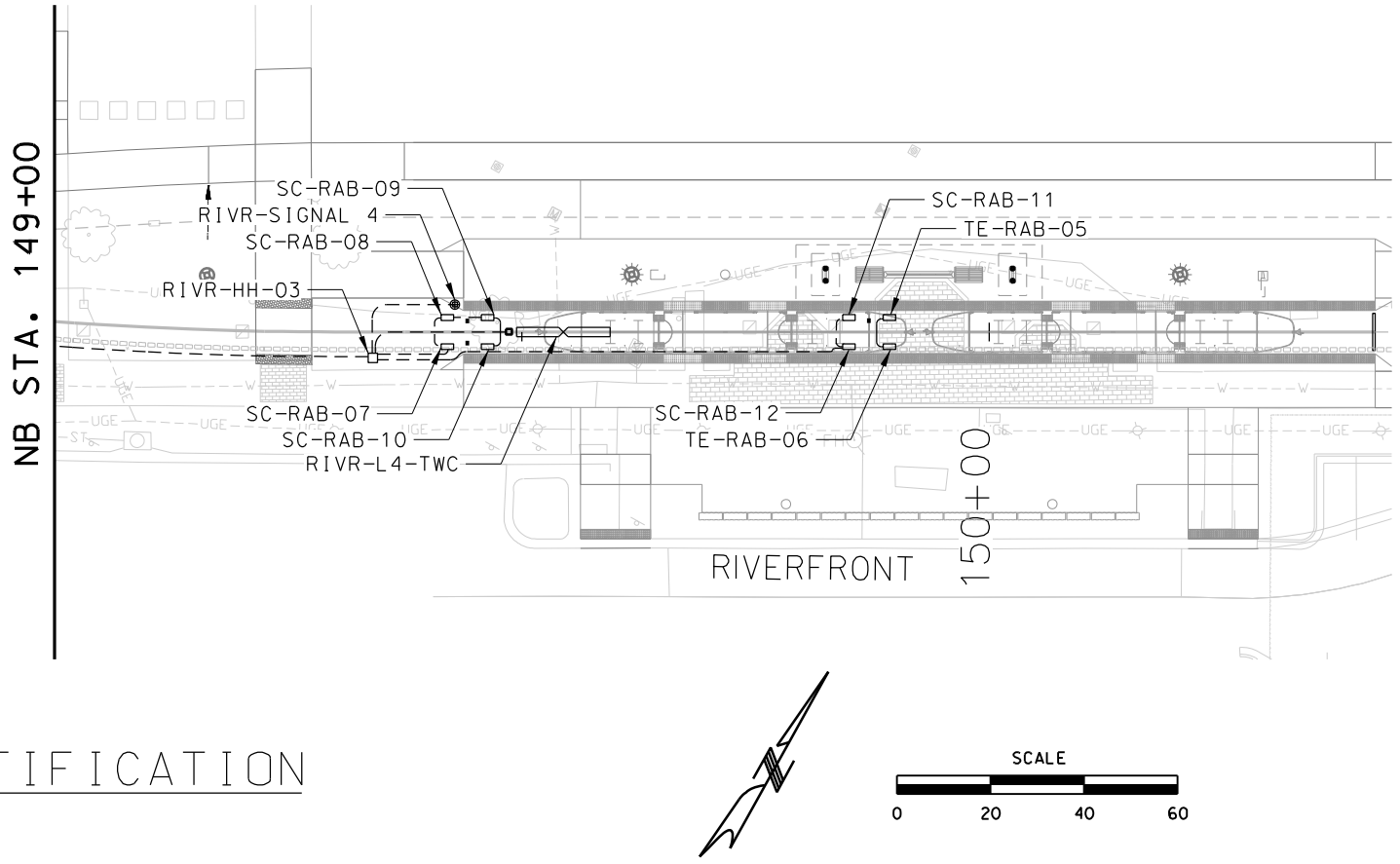
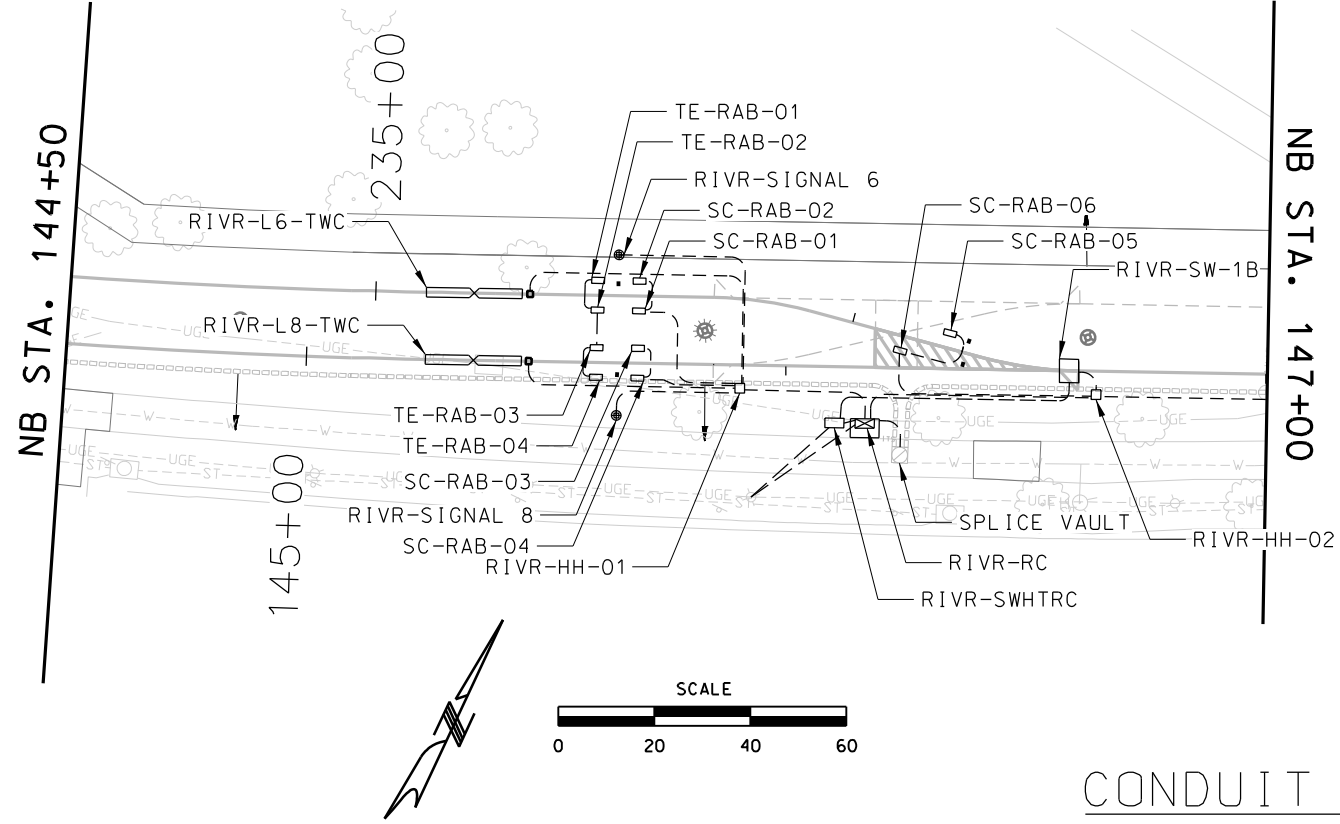


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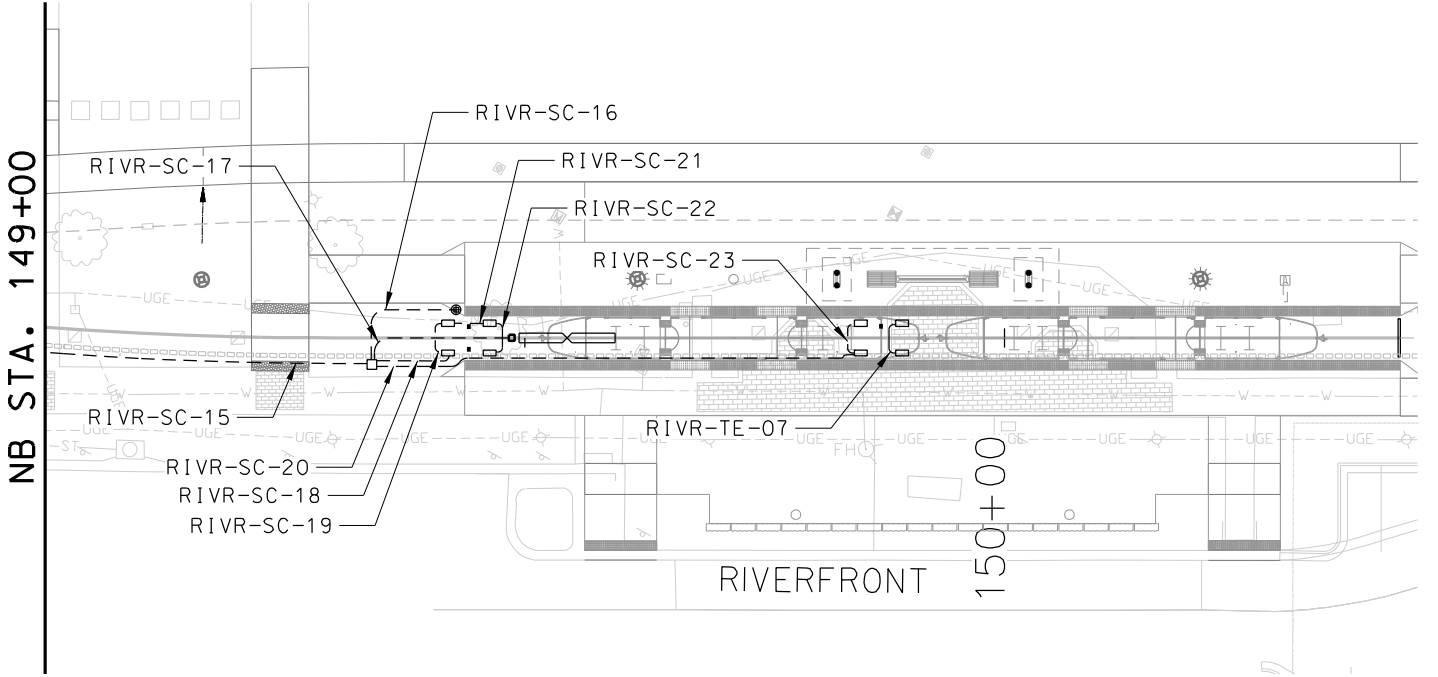
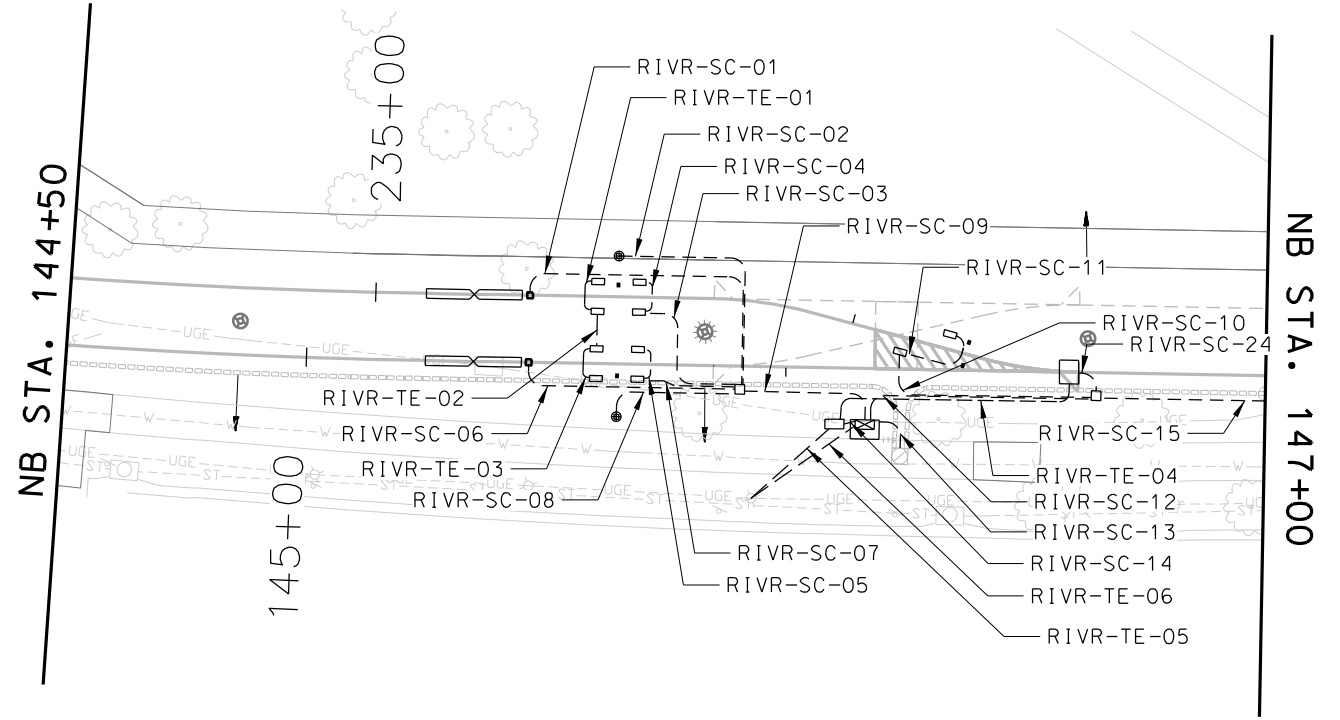


REV	DATE	DESCRIPTION	DESIGNED BY	AJW	<div><div></div><div>RideKC STREETCAR</div></div>	<div><div>This set of plans is not for construction. These plans are intended to build interest in bidding the project.</div></div>	ISSUED FOR BID		DATE: 12-23-2022	KANSAS CITY STREETCAR - RIVERFRONT EXTENSION		SCALE FOR 22"x34": 1" = 20'	
			CHECKED BY	JLM			HDR			TRAIN CONTROL PLAN		FILENAME:	
			DRAWN BY	ZJ			10450 Holmes Road			FRONT & BERKLEY		N104	
			CHECKED BY	AJW			Suite 800					CONTRACT NO.:	
			APPROVED BY	NKS			Kansas City, MO 64131-3471					CONTRACT NO. ***	
PLOT DATE: 12/22/2022			DATE		12-23-2022	NOT FOR CONSTRUCTION						VOLUME:	
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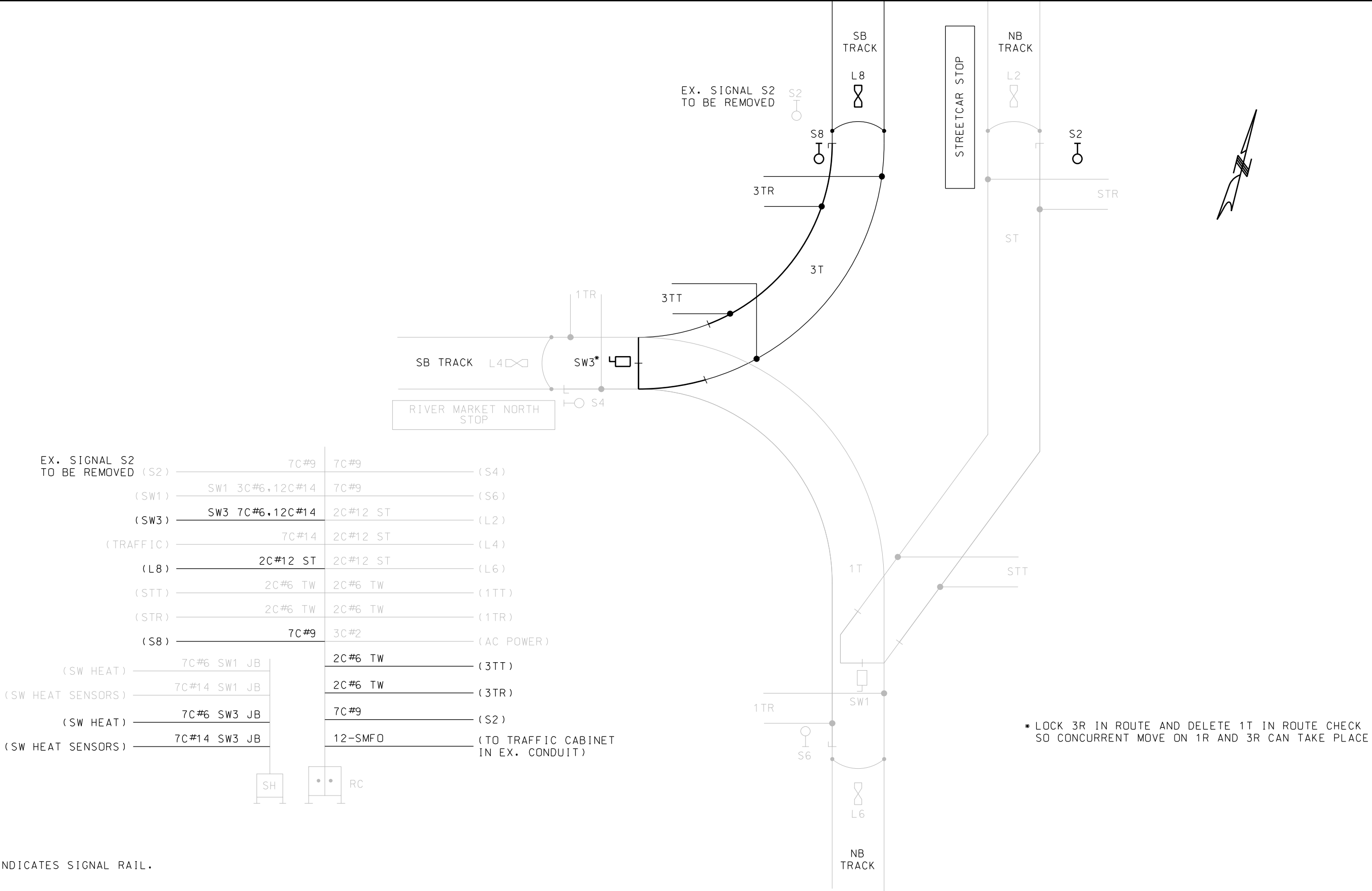
EQUIPMENT IDENTIFICATION



CONDUIT IDENTIFICATION



REV	DATE	DESCRIPTION	DESIGNED BY	AJW		<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>TRAIN CONTROL PLAN RIVERFRONT</div>		SCALE FOR 22"x34": 1" = 20'		
			CHECKED BY	JLM			 <div>HDR Engineering, Inc. 10450 Holmes Road Suite 600 Kansas City, MO 64131-3471 816-360-2700 Certificate of Authority: 000856</div>	NOT FOR CONSTRUCTION		FILENAME:					
			DRAWN BY	ZJ						N105					
			CHECKED BY	AJW						CONTRACT NO.:					
			APPROVED BY	NKS						CONTRACT NO. ***					
PLOT DATE: 12/22/2022			4:32:36 PM				DATE: 12-23-2022			DRAWING NO.:			SHEET NO.:		
										N105			445		



EX. SIGNAL S2 TO BE REMOVED (S2)	7C#9	7C#9	(S4)
(SW1)	SW1 3C#6, 12C#14	7C#9	(S6)
(SW3)	SW3 7C#6, 12C#14	2C#12 ST	(L2)
(TRAFFIC)	7C#14	2C#12 ST	(L4)
(L8)	2C#12 ST	2C#12 ST	(L6)
(STT)	2C#6 TW	2C#6 TW	(1TT)
(STR)	2C#6 TW	2C#6 TW	(1TR)
(S8)	7C#9	3C#2	(AC POWER)
(SW HEAT)	7C#6 SW1 JB	2C#6 TW	(3TT)
(SW HEAT SENSORS)	7C#14 SW1 JB	2C#6 TW	(3TR)
(SW HEAT)	7C#6 SW3 JB	7C#9	(S2)
(SW HEAT SENSORS)	7C#14 SW3 JB	12-SMFO	(TO TRAFFIC CABINET IN EX. CONDUIT)

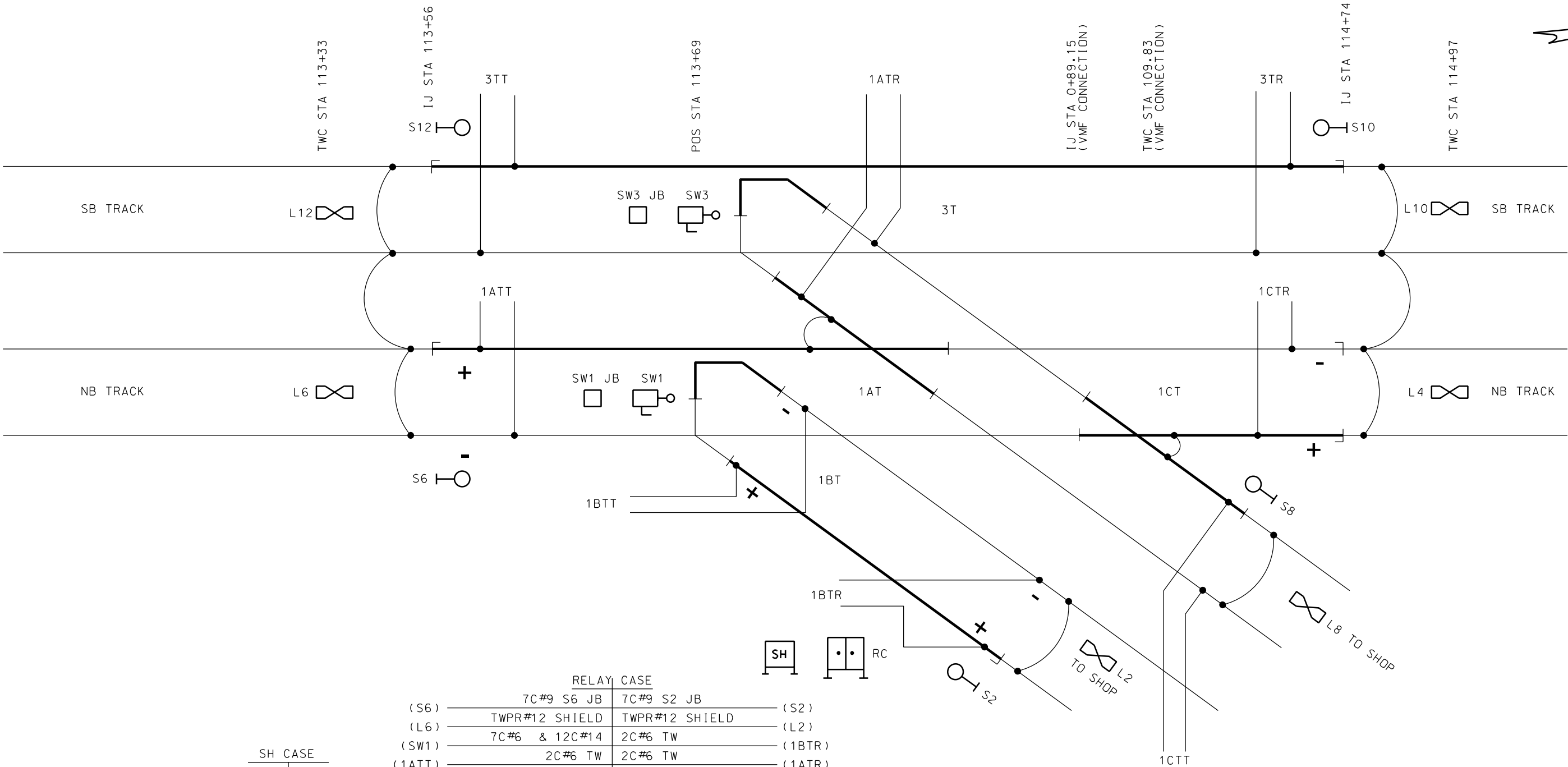
SH

RC

* LOCK 3R IN ROUTE AND DELETE 1T IN ROUTE CHECK
SO CONCURRENT MOVE ON 1R AND 3R CAN TAKE PLACE

NOTES:
1. ——— INDICATES SIGNAL RAIL.

REV	DATE	DESCRIPTION	DESIGNED BY AJW		<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>TRAIN CONTROL</div> <div>TRACK AND CABLE PLAN - 3RD & GRAND</div>	SCALE FOR 22"x34": NOT TO SCALE	
			CHECKED BY JLM			 <div>HDR Engineering, Inc. 10450 Holmes Road Suite 600 Kansas City, MO 64131-3471 816-360-2700 Certificate of Authority: 000856</div>	FILENAME: N600			
			DRAWN BY ZJ				CONTRACT NO.: CONTRACT NO. ***			
			CHECKED BY AJW				VOLUME: 1			
			APPROVED BY NKS				DRAWING NO.: N600		SHEET NO.: 446	
PLOT DATE: 12/22/2022			4:32:40 PM	DATE	12-23-2022	NOT FOR CONSTRUCTION				



SH CASE	
(SW HEAT)	5-1C#6 2KV SW3 JB
(SW HEAT)	5-1C#6 2KV SW1 JB
(AC POWER)	3C#2 W/ GROUND


RELAY CASE	
(S6)	7C#9 S6 JB
(L6)	TWPR#12 SHIELD
(SW1)	7C#6 & 12C#14
(1ATT)	2C#6 TW
(1BTT)	2C#6 TW
(S12)	7C#9 S12 JB
(SW3)	7C#6 & 12C#14
(L12)	TWPR#12 SHIELD
(3ATT)	2C#6 TW
(S2)	7C#9 S2 JB
(L2)	TWPR#12 SHIELD
(1BTR)	2C#6 TW
(1ATR)	2C#6 TW
(TRAFFIC)	7C#14
(TO SPLICE VAULT SEE COMM. PLANS)	12-SMFO
(AC POWER)	3C#2 W/ GROUND
(S8)	7C#9 S8 JB
(S10)	7C#9 S10 JB
(L4)	TWPR#12 SHIELD
(L8)	TWPR#12 SHIELD
(L10)	TWPR#12 SHIELD
(3ATR)	2C#6 TW
(1CTT)	2C#6 TW
(1CTR)	2C#6 TW

REV	DATE	DESCRIPTION
PLOT DATE: 12/22/2022		4:32:42 PM

DESIGNED BY	AJW
CHECKED BY	JLM
DRAWN BY	ZJ
CHECKED BY	AJW
APPROVED BY	NKS
DATE	12-23-2022



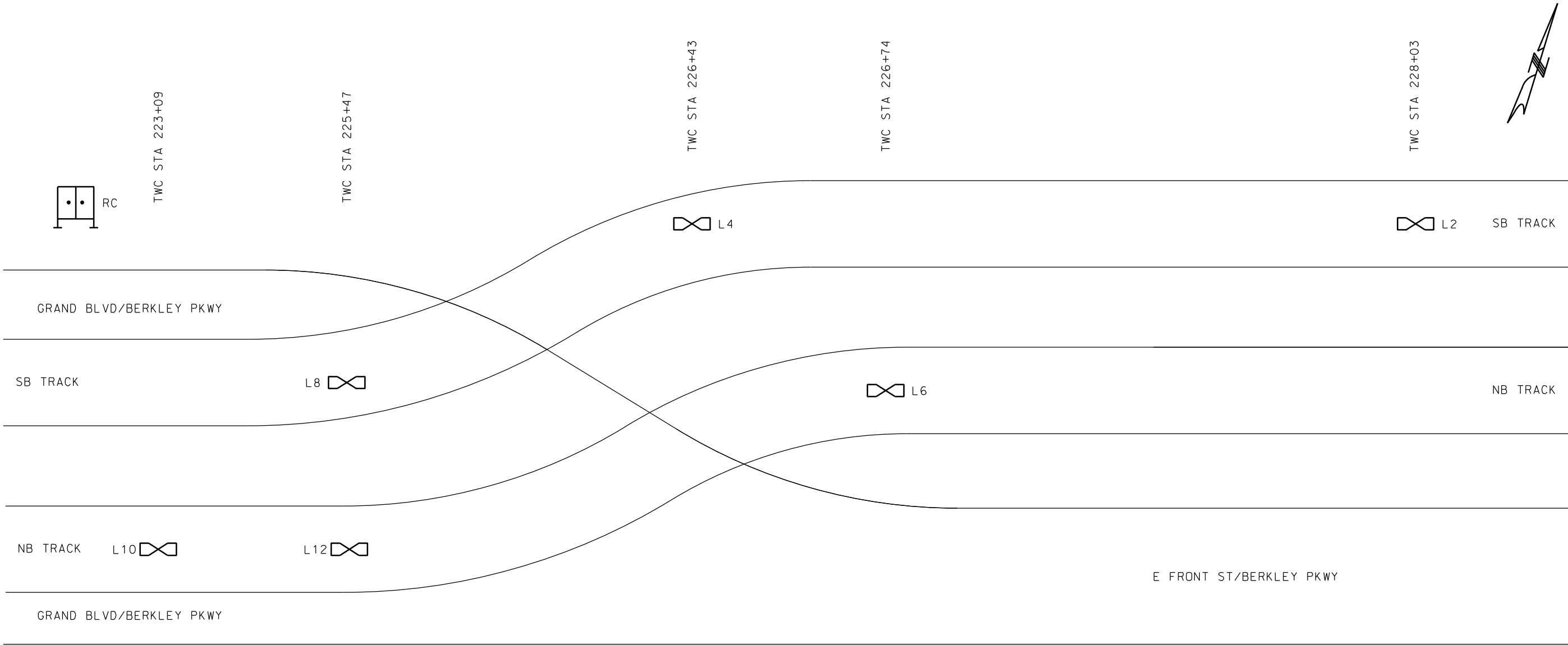
This set of plans is not for construction. These plans are intended to build interest in bidding the project.

ISSUED FOR BID	DATE: 12-23-2022
 HDR Engineering, Inc. 10450 Holmes Road Suite 600 Kansas City, MO 64131-3471 816-360-2700 Certificate of Authority: 000856	
NOT FOR CONSTRUCTION	

KANSAS CITY STREETCAR - RIVERFRONT EXTENSION

TRAIN CONTROL
TRACK AND CABLE PLAN - 2ND & GRAND

SCALE FOR 22"x34": NOT TO SCALE	
FILENAME: N601	
CONTRACT NO.: CONTRACT NO. ***	
VOLUME: 1	
DRAWING NO.:	SHEET NO.:
N601	447





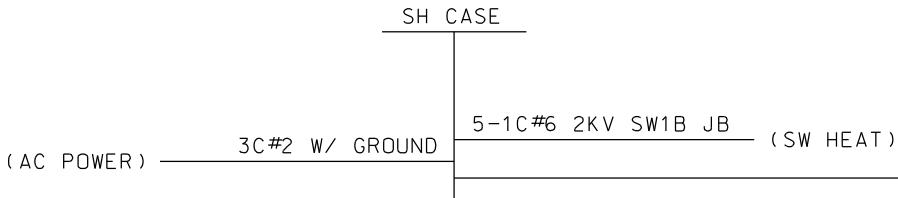
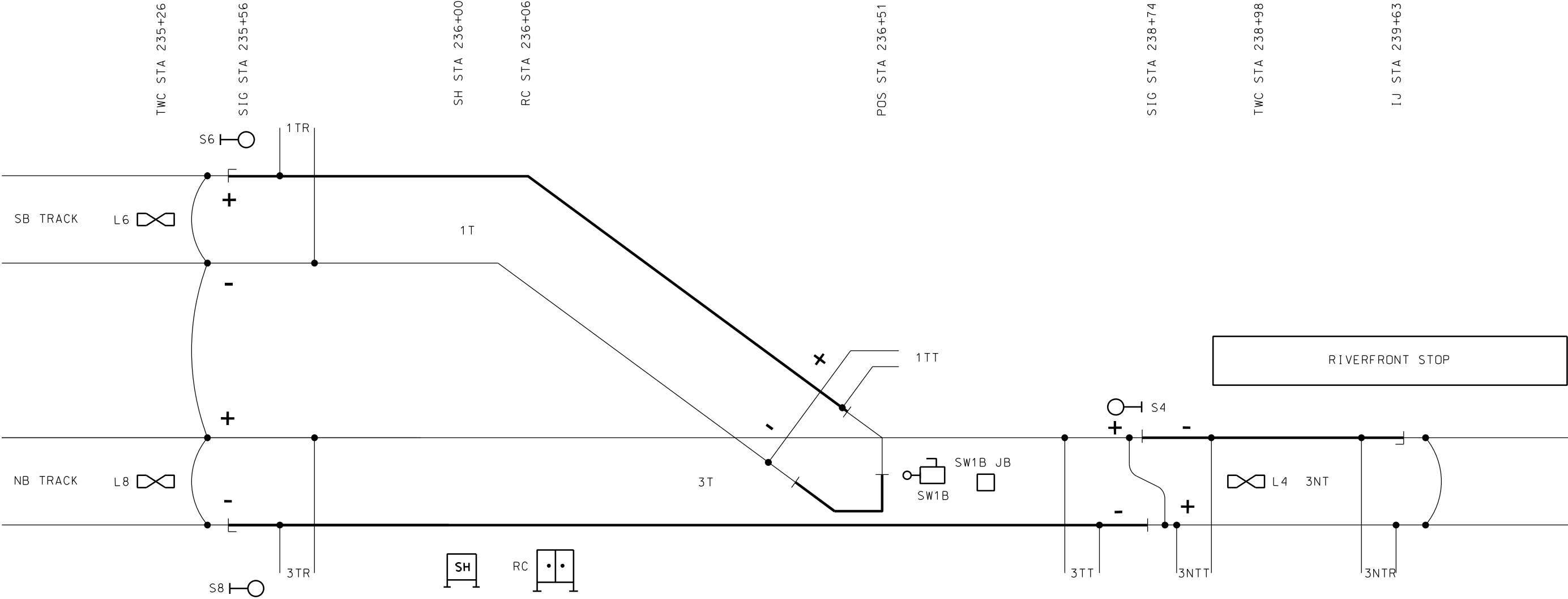
RELAY CASE

(L8)	TWPR#12 SHIELD	TWPR#12 SHIELD	(L2)
(L10)	TWPR#12 SHIELD	TWPR#12 SHIELD	(L4)
(L12)	TWPR#12 SHIELD	TWPR#12 SHIELD	(L6)
		7C#14	(TRAFFIC)
		12-SMFO	(TO SPLICE VAULT SEE COMM. PLANS)
		3C#2 W/ GROUND	(AC POWER)

NOTES:

1.  INDICATES SIGNAL RAIL.

REV	DATE	DESCRIPTION	DESIGNED BY AJW		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	KANSAS CITY STREETCAR - RIVERFRONT EXTENSION	SCALE FOR 22"x34": NOT TO SCALE FILENAME: N602 CONTRACT NO.: CONTRACT NO. *** VOLUME: I	TRAIN CONTROL TRACK AND CABLE PLAN - FRONT STREET	DRAWING NO.: N602	SHEET NO.: 448					
			CHECKED BY JLM			 HDR Engineering, Inc. 10450 Holmes Road Suite 600 Kansas City, MO 64131-3471 816-360-2700 Certificate of Authority: 000856	NOT FOR CONSTRUCTION										
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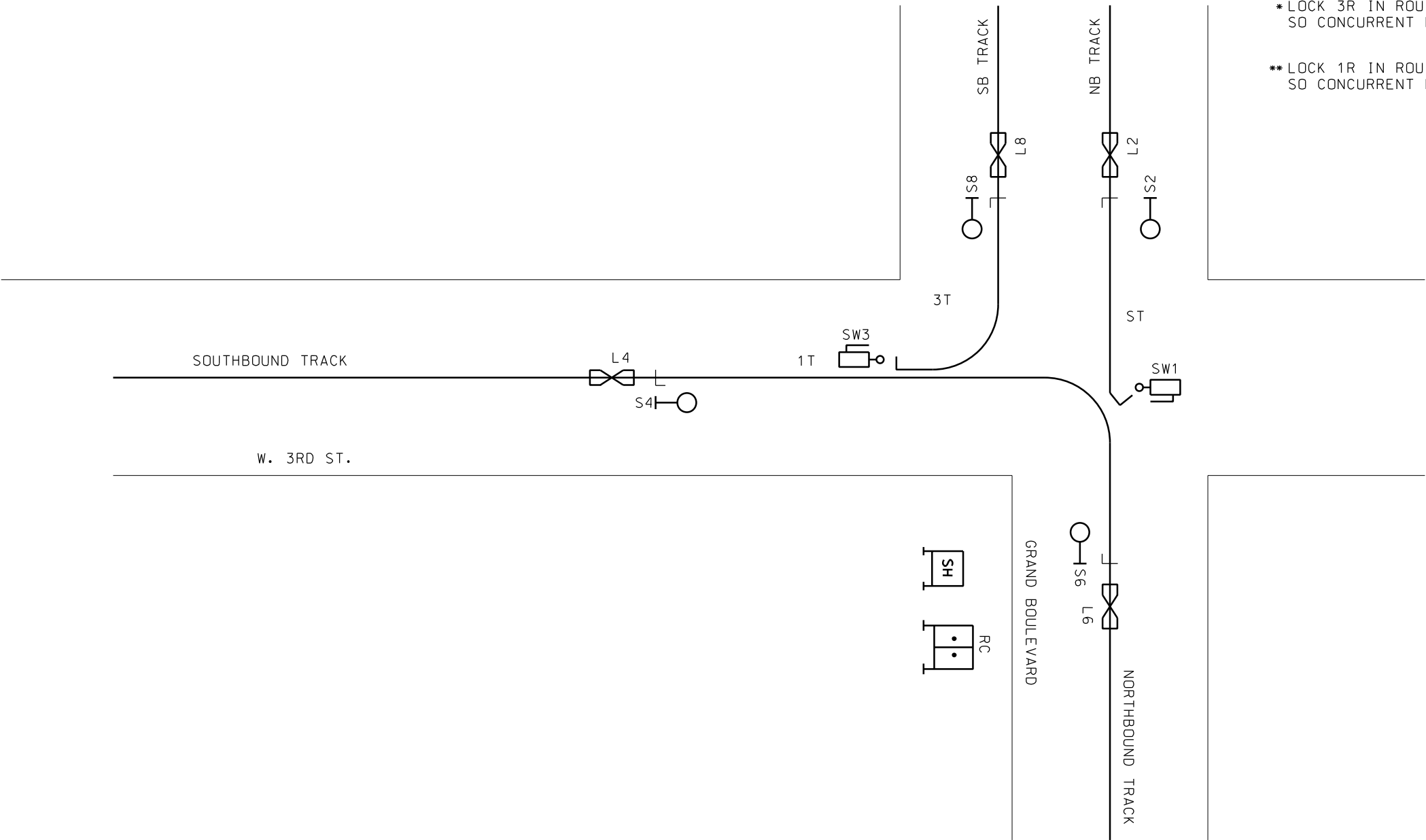


RELAY CASE			
(S6)	7C#9 S6 JB	7C#9 S4 JB	(S4)
(S8)	7C#9 S8 JB	TWPR#12 SHIELD	(L4)
(L6)	TWPR#12 SHIELD	2C#6 TW	(1TT)
(L8)	TWPR#12 SHIELD	2C#6 TW	(3TT)
(1TR)	2C#6 TW	2C#6 TW	(3NTT)
(3TR)	2C#6 TW	2C#6 TW	(3NTR)
		7C#6 & 12C#14	(SW1B)
		12-SMFO	(TO SPLICE VAULT SEE COMM. PLANS)
		3C#2 W/ GROUND	(AC POWER)

NOTES:
1. ——— INDICATES SIGNAL RAIL.


REV	DATE	DESCRIPTION	DESIGNED BY AJW		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	KANSAS CITY STREETCAR - RIVERFRONT EXTENSION	SCALE FOR 22"x34": NOT TO SCALE FILENAME: N603 CONTRACT NO.: CONTRACT NO. *** VOLUME: DRAWING NO.: SHEET NO.: N603 449	
			CHECKED BY JLM				HDR Engineering, Inc.			TRAIN CONTROL TRACK AND CABLE PLAN - RIVERFRONT
			DRAWN BY ZJ			10450 Holmes Road Suite 600 Kansas City, MO 64131-3471 816-360-2700 Certificate of Authority: 000856				
			CHECKED BY AJW							
			APPROVED BY NKS							
PLOT DATE: 12/22/2022			4:32:48 PM	DATE	12-23-2022	NOT FOR CONSTRUCTION				

ROUTE	REQUESTS SIGNAL	FLEETED	PREVENTS	APPROACH TRACK	DETECTOR TRACK	SIGNAL ASPECT	APPROACH RELEASE	LOCKING	SWITCH LOCKED	SECTIONAL RELEASE	TWC REQUEST	LCP REQUEST
S2-S6	S2	NO	S4, S6	N/A	1T, ST	LUNAR VERTICAL	N/A	TIME	1R, 3N*	YES	YES	YES
S4-S6	S4	NO	S2, S6, S8	N/A	1T	LUNAR DIAGONAL	N/A	TIME	1N, 3N	YES	YES	YES
S6-S2	S6	YES	S2, S4	N/A	1T, ST	LUNAR VERTICAL	N/A	TIME	1R, 3N*	YES	YES	YES
S6-S4	S6	NO	S2, S4, S8	N/A	1T	LUNAR DIAGONAL	N/A	TIME	1N, 3N	YES	YES	YES
S4-S8	S4	NO	S6, S8	N/A	1T, 3T	LUNAR VERTICAL	N/A	TIME	1N,**3R	YES	YES	YES
S8-S4	S8	YES	S4, S6	N/A	1T, 3T	LUNAR VERTICAL	N/A	TIME	1N,**3R	YES	YES	YES

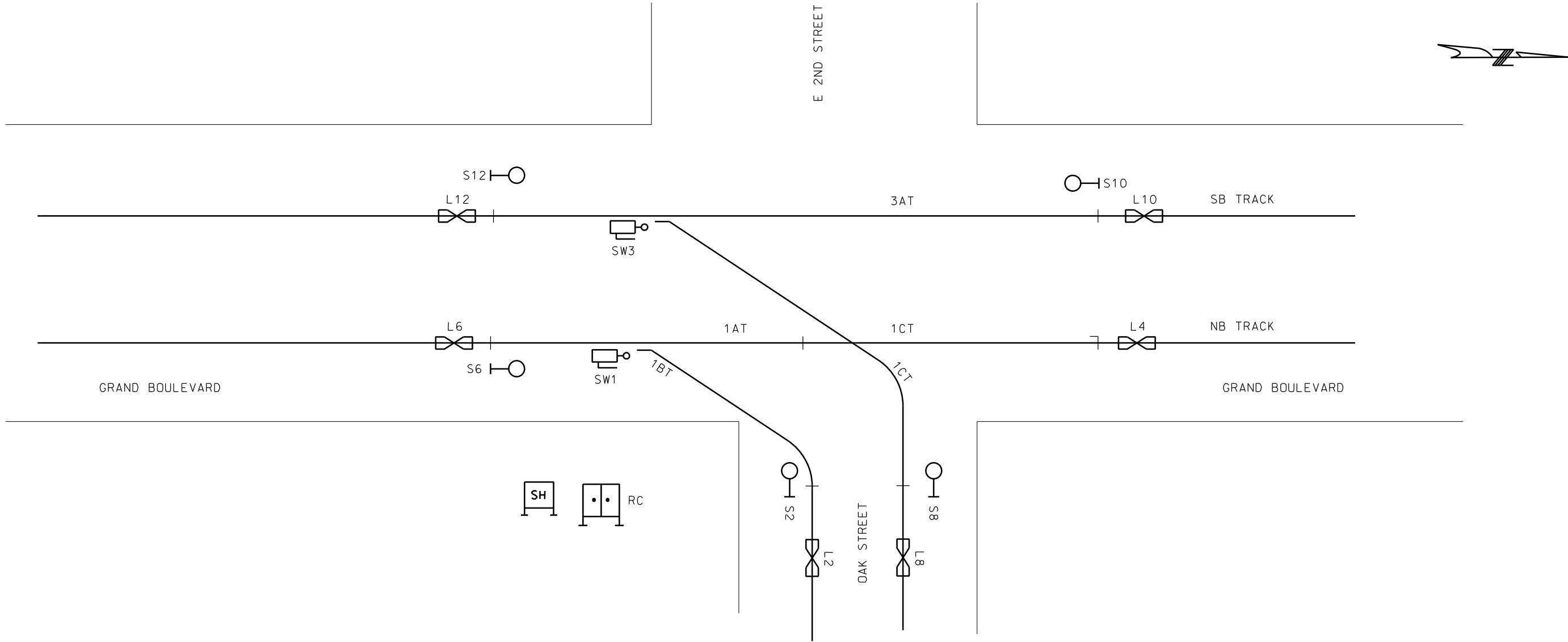


* LOCK 3R IN ROUTE AND DELETE 1T IN ROUTE CHECK
SO CONCURRENT MOVE ON 1R AND 3R CAN TAKE PLACE

** LOCK 1R IN ROUTE AND DELETE 1T IN ROUTE CHECK
SO CONCURRENT MOVE ON 1R AND 3R CAN TAKE PLACE

REV	DATE	DESCRIPTION	DESIGNED BY	AJW		<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>TRAIN CONTROL</div> <div>ROUTE AND ASPECT CHART - 3RD & GRAND</div>	SCALE FOR 22"x34": NOT TO SCALE	
			CHECKED BY	JLM			 <div>HDR Engineering, Inc. 10450 Holmes Road Suite 600 Kansas City, MO 64131-3471 816-360-2700 Certificate of Authority: 000856</div>	NOT FOR CONSTRUCTION		FILENAME:	
			DRAWN BY	ZJ						N604	
			CHECKED BY	AJW						CONTRACT NO.:	
			APPROVED BY	NKS						CONTRACT NO. ***	
PLOT DATE: 12/22/2022			4:32:50 PM		DATE	12-23-2022			DRAWING NO.:	SHEET NO.:	
									N604	450	

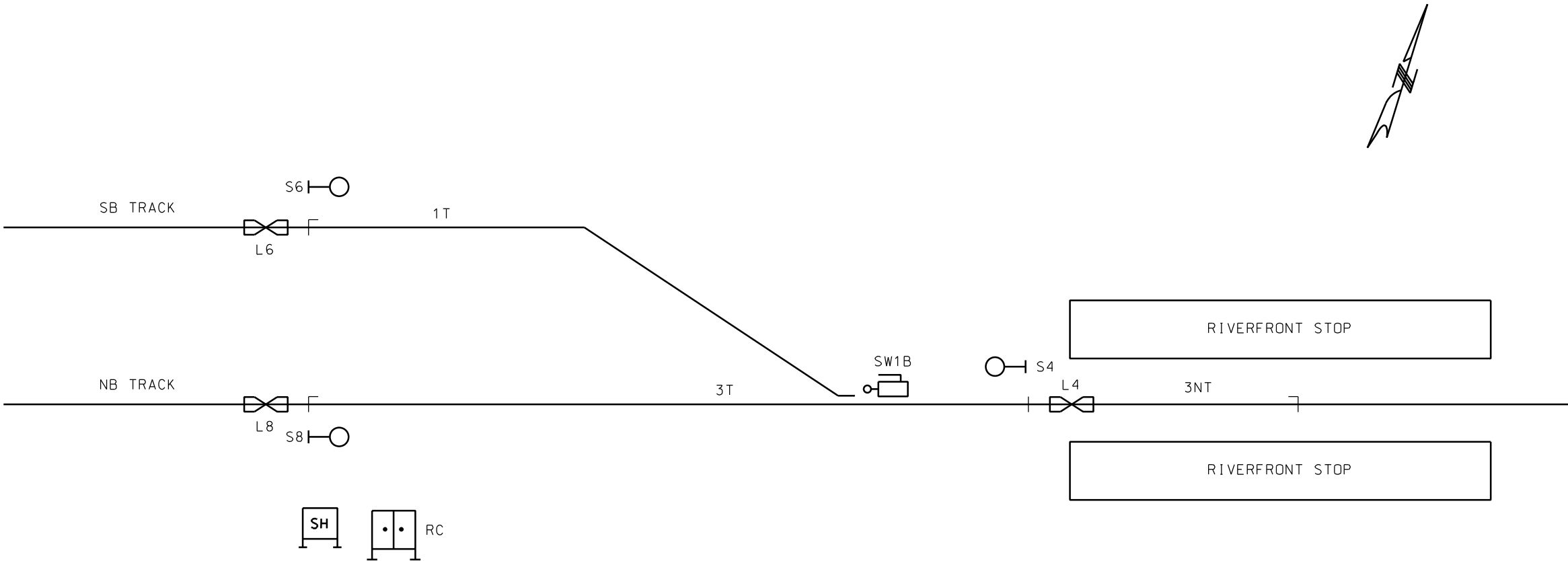
ROUTE	REQUESTS SIGNAL	FLEETED	PREVENTS	APPROACH TRACK	DETECTOR TRACK	SIGNAL ASPECT	APPROACH RELEASE	LOCKING	SWITCH LOCKED	SECTIONAL RELEASE	TWC REQUEST	LCP REQUEST
S10-S12	S10	YES	S12, S8	N/A	3T	LUNAR VERTICAL	N/A	TIME	3N	YES	YES	YES
S12-S10	S12	NO	S10, S8	N/A	3T	LUNAR VERTICAL	N/A	TIME	3N	YES	YES	YES
S12-S8	S12	NO	S10, S8, S6	N/A	3T, 1AT, 1CT	LUNAR DIAGONAL	N/A	TIME	3R - 1R	YES	YES	YES
S6	S6	YES	S2, S8	N/A	1AT, 1BT, 1CT	LUNAR VERTICAL	N/A	TIME	1N - 3N	YES	YES	YES
S6-S2	S6	NO	S2, S8	N/A	1AT, 1BT	LUNAR DIAGONAL	N/A	TIME	1R	YES	YES	YES
S2-S6	S2	NO	S6	N/A	1AT, 1BT	LUNAR VERTICAL	N/A	TIME	1R	YES	YES	YES
S8-S12	S8	NO	S10, S12, S6	N/A	1AT, 1CT, 3T	LUNAR VERTICAL	N/A	TIME	3R - 1R	YES	YES	YES



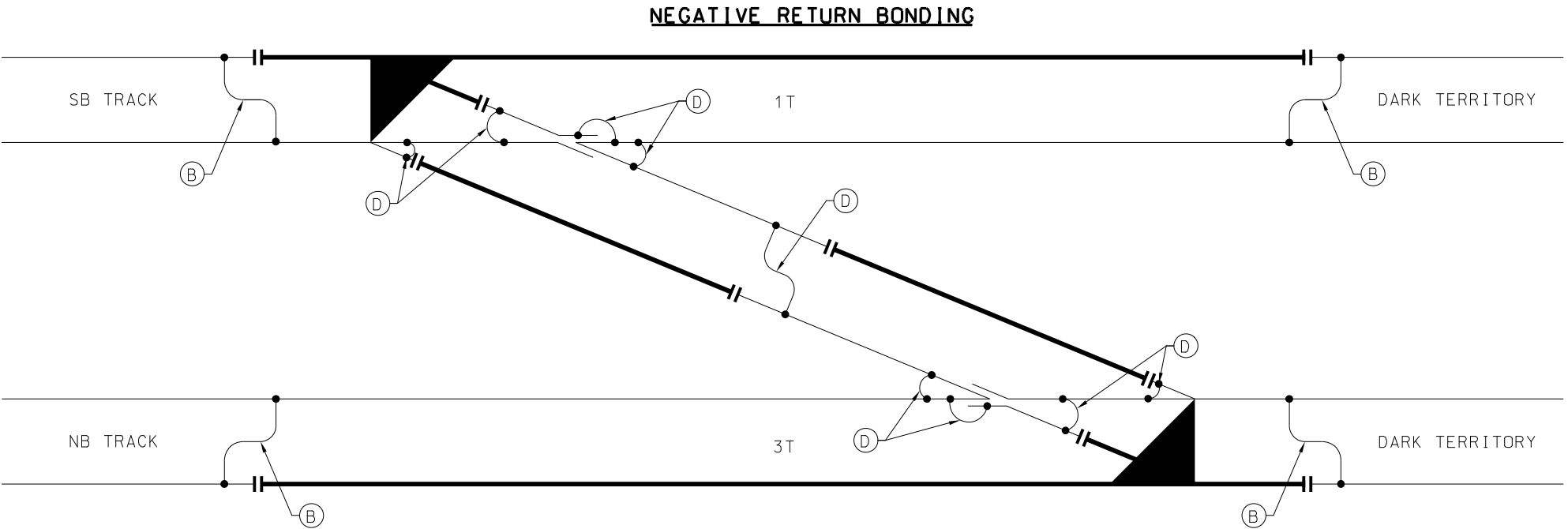
REV	DATE	DESCRIPTION	DESIGNED BY AJW		<p>This set of plans is not for construction. These plans are intended to build interest in bidding the project.</p>	ISSUED FOR BID	DATE: 12-23-2022	KANSAS CITY STREETCAR - RIVERFRONT EXTENSION	SCALE FOR 22"x34": NOT TO SCALE FILENAME: N605 CONTRACT NO.: CONTRACT NO. *** VOLUME: DRAWING NO.: SHEET NO.: N605 451
			CHECKED BY JLM			 HDR Engineering, Inc. 10450 Holmes Road Suite 600 Kansas City, MO 64131-3471 816-360-2700 Certificate of Authority: 000856	NOT FOR CONSTRUCTION		
			DRAWN BY ZJ						
			CHECKED BY AJW						
			APPROVED BY NKS						
PLOT DATE: 12/22/2022 4:32:53 PM			DATE 12-23-2022						

ROUTE	REQUESTS SIGNAL	FLEETED	PREVENTS	APPROACH TRACK	DETECTOR TRACK	SIGNAL ASPECT	APPROACH RELEASE	LOCKING	SWITCH LOCKED	SECTIONAL RELEASE	TWC REQUEST	LCP REQUEST
S4-S8	S4	NO	S6, S8	3NT	3T	LUNAR VERTICAL	N/A	TIME	1B	YES	YES	YES
S4-S6	S4	YES	S6, S8	3NT	3T, 1T	LUNAR DIAGONAL	N/A	TIME	1B	YES	YES	YES
S6-S4	S6	NO	S4, S8	N/A	1T, 3T	LUNAR DIAGONAL	N/A	TIME	1B	YES	YES	YES
S8-S4	S8	YES	S4, S6	N/A	3T	LUNAR VERTICAL	N/A	TIME	1B	YES	YES	YES

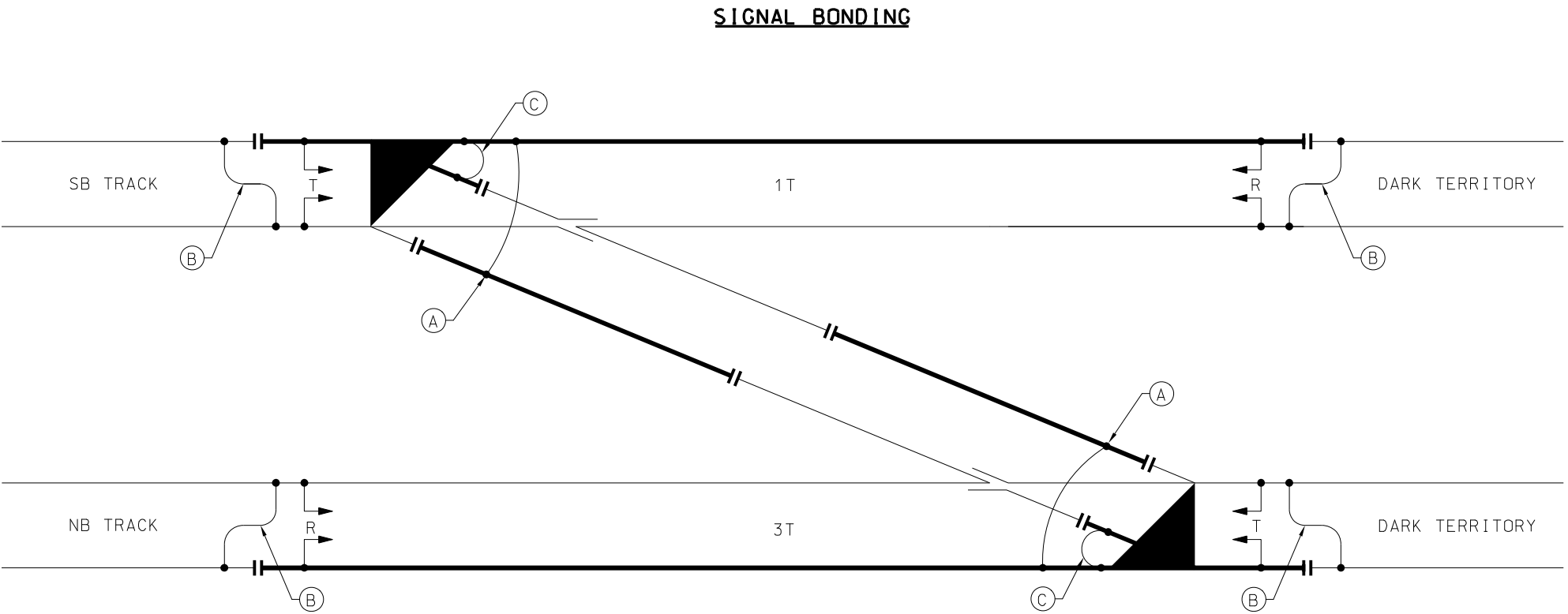
NOTE: PROPOSED AUTO ROUTING WILL BE FOR NORTHBOUND MOVES. S8 SIGNAL FLEETS TO UNOCCUPIED 3NT WITH 1T/3T UNOCCUPIED. ONCE A TRAIN HAS OCCUPIED 3NT THE ROUTE WILL BE REQUESTED TO EXIT THE SB TRACK AND WHEN TURNOUT IS IN REVERSE POSITION.





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			CHECKED BY	JLM			 <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				NOT TO SCALE		FILENAME:	
			DRAWN BY	ZJ							N606		CONTRACT NO.:			
			CHECKED BY	AJW							CONTRACT NO. ***		VOLUME:			
			APPROVED BY	NKS							I		DRAWING NO.:			
PLOT DATE: 12/22/2022		4:32:56 PM		DATE 12-23-2022									DRAWING NO.:		SHEET NO.:	
													N606		452	

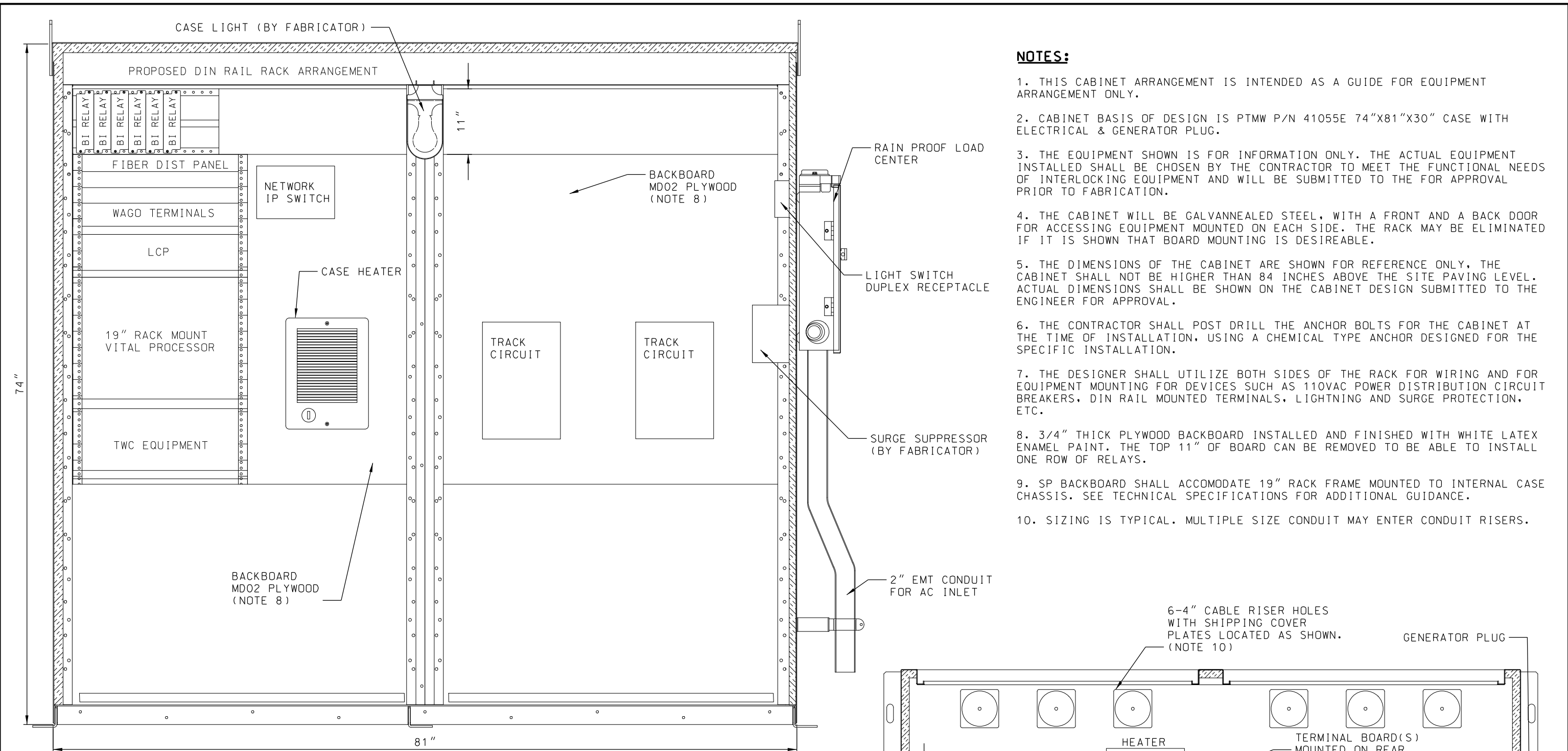


- NOTES:**
- 1. JUMPERS NOT REQUIRED IF CONTINUOUS CAST BED PLATE IS USED.
 - 2. SEAL OPENINGS AROUND CONDUITS AND DRAIN PIPES WITH ELASTOMERIC GROUT AT INSULATION LINER.
 - 3. SEE TRACK DRAWINGS FOR ADDITIONAL BATHTUB AND TRACK CONSTRUCTION DETAILS.
 - 4. THE CONTRACTOR SHALL PROVIDE BONDING PLANS FOR EACH SWITCH POINT LOCATION FOR APPROVAL.
 - 5. ARRANGEMENT SHOWN IS GENERAL AND IS PROVIDED TO SHOW TYPICAL ARRANGMENTS OF TRACK CIRCUITS, BONDS AND RETURN RAIL CONFIGURATIONS.
 - 6. ALL 500 KCMIL CABLES ARE ROPELAY
 - 7. CROSS BONDING SHALL NOT BE COMBINED WITH NEGATIVE RETURN AT SUBSTATION.

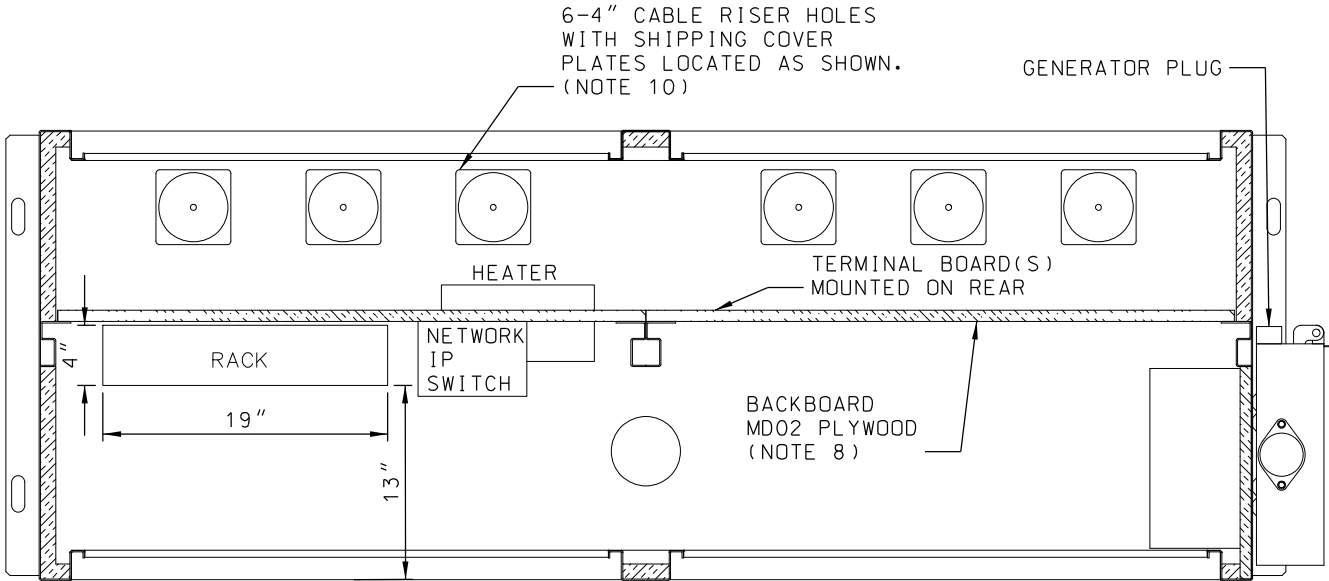


- SIGNAL AND POWER BONDING KEY**
- (A) 1-#6 BOND STRAND (TRACK CIRCUIT JUMPER)
 - (B) 3-500 KCMIL
 - (C) 2-250 KCMIL
 - (D) 2-500 KCMIL
-
- INSULATED JOINT
 - SIGNAL RAIL
 - NEGATIVE RETURN RAIL

REV	DATE	DESCRIPTION	DESIGNED BY AJW		<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>TRAIN CONTROL TURNOUT BONDING</div>	SCALE FOR 22"x34": NOT TO SCALE	
			CHECKED BY JLM			 <div>HDR Engineering, Inc. 10450 Holmes Road Suite 600 Kansas City, MO 64131-3471 816-360-2700 Certificate of Authority: 000856</div>	NOT FOR CONSTRUCTION				FILENAME:	
			DRAWN BY ZJ								N607	
			CHECKED BY AJW								CONTRACT NO.:	
			APPROVED BY NKS								CONTRACT NO. ***	
PLOT DATE: 12/22/2022			DATE 12-23-2022	4:32:58 PM		VOLUME:						
						I						
						DRAWING NO.:					SHEET NO.:	
					N607	453						



TYPICAL SIGNAL CASE LAYOUT



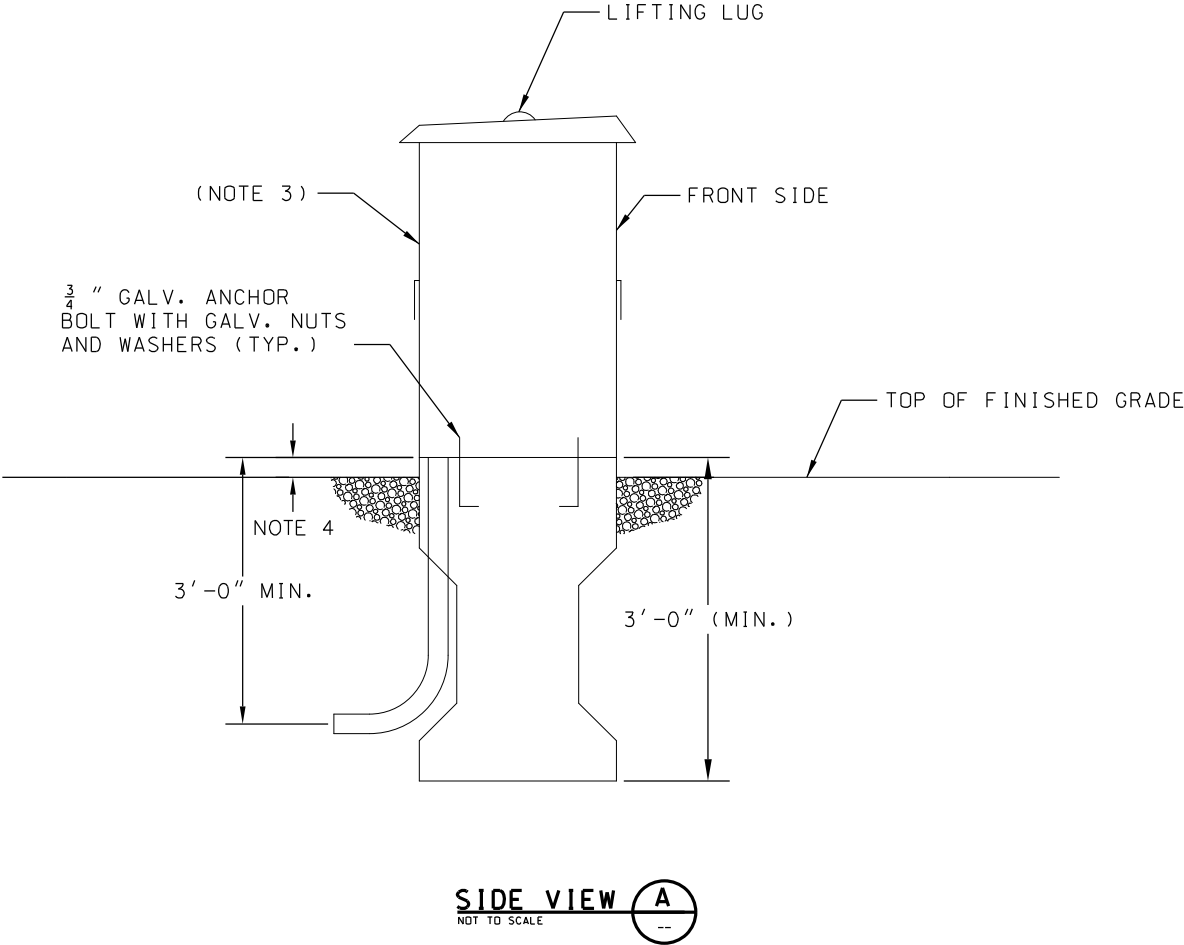
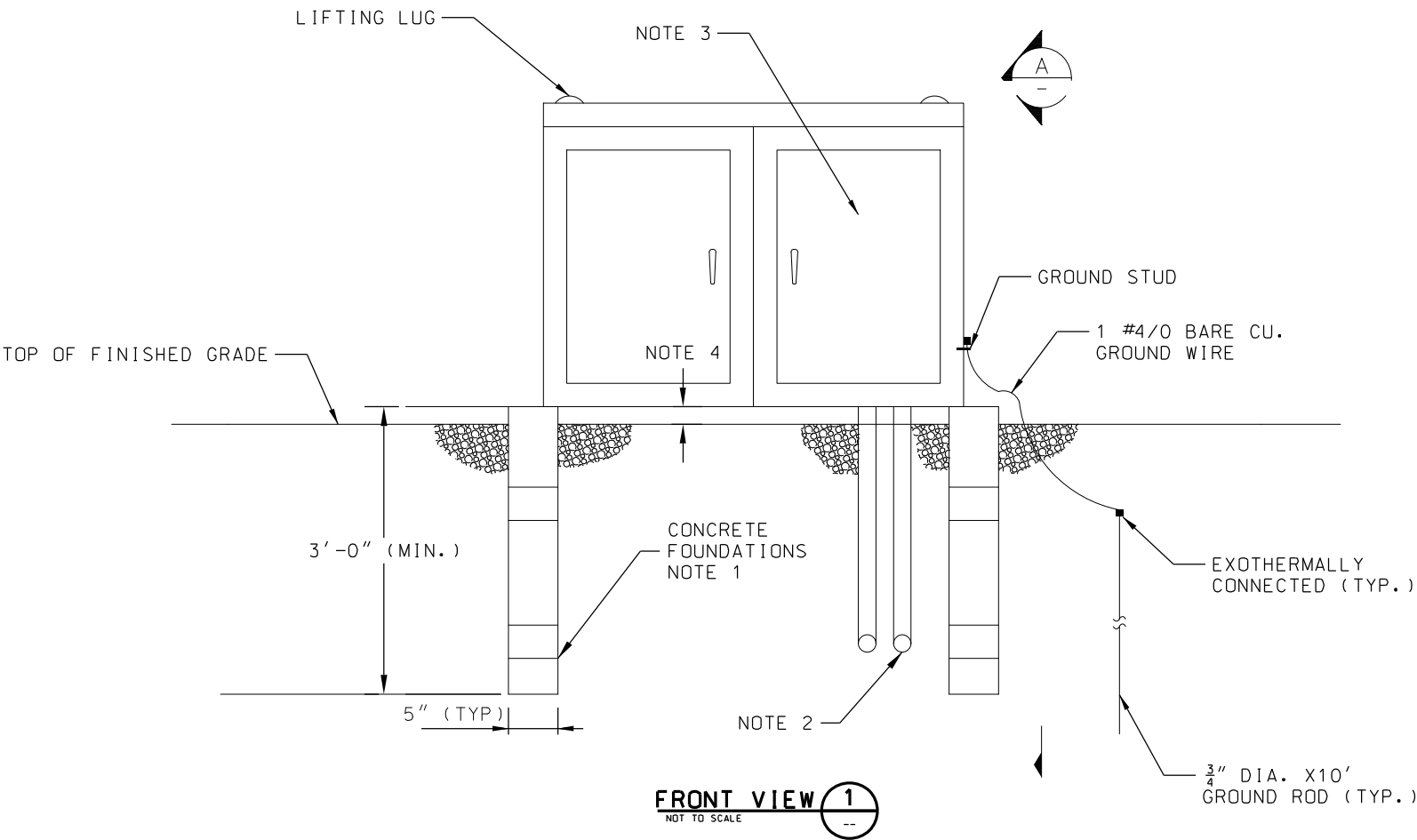
BACK PANEL DIMENSIONS



NOTES:

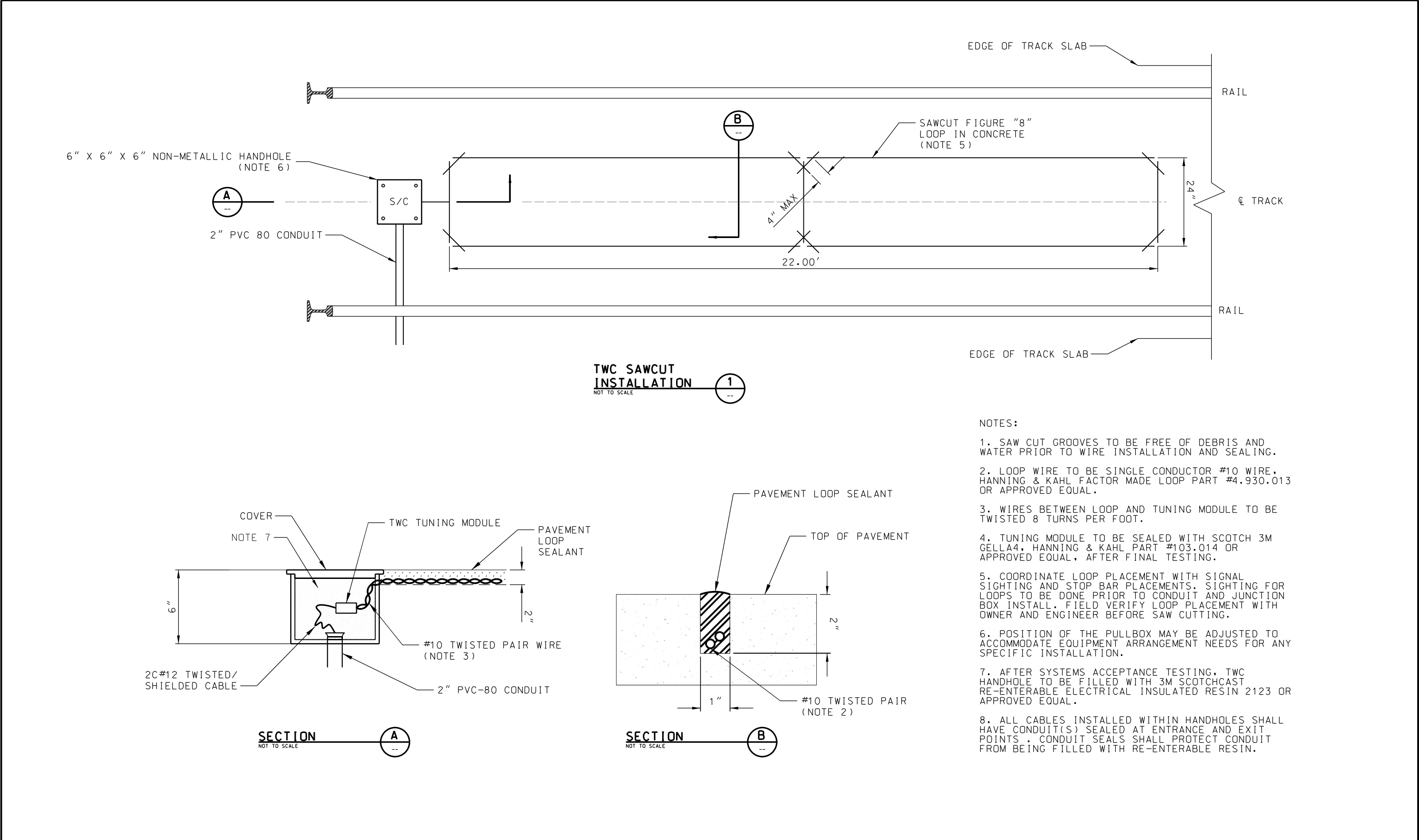
1. THIS CABINET ARRANGEMENT IS INTENDED AS A GUIDE FOR EQUIPMENT ARRANGEMENT ONLY.
2. CABINET BASIS OF DESIGN IS PTMW P/N 41055E 74"x81"x30" CASE WITH ELECTRICAL & GENERATOR PLUG.
3. THE EQUIPMENT SHOWN IS FOR INFORMATION ONLY. THE ACTUAL EQUIPMENT INSTALLED SHALL BE CHOSEN BY THE CONTRACTOR TO MEET THE FUNCTIONAL NEEDS OF INTERLOCKING EQUIPMENT AND WILL BE SUBMITTED TO THE FOR APPROVAL PRIOR TO FABRICATION.
4. THE CABINET WILL BE GALVANNEALED STEEL, WITH A FRONT AND A BACK DOOR FOR ACCESSING EQUIPMENT MOUNTED ON EACH SIDE. THE RACK MAY BE ELIMINATED IF IT IS SHOWN THAT BOARD MOUNTING IS DESIREABLE.
5. THE DIMENSIONS OF THE CABINET ARE SHOWN FOR REFERENCE ONLY, THE CABINET SHALL NOT BE HIGHER THAN 84 INCHES ABOVE THE SITE PAVING LEVEL. ACTUAL DIMENSIONS SHALL BE SHOWN ON THE CABINET DESIGN SUBMITTED TO THE ENGINEER FOR APPROVAL.
6. THE CONTRACTOR SHALL POST DRILL THE ANCHOR BOLTS FOR THE CABINET AT THE TIME OF INSTALLATION, USING A CHEMICAL TYPE ANCHOR DESIGNED FOR THE SPECIFIC INSTALLATION.
7. THE DESIGNER SHALL UTILIZE BOTH SIDES OF THE RACK FOR WIRING AND FOR EQUIPMENT MOUNTING FOR DEVICES SUCH AS 110VAC POWER DISTRIBUTION CIRCUIT BREAKERS, DIN RAIL MOUNTED TERMINALS, LIGHTNING AND SURGE PROTECTION, ETC.
8. 3/4" THICK PLYWOOD BACKBOARD INSTALLED AND FINISHED WITH WHITE LATEX ENAMEL PAINT. THE TOP 11" OF BOARD CAN BE REMOVED TO BE ABLE TO INSTALL ONE ROW OF RELAYS.
9. SP BACKBOARD SHALL ACCOMODATE 19" RACK FRAME MOUNTED TO INTERNAL CASE CHASSIS. SEE TECHNICAL SPECIFICATIONS FOR ADDITIONAL GUIDANCE.
10. SIZING IS TYPICAL. MULTIPLE SIZE CONDUIT MAY ENTER CONDUIT RISERS.

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			CHECKED BY	JLM				10450 Holmes Road Suite 600 Kansas City, MO 64131-3471 816-360-2700 Certificate of Authority: 000856	TRAIN CONTROL TYPICAL SIGNAL CASE LAYOUT RELAY CASE			FILENAME:	
			DRAWN BY	ZJ							N608		
			CHECKED BY	AJW							CONTRACT NO.:		
			APPROVED BY	NKS							CONTRACT NO. ***		
PLOT DATE: 12/22/2022			4:33:01 PM		DATE		12-23-2022	NOT FOR CONSTRUCTION				DRAWING NO.:	SHEET NO.:
										N608	454		

- NOTES:
- 1. CONTRACTOR SHALL INSTALL PRECAST FOUNDATIONS AS REQUIRED BY FIELD CONSTRAINTS.
 - 2. INSTALL CONDUITS AS REQUIRED. REFER TO SYSTEMWIDE ELECTRICAL PLANS FOR DETAILS.
 - 3. SIZING OF CASE AND FOUNDATION TO BE PROVIDED IN THE FINAL DESIGN.
 - 4. CASE SHALL BE APPROXIMATELY 6" ABOVE FINISHED GRADE.
 - 5. FINISHED GRADE SHALL CONSIST OF PEA GRAVEL APPROXIMATELY 6" DEEP SURROUNDING CASE ON ALL SIDES.



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			CHECKED BY	JLM			 <div>HDR Engineering, Inc. 10450 Holmes Road Suite 600 Kansas City, MO 64131-3471 816-360-2700 Certificate of Authority: 000856</div>		NOT FOR CONSTRUCTION						TRAIN CONTROL TYPICAL SIGNAL CASE FOUNDATION AND GROUNDING DETAILS	
			DRAWN BY	ZJ							FILENAME:					
			CHECKED BY	AJW							N609					
			APPROVED BY	NKS							CONTRACT NO.:					
											CONTRACT NO. ***					
							VOLUME:									
PLOT DATE: 12/22/2022			4:33:04 PM			DATE: 12-23-2022					DRAWING NO.:		SHEET NO.:			
											N609		455			



- NOTES:
1. SAW CUT GROOVES TO BE FREE OF DEBRIS AND WATER PRIOR TO WIRE INSTALLATION AND SEALING.
 2. LOOP WIRE TO BE SINGLE CONDUCTOR #10 WIRE, HANNING & KAHL FACTOR MADE LOOP PART #4.930.013 OR APPROVED EQUAL.
 3. WIRES BETWEEN LOOP AND TUNING MODULE TO BE TWISTED 8 TURNS PER FOOT.
 4. TUNING MODULE TO BE SEALED WITH SCOTCH 3M GELLA4, HANNING & KAHL PART #103.014 OR APPROVED EQUAL, AFTER FINAL TESTING.
 5. COORDINATE LOOP PLACEMENT WITH SIGNAL SIGHTING AND STOP BAR PLACEMENTS. SIGHTING FOR LOOPS TO BE DONE PRIOR TO CONDUIT AND JUNCTION BOX INSTALL. FIELD VERIFY LOOP PLACEMENT WITH OWNER AND ENGINEER BEFORE SAW CUTTING.
 6. POSITION OF THE PULLBOX MAY BE ADJUSTED TO ACCOMMODATE EQUIPMENT ARRANGEMENT NEEDS FOR ANY SPECIFIC INSTALLATION.
 7. AFTER SYSTEMS ACCEPTANCE TESTING, TWC HANDHOLE TO BE FILLED WITH 3M SCOTCHCAST RE-ENTERABLE ELECTRICAL INSULATED RESIN 2123 OR APPROVED EQUAL.
 8. ALL CABLES INSTALLED WITHIN HANDHOLES SHALL HAVE CONDUIT(S) SEALED AT ENTRANCE AND EXIT POINTS. CONDUIT SEALS SHALL PROTECT CONDUIT FROM BEING FILLED WITH RE-ENTERABLE RESIN.

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			CHECKED BY JLM			 HDR Engineering, Inc. 10450 Holmes Road Suite 600 Kansas City, MO 64131-3471 816-360-2700 Certificate of Authority: 000856	NOT FOR CONSTRUCTION			FILENAME:	
			DRAWN BY ZJ							N610	
			CHECKED BY AJW							CONTRACT NO.:	
			APPROVED BY NKS							CONTRACT NO. ***	
PLOT DATE: 12/22/2022			4:33:07 PM	DATE	12-23-2022			DRAWING NO.:	SHEET NO.:		
								N610	456		

TRAIN CONTROL CABLE/CONDUIT SCHEDULES																		
CONDUIT ID	FROM	NORTHING	EASTING	TO	NORTHING	EASTING	CONDUIT SIZE (IN.)	QUANTITY	CABLE 1		CABLE 2		CABLE 3		CABLE 4		CABLE 5	
		STATIONING	OFFSET		STATIONING	OFFSET			TYPE	QTY.	TYPE	QTY.	TYPE	QTY.	TYPE	QTY.	TYPE	QTY.
3RD-SC-01	EX-HH-01	1071838.102	2765606.567	3RD-SW3-JB	200+02	0.00	4	1	7C#6	1	12C#14	1						
3RD-SC-02	EX-HH-01	1071838.102	2765606.567	3RD-SC-RAB-01	200+21	-3.18	4	1	2C#6 TW	1								
3RD-SC-03	3RD-SC-RAB-01	200+21	-3.18	3RD-SC-RAB-02	200+13	3.11	2	1	BONDSTRAND	1								
3RD-SC-04	EX-HH-02	201+13	25.59	3RD SIGNAL-8	200+65	-17.9	2	1	7C#9	1								
3RD-SC-05	3RD-SC-RAB-03	200+79	-3.15	3RD-SC-RAB-04	200+80	3.15	4	1	2C#6 TW	1								
3RD-SC-06	EX-HH-02	201+13	25.59	3RD-SC-RAB-03	200+79	-3.15	2	1	BONDSTRAND	1								
3RD-SC-07	EX-HH-02	201+13	25.59	3RD SIGNAL-2	200+85	48.17	2	1	7C#9	1								
3RD-SC-08	EX-HH-03	201+18	25.68	3RD-L8-TWC-JB	201+17	0.00	2	1	2C#12 TW	1								
3RD-SC-09	EX-HH-03	201+18	25.68	3RD-L2B-TWC-JB	201+51	20.41	2	1	2C#12 TW	1								
3RD-SC-10	EX-HH-02	201+13	25.59	EX-HH-03	201+18	25.68	4	1	2C#12 TW	2								
3RD-TE-01	EX-HH-01	1071838.102	2765606.567	3RD-SW3-JB	200+02	0.00	2	1	1C#6 2KV	5								
3RD-TE-02	3RD-TE-RAB-01	200+88	-3.15	3RD-TE-RAB-02	200+88	3.15	2-1/2	2	500KCMIL	3								
TRAIN CONTROL CABLE/CONDUIT SCHEDULES																		
CONDUIT ID	FROM	STATIONING	OFFSET	TO	STATIONING	OFFSET	CONDUIT SIZE (IN.)	QUANTITY	CABLE 1		CABLE 2		CABLE 3		CABLE 4		CABLE 5	
									TYPE	QTY.	TYPE	QTY.	TYPE	QTY.	TYPE	QTY.	TYPE	QTY.
2ND-SC-01	2ND-HH-01	203+37	39.42	2ND-L6-TWC-JB	203+15	14.00	2	1	2C#12 TW	1								
2ND-SC-02	2ND-HH-01	203+37	39.42	2ND-SC-RAB-02	203+31	3.15	4	1	2C#6 TW	1								
2ND-SC-03	2ND-SC-RAB-01	203+31	-3.15	2ND-SC-RAB-02	203+31	3.15	2	1	BONDSTRAND	1								
2ND-SC-04	2ND-SC-RAB-01	203+31	-3.15	2ND-TE-RAB-01	203+23	-3.15	2	1										
2ND-SC-05	2ND-SC-RAB-03	203+31	10.85	2ND-SC-RAB-04	203+31	17.15	2	1	BONDSTRAND	1								
2ND-SC-06	2ND-HH-01	203+37	39.42	2ND-SC-RAB-04	203+31	17.15	4	1	2C#6 TW	1								
2ND-SC-07	2ND-HH-01	203+37	39.42	2ND-SC-RAB-11	204+40	3.15	4	1	2C#6 TW	1								
2ND-SC-08	2ND-HH-01	203+37	39.42	2ND-SW1-JB	203+42	14.00	4	1	7C#6	1	12C#14	1						
2ND-SC-09	2ND-HH-01	203+37	39.42	2ND-SC-RAB-13	204+40	17.15	4	1	2C#6 TW	1								
2ND-SC-10	2ND-HH-01	203+37	39.42	2ND-SC-RAB-06	203+73	24.45	4	1	2C#6 TW	1								
2ND-SC-11	2ND-SC-RAB-05	203+63	10.96	2ND-SC-RAB-06	203+73	24.45	2	1	BONDSTRAND	1								
2ND-SC-12	2ND-SC-RAB-06	203+73	24.45	2ND-SC-RAB-07	203+78	20.19	2	1	BONDSTRAND	1								
2ND-SC-13	2ND-SC-RAB-10	204+40	-3.15	2ND-SC-RAB-11	204+40	3.15	2	1	BONDSTRAND	1								
2ND-SC-14	2ND-SC-RAB-10	204+40	-3.15	2ND-TE-RAB-05	204+49	-3.15	2	1										
2ND-SC-15	2ND-SC-RAB-12	204+40	10.85	2ND-SC-RAB-13	204+40	17.15	2	1	BONDSTRAND	1								
2ND-SC-16	2ND-SC-RAB-13	204+40	17.15	2ND-TE-RAB-08	204+49	17.15	2	1										
2ND-SC-17	2ND-HH-01	203+37	39.42	2ND-HH-02	204+00	61.35	4	3	7C#6	2	12C#14	2	2C#12 TW	4	2C#6 TW	6	7C#9	3
2ND-SC-18	2ND-HH-02	204+00	61.35	2ND-SC-RAB-15	204+08	56.93	4	1	2C#6 TW	1								
2ND-SC-19	2ND-SC-RAB-14	204+14	54.37	2ND-SC-RAB-15	204+08	56.93	2	1	BONDSTRAND	1								
2ND-SC-20	2ND-HH-02	204+00	61.35	2ND-L2-TWC-JB	204+16	64.92	2	1	2C#12 TW	1								
2ND-SC-21	2ND-HH-02	204+00	61.35	2ND-RC	204+02	71.16	4	4	7C#6	2	12C#14	2	2C#12 TW	6	2C#6 TW	8	7C#9	5
2ND-SC-21	2ND-HH-02	204+00	61.35	2ND-RC	204+02	71.16	SEE ABOVE	SEE ABOVE	7C#14	1								
2ND-SC-22	2ND-RC	204+02	71.16	2ND-SWHTRC	204+00	65.49	4	1	7C#14	1								
2ND-SC-23	2ND-HH-02	204+00	61.35	SPLICE VAULT	203+87	54.91	2	1	12SMFO	1								
2ND-SC-24	2ND-HH-01	203+37	39.42	2ND-L4-TWC-JB	204+56	14.00	2	1	2C#12 TW	1								
2ND-SC-25	2ND-HH-02	204+00	61.35	2ND-L8-TWC-JB	204+28	62.80	2	1	2C#12 TW	1								
2ND-SC-26	2ND-HH-01	203+37	39.42	2ND-L10-TWC-JB	204+56	0.00	2	1	2C#12 TW	1								
2ND-SC-27	2ND-HH-01	203+37	39.42	2ND-L12-TWC-JB	203+15	0.00	2	1	2C#12 TW	1								
2ND-SC-28	2ND-SC-RAB-16	204+21	53.85	2ND-SC-RAB-17	204+26	51.22	2	1	BONDSTRAND	1								
2ND-SC-29	2ND-HH-02	204+00	61.35	2ND-SC-RAB-16	204+21	53.85	4	1	2C#6 TW	1								
2ND-SC-30	2ND-SC-RAB-09	204+04	17.2	2ND-SC-RAB-20	204+05	21.83	2	1	BONDSTRAND	1								
2ND-SC-31	2ND-SC-RAB-18	203+86	6.25	2ND-SC-RAB-19	203+80	10.50	2	1	BONDSTRAND	1								
2ND-SC-32	2ND-HH-01	203+37	39.42	2ND-SC-RAB-19	203+80	10.50	4	1	2C#6 TW	1								
2ND-SC-33	2ND-SC-RAB-08	203+77	10.91	2ND-SC-RAB-19	203+80	10.50	2	1	BONDSTRAND	1								
2ND-SC-36	2ND-HH-01	203+37	39.42	2ND-SIGNAL 10	204+27	-18.95	2	1	7C#9	1								
2ND-SC-37	2ND-HH-01	203+37	39.42	2ND-SIGNAL 12	203+67	-19.85	2	1	7C#9	1								
2ND-SC-38	2ND-HH-02	204+00	61.35	2ND-SIGNAL 2	203+92	50.42	2	1	7C#9	1								
2ND-SC-39	2ND-HH-02	204+00	61.35	2ND-SIGNAL 8	204+49	41.97	2	1	7C#9	1								
2ND-SC-40	2ND-HH-02	204+00	61.35	TRAFFIC HANDHOLE	203+87	52.93	2	1	7C#14	1								


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			CHECKED BY	JLM			 <div>HDR Engineering, Inc. 10450 Holmes Road Suite 600 Kansas City, MO 64131-3471 816-360-2700 Certificate of Authority: 000856</div>		NOT FOR CONSTRUCTION		TRAIN CONTROL CABLE/CONDUIT SCHEDULE				FILENAME:	
			DRAWN BY	ZJ											CONTRACT NO.:	
			CHECKED BY	AJW											CONTRACT NO. ***	
			APPROVED BY	NKS											VOLUME:	
PLOT DATE: 12/23/2022			3:26:26 PM		DATE	12-23-2022					DRAWING NO.:				SHEET NO.:	
											N611				457	

TRAIN CONTROL CABLE/CONDUIT SCHEDULES																		
CONDUIT ID	FROM	STATIONING	OFFSET	TO			CONDUIT SIZE (IN.)	QUANTITY	CABLE 1		CABLE 2		CABLE 3		CABLE 4		CABLE 5	
									TYPE	QTY.	TYPE	QTY.	TYPE	QTY.	TYPE	QTY.	TYPE	QTY.
2ND-TE-01	2ND-TE-RAB-01	203+23	-3.15	2ND-TE-RAB-02	203+23	3.15	2-1/2	2	500KCMIL	3								
2ND-TE-02	2ND-TE-RAB-02	203+23	3.15	2ND-TE-RAB-03	203+23	10.85	2-1/2	2	500KCMIL	3								
2ND-TE-03	2ND-TE-RAB-03	203+23	10.85	2ND-TE-RAB-04	203+23	17.15	2-1/2	2	500KCMIL	3								
2ND-TE-04	2ND-SWHTRC	204+00	65.49	2ND-SW1-JB	203+42	14.00	3	1	1C #6 2KV	5								
2ND-TE-05	2ND-TE-RAB-05	204+49	-3.15	2ND-TE-RAB-06	204+49	3.15	2-1/2	2	500KCMIL	3								
2ND-TE-06	2ND-TE-RAB-06	204+49	3.15	2ND-TE-RAB-07	204+49	10.85	2-1/2	2	500KCMIL	3								
2ND-TE-07	2ND-TE-RAB-07	204+49	10.85	2ND-TE-RAB-08	204+49	17.15	2-1/2	2	500KCMIL	3								
2ND-TE-09	2ND-TE-RAB-09	204+16	58.97	2ND-TE-RAB-10	204+11	61.71	2-1/2	2	500KCMIL	3								
2ND-TE-10	2ND-TE-RAB-12	204+23	59.86	2ND-TE-RAB-09	204+16	58.97	2-1/2	2	500KCMIL	3								
2ND-TE-11	2ND-TE-RAB-11	204+29	57.27	2ND-TE-RAB-12	204+23	59.86	2-1/2	2	500KCMIL	3								
2ND-TE-12	POWER SERVICE	204+78	220.74	2ND-RC	204+02	71.16	2	1	3C #2 W/GND	1								
2ND-TE-13	POWER SERVICE	204+78	220.74	2ND-SWHTRC	204+00	65.49	2	1	3C #2 W/GND	1								
2ND-TE-14	2ND-SWHTRC	204+00	65.49	2ND-SW3-JB	203+43	0.00	3	1	1C #6 2KV	5								
TRAIN CONTROL CABLE/CONDUIT SCHEDULES																		
CONDUIT ID	FROM	STATIONING	OFFSET	TO			CONDUIT SIZE (IN.)	QUANTITY	CABLE 1		CABLE 2		CABLE 3		CABLE 4		CABLE 5	
									TYPE	QTY.	TYPE	QTY.	TYPE	QTY.	TYPE	QTY.	TYPE	QTY.
FRNT-SC-01	FRNT-RC	225+55	-20.01	FRNT-HH-01	225+70	-21.05	4	2	2C #12 TW	6								
FRNT-SC-02	FRNT-HH-01	225+70	-21.05	FRNT-L2-TWC-JB	227+91	0.00	2	1	2C #12 TW	1								
FRNT-SC-03	FRNT-HH-01	225+70	-21.05	FRNT-L4-TWC-JB	226+31	0.00	2	1	2C #12 TW	1								
FRNT-SC-04	FRNT-HH-01	225+70	-21.05	FRNT-L6-TWC-JB	226+63	15.78	2	1	2C #12 TW	1								
FRNT-SC-05	FRNT-HH-01	225+70	-21.05	FRNT-L8-TWC-JB	225+59	0.00	2	1	2C #12 TW	1								
FRNT-SC-06	FRNT-HH-01	225+70	-21.05	FRNT-L10-TWC-JB	225+59	16.00	2	1	2C #12 TW	1								
FRNT-SC-07	FRNT-HH-01	225+70	-21.05	FRNT-L12-TWC-JB	223+21	16.00	2	1	2C #12 TW	1								
FRNT-SC-08	FRNT-HH-01	225+70	-21.05	TRAFFIC CABINET	225+49	-13.53	2	1	7C #14	1								
FRNT-SC-09	FRNT-HH-01	225+70	-21.05	SPLICE VAULT	225+66	-17.55	2	1	12SMFO	1								
FRNT-TE-01	FRNT-RC	225+55	-20.01	POWER SERVICE	223+02	-18.75	2	1	3C #2 W/GND	1								
TRAIN CONTROL CABLE/CONDUIT SCHEDULES																		
CONDUIT ID	FROM	STATIONING	OFFSET	TO			CONDUIT SIZE (IN.)	QUANTITY	CABLE 1		CABLE 2		CABLE 3		CABLE 4		CABLE 5	
									TYPE	QTY.	TYPE	QTY.	TYPE	QTY.	TYPE	QTY.	TYPE	QTY.
RIVR-SC-01	RIVR-HH-01	235+78	18.6	RIVR-L6-TWC-JB	235+32	0.00	2	1	2C #12 TW	1								
RIVR-SC-02	RIVR-HH-01	235+78	18.6	RIVR-SIGNAL 6	235+51	-8.50	2	1	7C #9	1								
RIVR-SC-03	RIVR-HH-01	235+78	18.6	SC-RAB-01	235+55	3.15	4	1	2C #6 TW	1								
RIVR-SC-04	SC-RAB-01	235+55	3.15	SC-RAB-02	235+55	-3.15	2	1	BONDSTRAND	1								
RIVR-SC-05	SC-RAB-03	235+55	10.85	SC-RAB-04	235+55	17.15	2	1	BONDSTRAND	1								
RIVR-SC-06	RIVR-HH-01	235+78	18.6	RIVR-L8-TWC-JB	235+32	14.00	2	1	2C #12 TW	1								
RIVR-SC-07	RIVR-HH-01	235+78	18.6	SC-RAB-04	235+55	17.15	4	1	2C #6 TW	1								
RIVR-SC-08	RIVR-HH-01	235+78	18.6	RIVR-SIGNAL 8	235+51	25.00	2	1	7C #9	1								
RIVR-SC-09	RIVR-RC	236+08	19.67	RIVR-HH-01	235+78	18.60	4	2	2C #6 TW	2	7C #9	1	2C #12 TW	2				
RIVR-SC-10	RIVR-HH-02	146+65	4.91	SC-RAB-06	236+11	3.15	4	1	2C #6 TW	1								
RIVR-SC-11	SC-RAB-05	236+20	-3.15	SC-RAB-06	236+11	3.15	2	1	BONDSTRAND	1								
RIVR-SC-12	RIVR-RC	236+08	19.67	RIVR-HH-02	146+65	4.91	4	2	2C #6 TW	4	7C #9	1	2C #12 TW	1	7C #6	1	12C #14	1
RIVR-SC-13	RIVR-RC	236+08	19.67	SPLICE VAULT	236+17	24.18	2	1	12SMFO	1								
RIVR-SC-14	RIVR-RC	236+08	19.67	RIVR-SWHTRC	236+02	21.35	4	1	7C #14	1								
RIVR-SC-15	RIVR-HH-02	146+65	4.91	RIVR-HH-03	148+68	5.47	4	2	2C #6 TW	3	7C #9	1	2C #12 TW	1				
RIVR-SC-16	RIVR-HH-03	148+68	5.47	RIVR-SIGNAL 4	148+86	-5.93	2	1	7C #9	1								
RIVR-SC-17	RIVR-HH-03	148+68	5.47	RIVR-L4-TWC-JB	148+97	0.00	2	1	2C #12 TW	1								
RIVR-SC-18	RIVR-HH-03	148+68	5.47	SC-RAB-07	148+84	3.15	4	1	2C #6 TW	2								
RIVR-SC-19	SC-RAB-07	148+84	3.15	SC-RAB-08	148+84	-3.15	2	1	2C #6 TW	1	BONDSTRAND	1						
RIVR-SC-20	RIVR-HH-03	148+68	5.47	SC-RAB-12	149+70	3.15	4	1	2C #6 TW	1								
RIVR-SC-21	SC-RAB-08	148+84	-3.15	SC-RAB-09	148+93	-3.15	2	1	2C #6 TW	1								
RIVR-SC-22	SC-RAB-09	148+93	-3.15	SC-RAB-10	148+93	3.15	2	1	BONDSTRAND	1								
RIVR-SC-23	SC-RAB-11	149+70	-3.15	SC-RAB-12	149+70	3.15	2	1	BONDSTRAND	1								
RIVR-SC-24	RIVR-HH-02	146+65	4.91	RIVR-SW1B-JB	236+46	0.00	4	1	7C #6	1	12C #14	1						
RIVR-TE-01	TE-RAB-01	235+46	-3.15	TE-RAB-02	235+46	3.15	2-1/2	2	500KCMIL	3								
RIVR-TE-02	TE-RAB-02	235+46	3.15	TE-RAB-03	235+46	10.85	2-1/2	2	500KCMIL	3								
RIVR-TE-03	TE-RAB-03	235+46	10.85	TE-RAB-04	235+46	17.15	2-1/2	2	500KCMIL	3								
RIVR-TE-04	RIVR-SWHTRC	236+02	21.35	RIVR-SW1B-JB	236+46	0.00	3	1	1C #6 2KV	5								
RIVR-TE-05	RIVR-SWHTRC	236+02	21.35	POWER SERVICE	235+87	40.60	2	1	3C #2 W/GND	1								
RIVR-TE-06	RIVR-RC	236+08	19.67	POWER SERVICE	235+87	40.60	2	1	3C #2 W/GND	1								
RIVR-TE-07	TE-RAB-05	149+79	-3.15	TE-RAB-06	149+79	3.15	2-1/2	2	500KCMIL	3								

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			CHECKED BY	JLM			 HDR Engineering, Inc. 10450 Holmes Road Suite 600 Kansas City, MO 64131-3471 816-360-2700 Certificate of Authority: 000856	TRAIN CONTROL CABLE/CONDUIT SCHEDULE							FILENAME:	
			DRAWN BY	ZJ								N612				
			CHECKED BY	AJW								CONTRACT NO.:				
			APPROVED BY	NKS								CONTRACT NO. ***				
PLOT DATE: 12/23/2022			3:25:53 PM				DATE 12-23-2022			DRAWING NO.:		SHEET NO.:				
							NOT FOR CONSTRUCTION			N612		458				

TRAIN CONTROL QUANTITIES			
ITEM	UNIT	TOTAL QUANTITY/LENGTH	NOTES
2" PVC CONDUIT TOTAL	LF.	3073	
3" PVC CONDUIT TOTAL	LF.	245	
4" PVC CONDUIT TOTAL	LF.	1671	
2-1/2" PVC CONDUIT TOTAL	LF.	215	
12C#14 SWITCH INDICATION CABLE	LF.	763	
12SMFO CABLE	LF.	0	COVERED IN COMMUNICATIONS QUANTITIES
1C#6 2KV SWITCH HEATER CABLES	LF.	3112	
2C#12 TW ST TWC CABLE	LF.	3404	
2C#6 TW TRACK CIRCUIT CABLE	LF.	3147	
3C#2 W/GND POWER CABLE	LF.	740	
500KCMIL NEGATIVE RETURN CABLE	LF.	1162	
7C#14 SWITCH HEATER CONTROL CABLE	LF.	284	
7C#6 SWITCH MACHINE CONTROL CABLE	LF.	763	
7C#9 SIGNAL CABLE	LF.	1979	
1C#6 BONDSTRAND TRACK CIRCUIT CABLE	LF.	874	
TWC LOOPS AND TWC HANDHOLES	EA.	17	
TWC INTERROGATORS	EA.	3	
SWITCH HEATER CABINETS	EA.	2	
SWITCH HEATER BLOCKOUTS	EA.	6	
RELAY CASE/FOUNDATION	EA.	3	
ELECTRIC SWITCH MACHINES	EA.	4	
GROUND MOUNTED SIGNALS/FOUNDATIONS	EA.	3	
OCS MOUNTED SIGNALS	EA.	4	
RAIL ACCESS BOXES/LIDS	EA.	56	EACH RAIL
TRACK CIRCUITS	EA.	8	
MICROPROCESSORS	EA.	3	
INSULATED JOINTS	EA.	12	EACH RAIL NOT INCLUDING FACTORY MADE SPECIAL TRACKWORK JOINTS
TYPE 8 HANDHOLES	EA.	7	

NOTE: CABLE, CONDUIT, UNITS, AND QUANTITIES ARE ESTIMATES ONLY. CONTRACTOR SHALL VERIFY ACTUAL QUANTITIES AND UNITS.

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			CHECKED BY	AJW							N613	
			APPROVED BY	NKS							CONTRACT NO.:	
											CONTRACT NO. ***	
											VOLUME:	
											DRAWING NO.:	
											SHEET NO.:	
PLOT DATE: 12/22/2022											N613	
											459	