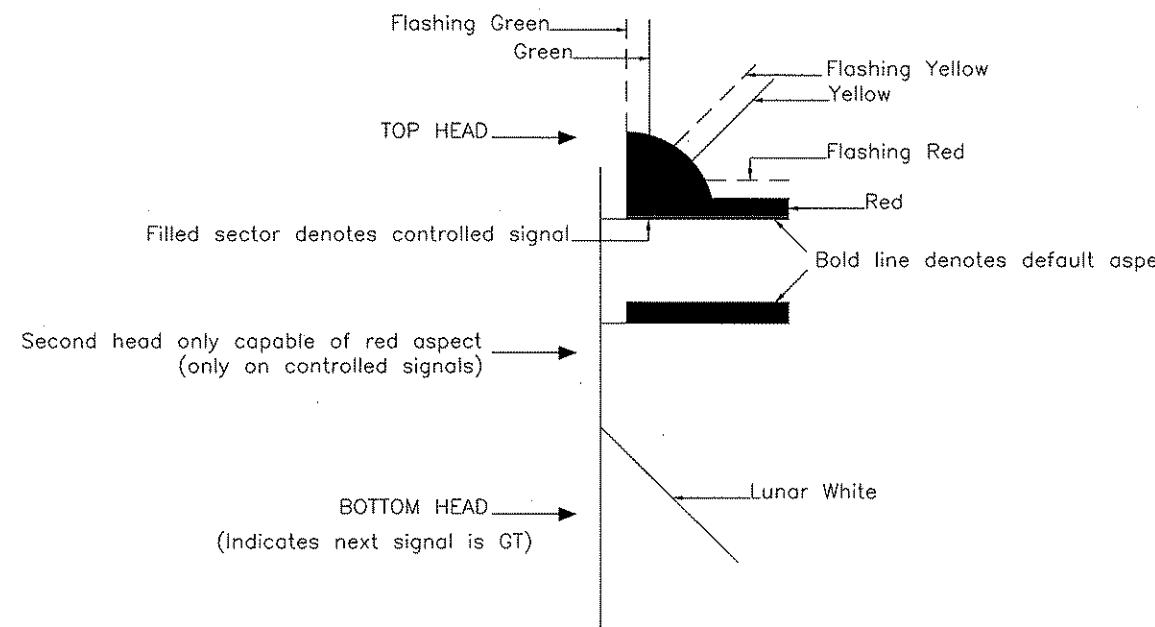
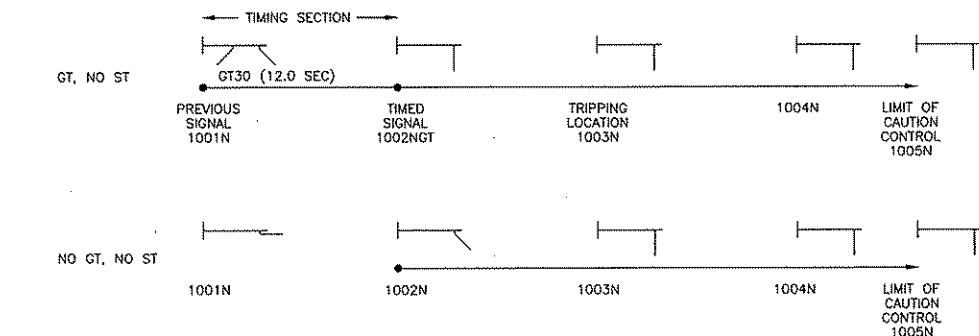


SIGNAL BLOCK PLAN AND CONTROL LINE DESIGN GENERAL NOTES

SEMAPHORE-STYLED SIGNAL SCHEMATIC

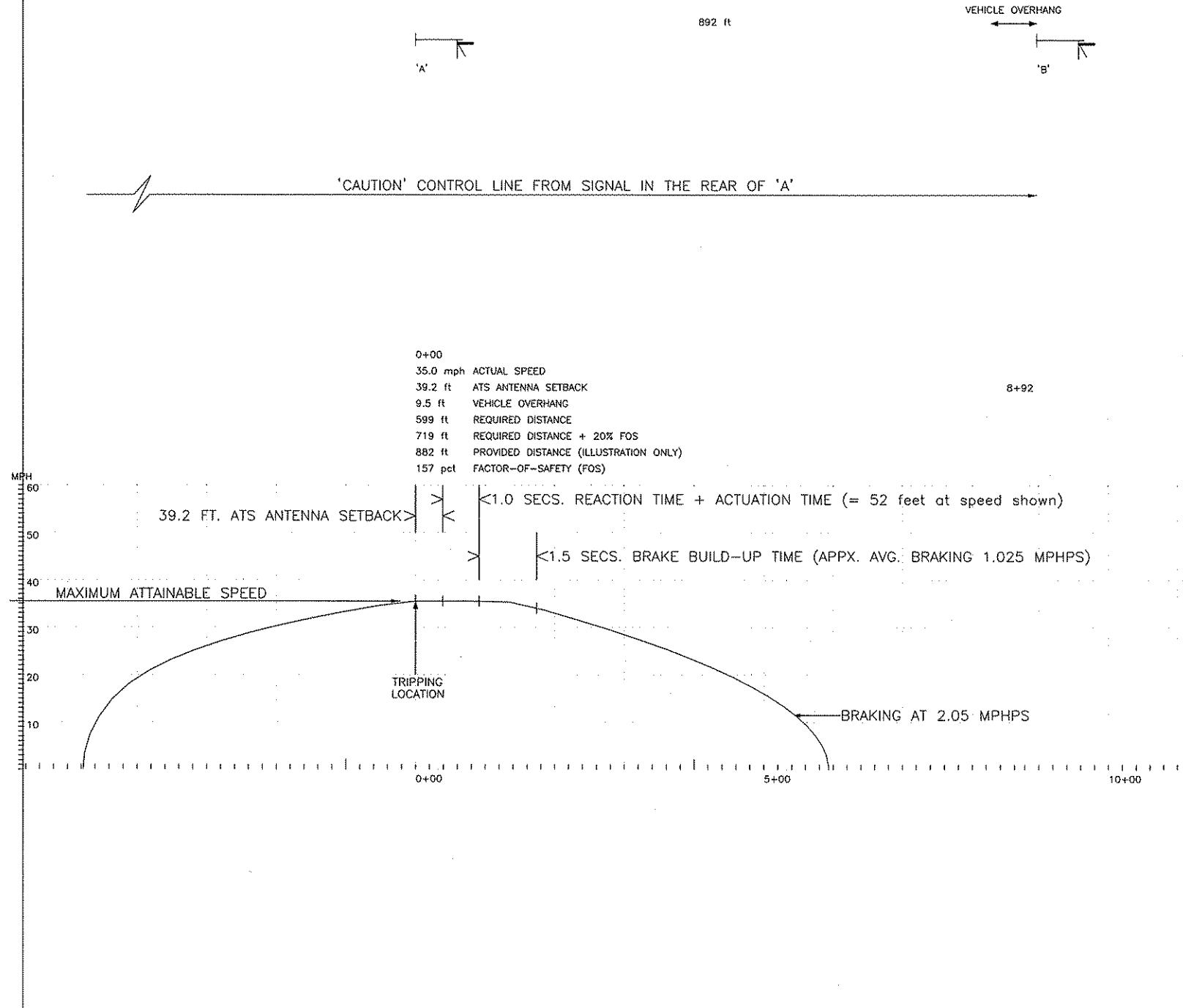


SAMPLE CONTROL LINE FORMAT



Gannett Fleming Transit & Rail Systems SYSTRA Consulting, Inc. Two Whipple Place - Suite 300 Lebanon, NH 03766-1356			<p>THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.</p>	MICHAEL T. MCNAMARA ENGINEER No. 37135-R APPROVED DATE <i>[Signature]</i>	DMJM HARRIS AECOM FOUR GATEWAY CENTER 20TH FLOOR PITTSBURGH, PA. 15222 <i>[Signature]</i> APPROVED DATE <i>[Signature]</i>	DESIGNED J OAKMAN DRAWN J TRAUM CHECKED J SAMEAN IN CHARGE CD JONES DATE APR. 26, 2008 SCALE NTS	PORT AUTHORITY OF ALLEGHENY COUNTY PITTSBURGH NORTH SHORE CONNECTOR NSC TRAIN SYSTEM (SYSTEM WIDE) BLOCK PLAN AND CONTROL LINES GENERAL NOTES	
							Port Authority CONTRACT NO. NSC-009 DWG. NO. SG001 SHT. 335	

SAMPLE BRAKING CURVE ILLUSTRATING SAFE BRAKING DISTANCE MODEL
VEHICLE TRIPPING AT SIGNAL 'A' AND ENTERING UNRECOVERABLE BRAKING PROFILE ON LEVEL TRACK



CALIBRATED
PERFORMANCE PROFILE
(35 mph Latch Speed Maximum Applies)

Velocity (mph)	Pounds Force
0.0	18,000
13.5	18,000
15.0	16,400
20.0	12,400
25.0	9,800
30.0	7,800
35.0	6,000
40.0	5,000
45.0	4,000
50.0	3,400
54.0	1,200

CALIBRATED BRAKING
FORCE PROFILE

Velocity (mph)	Pounds Force
0.0	9,446
1.0	9,444
2.0	9,441
3.0	9,438
4.0	9,435
5.0	9,431
6.0	9,427
7.0	9,423
8.0	9,418
9.0	9,414
10.0	9,409
11.0	9,403
12.0	9,397
13.0	9,392
14.0	9,385
15.0	9,379
16.0	9,372
17.0	9,365
18.0	9,358
19.0	9,350
20.0	9,342
21.0	9,334
22.0	9,325
23.0	9,316
24.0	9,307
25.0	9,298
26.0	9,288
27.0	9,278
28.0	9,268
29.0	9,257
30.0	9,246
31.0	9,235
32.0	9,224
33.0	9,212
34.0	9,200
35.0	9,188
36.0	9,175
37.0	9,162
38.0	9,149
39.0	9,136
40.0	9,122
41.0	9,108
42.0	9,094
43.0	9,079
44.0	9,064
45.0	9,049
46.0	9,034
47.0	9,018
48.0	9,002
49.0	8,986
50.0	8,969
51.0	8,952
52.0	8,935
53.0	8,917
54.0	8,900
55.0	8,882
56.0	8,863
57.0	8,845
58.0	8,826
59.0	8,806

VEHICLE CHARACTERISTICS

Weight: 103,618 lbs.

Length: 84.66 ft.

Frontal Area: 96.01 sq. ft.

Number of Axles: 6

DAVIS EQUATION
COEFFICIENTS

Rolling (Inertial) Resistance:

1.3 pounds force/ton

Journal Resistance:

29.0 pounds force

Flange Resistance:

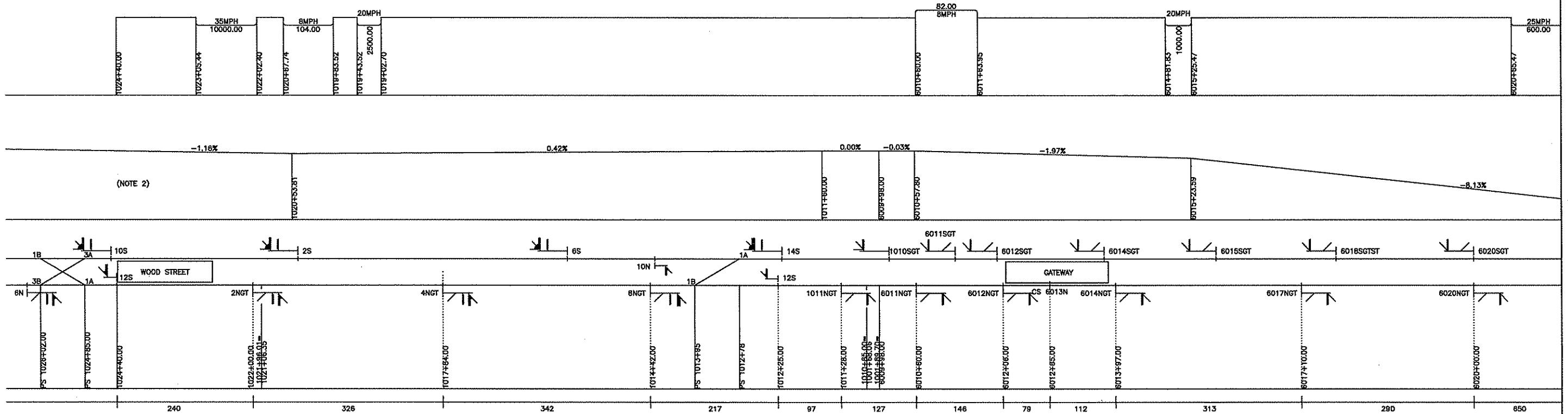
0.045 pounds force/(tons x mph)

Aerodynamic Resistance:

Open Air Lead:
0.0024 pounds force/(mph² x feet²)

Open Air Trailing:
0.000340 pounds force/(mph² x feet²)

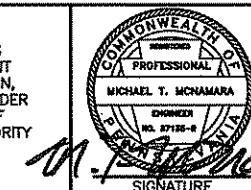
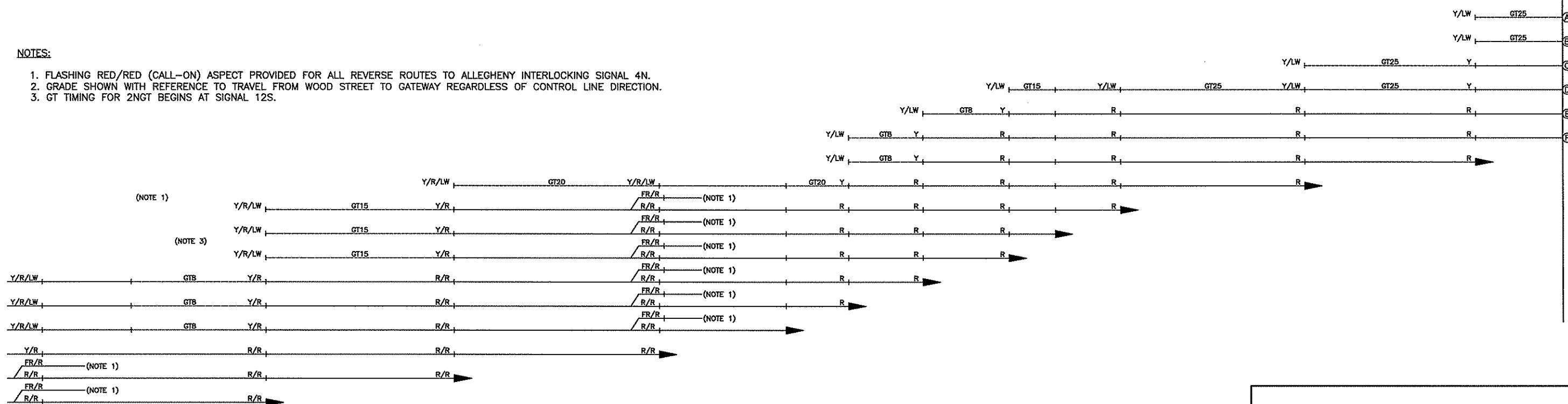
<p>Gannett Fleming Transit & Rail Systems</p>	<p>SYSTRA Consulting, Inc. Two Whipple Place - Suite 300 Lebanon, NH 03766-1356</p>			<p>MICHAEL T. MCNAMARA OWNER No. 37335-H PROFESSIONAL ENGINEER Pittsburgh, PA</p>	<p>DMJM HARRIS AECOM</p> <p>FOUR GATEWAY CENTER 20TH FLOOR PITTSBURGH, PA 15222</p> <p><i>[Handwritten signatures]</i></p> <p>Daniel J. Harris 4/28/08 APPROVED DATE</p>	<p>DESIGNED J. OAKMAN DRAWN J. TRAUM CHECKED J. SAMEAN IN CHARGE C. JONES DATE APR. 28, 2008 SCALE NTS</p>	<p>PORT AUTHORITY OF ALLEGHENY COUNTY PITTSBURGH</p> <p>NORTH SHORE CONNECTOR NSC TRAIN SYSTEM (SYSTEM WIDE) BLOCK PLAN AND CONTROL LINES SAMPLE BRAKING DISTANCE MODEL</p> <p>Port Authority</p> <p>CONTRACT NO. NSC-009 DWG. NO. SG002 SHT. 336</p>
		NO. DATE	DESCRIPTION				
		REVISIONS					



CONTINUED ON DWG NO. SG006

NOTES:

1. FLASHING RED/RED (CALL-ON) ASPECT PROVIDED FOR ALL REVERSE ROUTES TO ALLEGHENY INTERLOCKING SIGNAL 4N
 2. GRADE SHOWN WITH REFERENCE TO TRAVEL FROM WOOD STREET TO GATEWAY REGARDLESS OF CONTROL LINE DIRECTION
 3. GT TIMING FOR 2NGT BEGINS AT SIGNAL 12S.



THE PREPARATION OF THIS DOCUMENT HAS
BEEN FINANCED IN PART THROUGH A GRANT
FROM THE FEDERAL TRANSIT ADMINISTRATION,
U.S. DEPARTMENT OF TRANSPORTATION, UNDER
THE URBAN MASS TRANSPORTATION ACT OF
1964, AS AMENDED, FOR THE PORT AUTHORITY
OF ALLEGHENY COUNTY, PENNSYLVANIA.

DMJM HARRIS AECON	
FOUR GATEWAY CENTER 20TH FLOOR PITTSBURGH, PA. 15222	
<i>[Signature]</i> David P. Harrington 2/1/08	
APPROVED	DATE

DESIGNED	FW
DRAWN	J
CHECKED	G N
IN CHARGE	CD
DATE	APR 2
SCALE	

PITTSBURGH

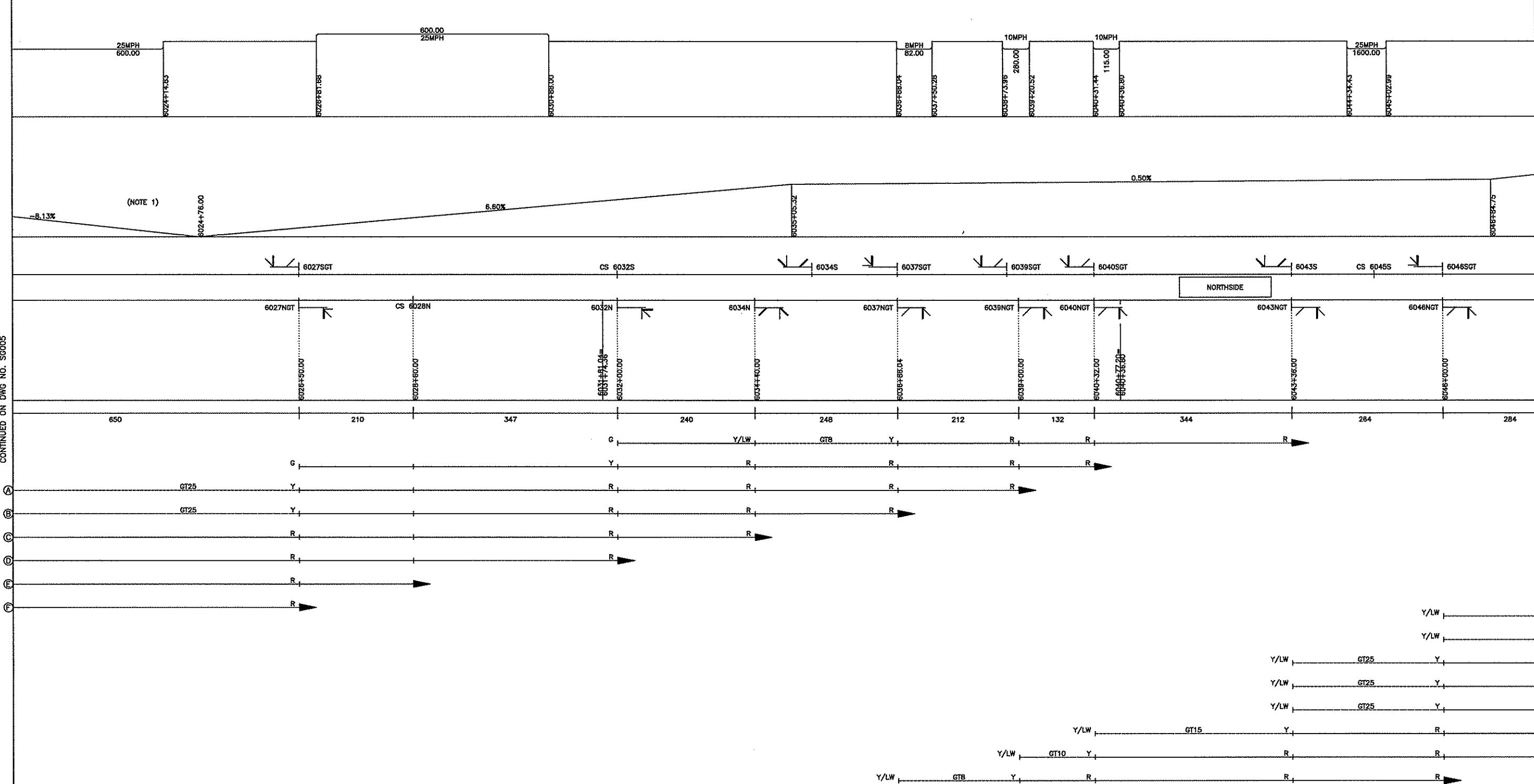
**NORTH SHORE CONNECTOR
NSC TRAIN SYSTEM (SYSTEM WIDE)**

**SIGNAL BLOCK PLAN AND CONTROL LINES (INBOUND)
GATEWAY / WOOD STREET TO ALLEGHENY (1 OF 3)**

 Gannett Fleming
Transit & Rail Systems

SYS
TRA
USA

SYSTRA Consulting, Inc.
Two Whipple Place - Suite
Lebanon, NH 03766-1356



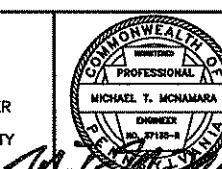
NOTES:

1. GRADE SHOWN WITH REFERENCE TO TRAVEL FROM WOOD STREET TO GATEWAY REGARDLESS OF CONTROL LINE DIRECTION



SYS
TRA SYSTRA Consulting, Inc.
Two Whipple Place - Suite 300
Lebanon, NH 03766-1356

THE PREPARATION OF THIS DOCUMENT HAS
BEEN FINANCED IN PART THROUGH A GRANT
FROM THE FEDERAL TRANSIT ADMINISTRATION,
U.S. DEPARTMENT OF TRANSPORTATION, UNDER
THE URBAN MASS TRANSPORTATION ACT OF
1964, AS AMENDED, FOR THE PORT AUTHORITY
OF ALLEGHENY COUNTY, PENNSYLVANIA.



DMJM HARRIS AECOM
FOUR GATEWAY CENTER
20TH FLOOR
PITTSBURGH, PA. 15222

M DESIGNED
DRAWN
CHECKED
IN CHARGE
DATE **A**
B SCALE

FW LIPF
J TRA
G NAZAR
CD JON
PR 2B, 2

ERT
AUM
ROW
NES
200B

P
F

SPORT
PITTSBURG

AUTH
SH
N
GAL BLO
GATEWAY

ORITY
NORTH S.
SC TRAIN
OCK PLAN
/ WOOD S.

Y OF A
SHORE CO
SYSTEM (N
I AND COM
STREET T
CO

ALLEG
CONNECT
SYSTEM W
NTROL LIN
O ALLEG
NTRACTI

**PITTSBURGH PORT AUTHORITY OF ALLEGHENY COUNTY
PENNSYLVANIA**

**NORTH SHORE CONNECTOR
NSC TRAIN SYSTEM (SYSTEM WIDE)
SIGNAL BLOCK PLAN AND CONTROL LINES (INBOUND)
GATEWAY / WOOD STREET TO ALLEGHENY (2 OF 3)**

GATEWAY

WOODS

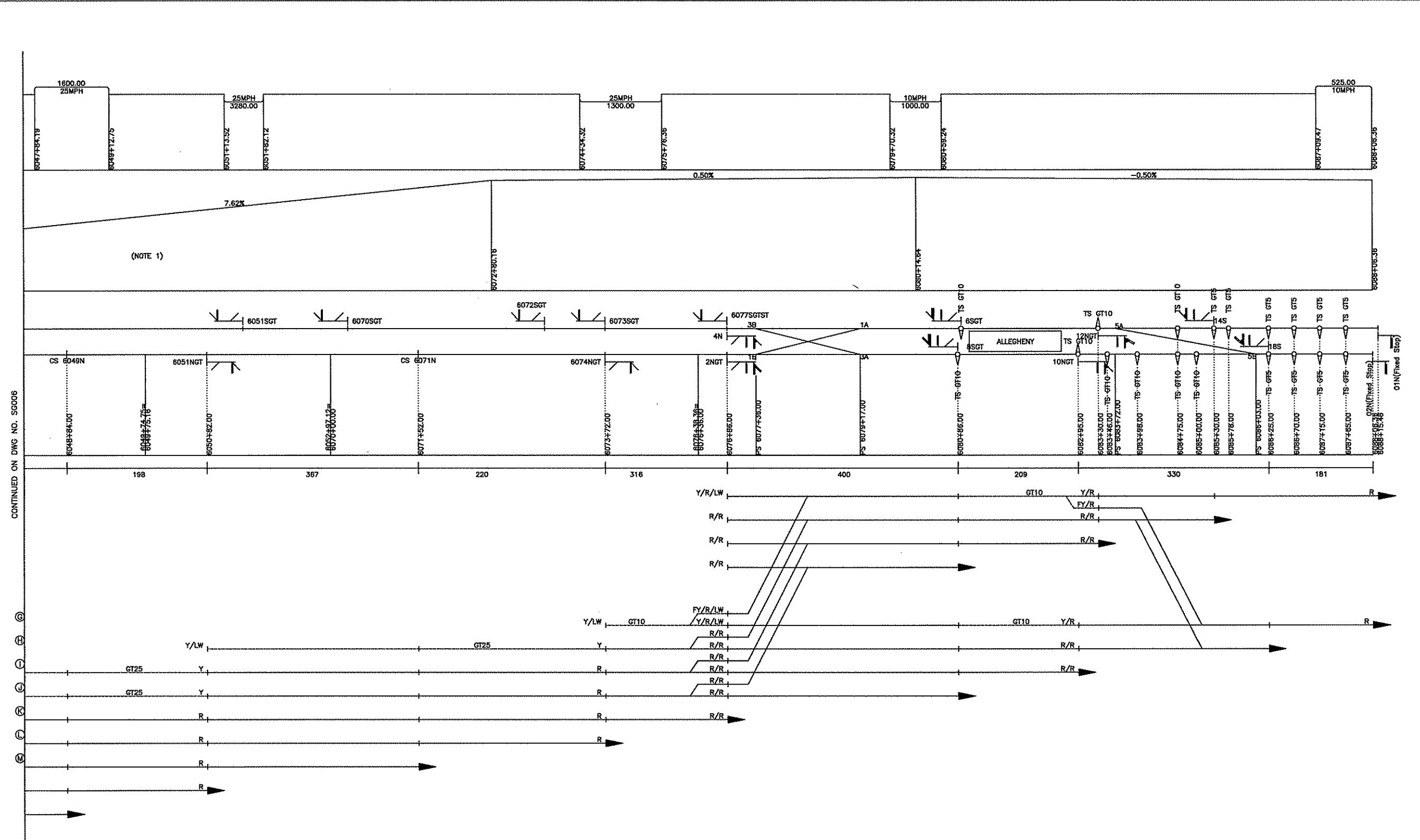
CONT

**ALLEGED
CONTRACT**

HENY (2 C
NO.

NSC

-609

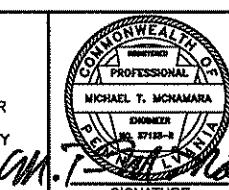


NOTES:

1. GRADE SHOWN WITH REFERENCE TO TRAVEL FROM WOOD STREET TO GATEWAY REGARDLESS OF CONTROL LINE DIRECTION.

 Gannett Fleming Transit & Rail Systems  SYstra Consulting, Inc. Two Whipple Place – Suite 300 Lebanon, NH 03766-1356 USA		
NO.	DATE	DESCRIPTION
		REVISIONS

THE PREPARATION OF THIS DOCUMENT HAS
BEEN FINANCED IN PART THROUGH A GRANT
FROM THE FEDERAL TRANSIT ADMINISTRATION,
U.S. DEPARTMENT OF TRANSPORTATION, UNDER
THE URBAN MASS TRANSPORTATION ACT OF
1964, AS AMENDED, FOR THE PORT AUTHORITY
OF ALLEGHENY COUNTY, PENNSYLVANIA.



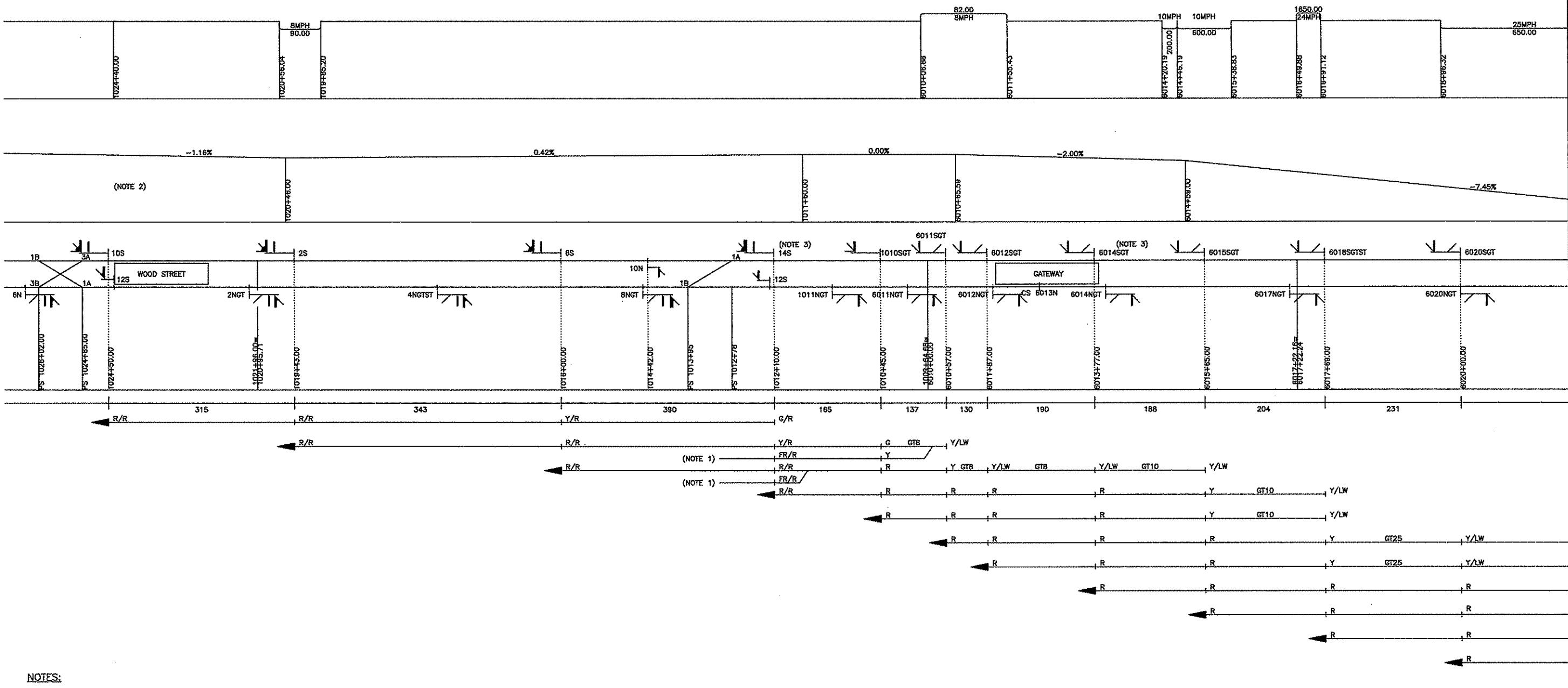
DMJM HARRIS | AECOM
FOUR GATEWAY CENTER
20TH FLOOR
PITTSBURGH, PA 15222
MICHAEAL T. MCNAMARA
ENGINEER
NO. 37122-R
Pittsburgh, PA
APR 28, 2008
Signature: [Signature]

DESIGNED FW LIPFERT
DRAWN J TRAUM
CHECKED G NAZAROW
IN CHARGE CD JONES
DATE APR 28, 2008
APPROVED [Signature] Date: [Signature]
SIGNATURE APPROVED DATE

PORT AUTHORITY OF ALLEGHENY COUNTY
PITTSBURGH
PENNSYLVANIA
NORTH SHORE CONNECTOR
NSC TRAIN SYSTEM (SYSTEM WIDE)
SIGNAL BLOCK PLAN AND CONTROL LINES (INBOUND)
GATEWAY / WOOD STREET TO ALLEGHENY (3 OF 3)

Port Authority	CONTRACT NO.	NSC-009
	DWG. NO.	SG007

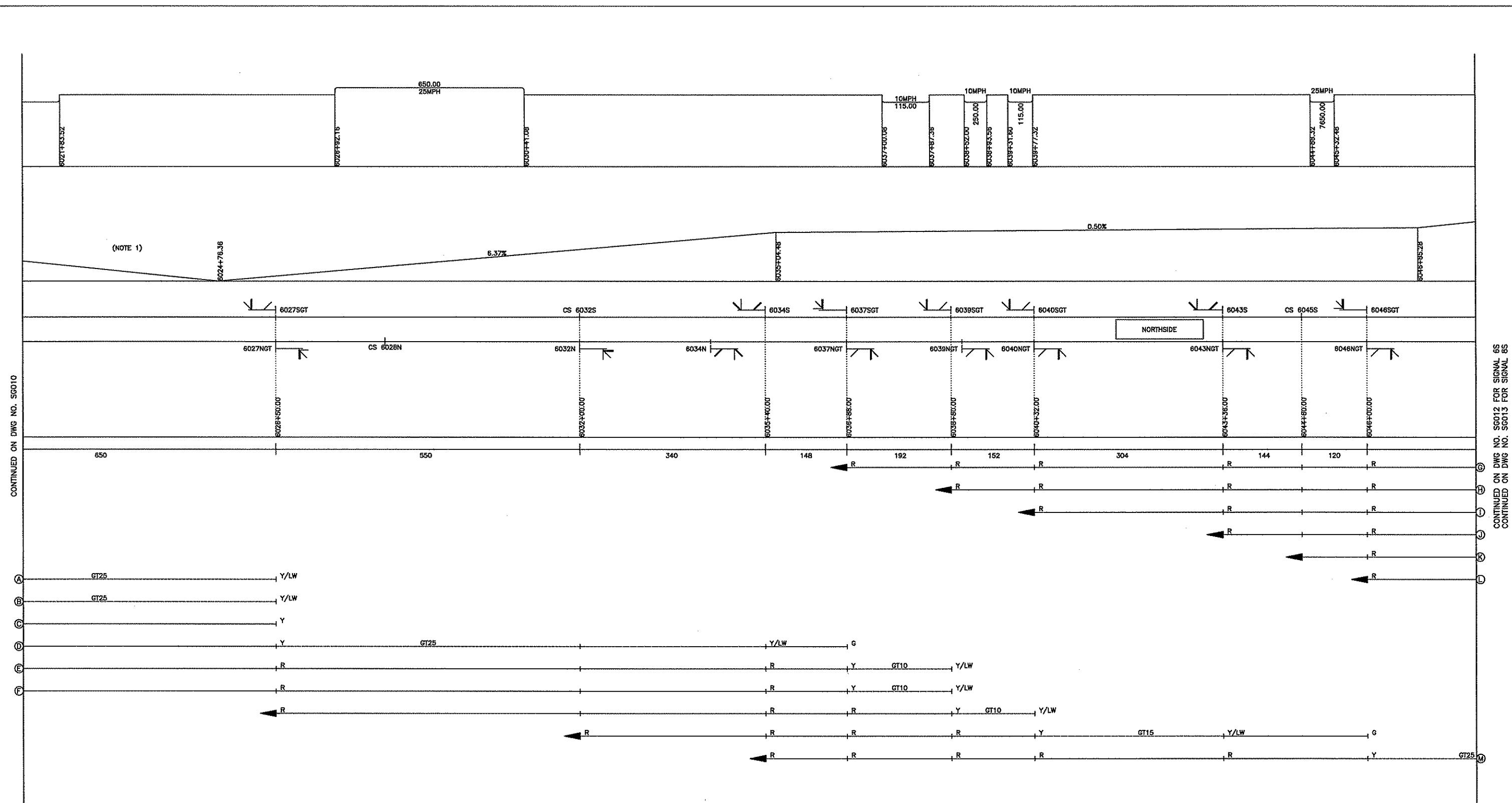
SHT. 339



NOTES:

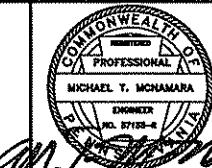
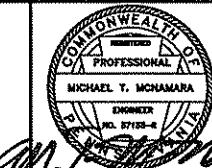
1. FLASHING RED/RED (CALL-ON) ASPECT PROVIDED FOR ALL REVERSE ROUTES TO ALLEGHENY INTERLOCKING SIGNAL 4N.
2. GRADE SHOWN WITH REFERENCE TO TRAVEL FROM WOOD STREET TO GATEWAY REGARDLESS OF CONTROL LINE DIRECTION.
3. WHEN IN AUTOMATIC MODE, SIGNAL 14S TO BE AUTOMATICALLY REQUESTED BY OCCUPANCY OF ANY TRACK CIRCUIT BETWEEN SIGNALS 14S AND 6015SGT. WHEN IN MANUAL MODE, OCCUPANCY OF TRACK CIRCUITS IN BETWEEN SIGNALS 14S AND 6014SGT SHALL LOCK CROSSOVER 1 IN ITS CURRENT POSITION.

<p>THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.</p> <p></p> <p>DMJM HARRIS AECOM FOUR GATEWAY CENTER 20TH FLOOR PITTSBURGH, PA 15222 SIGNATURE: <i>[Signature]</i> APPROVED: <i>[Signature]</i> DATE: <i>April 21, 2008</i></p>				<p>THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.</p> <p></p> <p>DMJM HARRIS AECOM FOUR GATEWAY CENTER 20TH FLOOR PITTSBURGH, PA 15222 SIGNATURE: <i>[Signature]</i> APPROVED: <i>[Signature]</i> DATE: <i>April 21, 2008</i></p>	PORT AUTHORITY OF ALLEGHENY COUNTY PITTSBURGH PENNSYLVANIA NORTH SHORE CONNECTOR NSC TRAIN SYSTEM (SYSTEM WIDE) SIGNAL BLOCK PLAN AND CONTROL LINES (OUTBOUND) ALLEGHENY TO GATEWAY / WOOD STREET (1 OF 4)		
	NO.	DATE	DESCRIPTION		DRAWN	J. TRAUM	
	REVISIONS				CHECKED	G. NAZAROW	
					IN CHARGE	C.D. JONES	
					DATE	APR 28, 2008	
					SCALE	N.T.S.	
					CONTRACT NO.	NSC-009	
					DWG. NO.	SG010	
					SHT.	340	

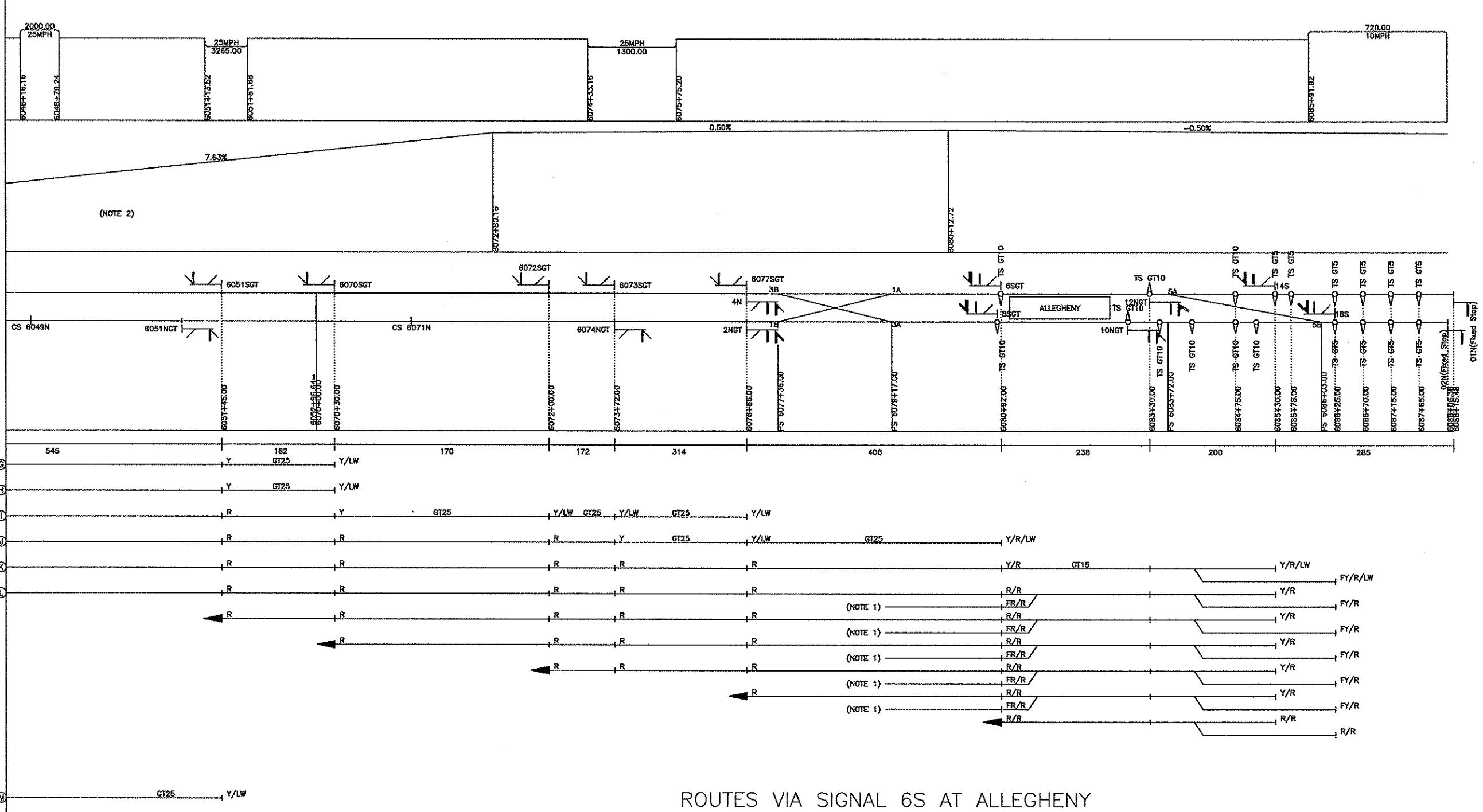


NOTES:

1. GRADE SHOWN WITH REFERENCE TO TRAVEL FROM WOOD STREET TO GATEWAY REGARDLESS OF CONTROL LINE DIRECTION.

Gannett Fleming Transit & Rail Systems  SYSTRA Consulting, Inc. Two Whipple Place - Suite 300 Lebanon, NH 03766-1356			THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.	 DMJM HARRIS AECOM FOUR GATEWAY CENTER 20TH FLOOR PITTSBURGH, PA 15222 ENGINEER: MICHAEL T. MCNAMARA APPROVED: JAMES P. HARRIS DATE: APR 26, 2008 SIGNATURE: 	DESIGNED	FW LIPPERT	PORT AUTHORITY OF ALLEGHENY COUNTY PITTSBURGH PENNSYLVANIA NORTH SHORE CONNECTOR NSC TRAIN SYSTEM (SYSTEM WIDE) SIGNAL BLOCK PLAN AND CONTROL LINES (OUTBOUND) ALLEGHENY TO GATEWAY / WOOD STREET (2 OF 4)
				DRAWN	J TRAUM		
				CHECKED	G NAZAROW		
				IN CHARGE	CD JONES		
				DATE	APR 26, 2008		
				SCALE	N.T.S.		
				Port Authority	CONTRACT NO.	NSC-009	
					DWG. NO.	SG011	
					SHT.	34	

卷之三



ROUTES VIA SIGNAL 6S AT ALLEGHENY

NOTES:

1. FLASHING RED/RED (CALL-ON) ASPECT PROVIDED FOR ALL REVERSE ROUTES TO GATEWAY INTERLOCKING SIGNAL 12S.
 2. GRADE SHOWN WITH REFERENCE TO TRAVEL FROM WOOD STREET TO GATEWAY REGARDLESS OF CONTROL LINE DIRECTION

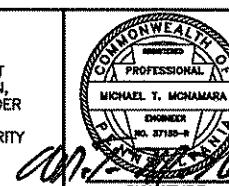


SYS
TRA
USA

SYSTRA Consulting, Inc.
Two Whipple Place - Suite 300
Lebanon, NH 03766-1356

NO.	DATE	DESCRIPTION
		REVISIONS

THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.



DMJM HARRIS | AECON

FOUR GATEWAY CENTER

20TH FLOOR
PITTSBURGH, PA. 15222

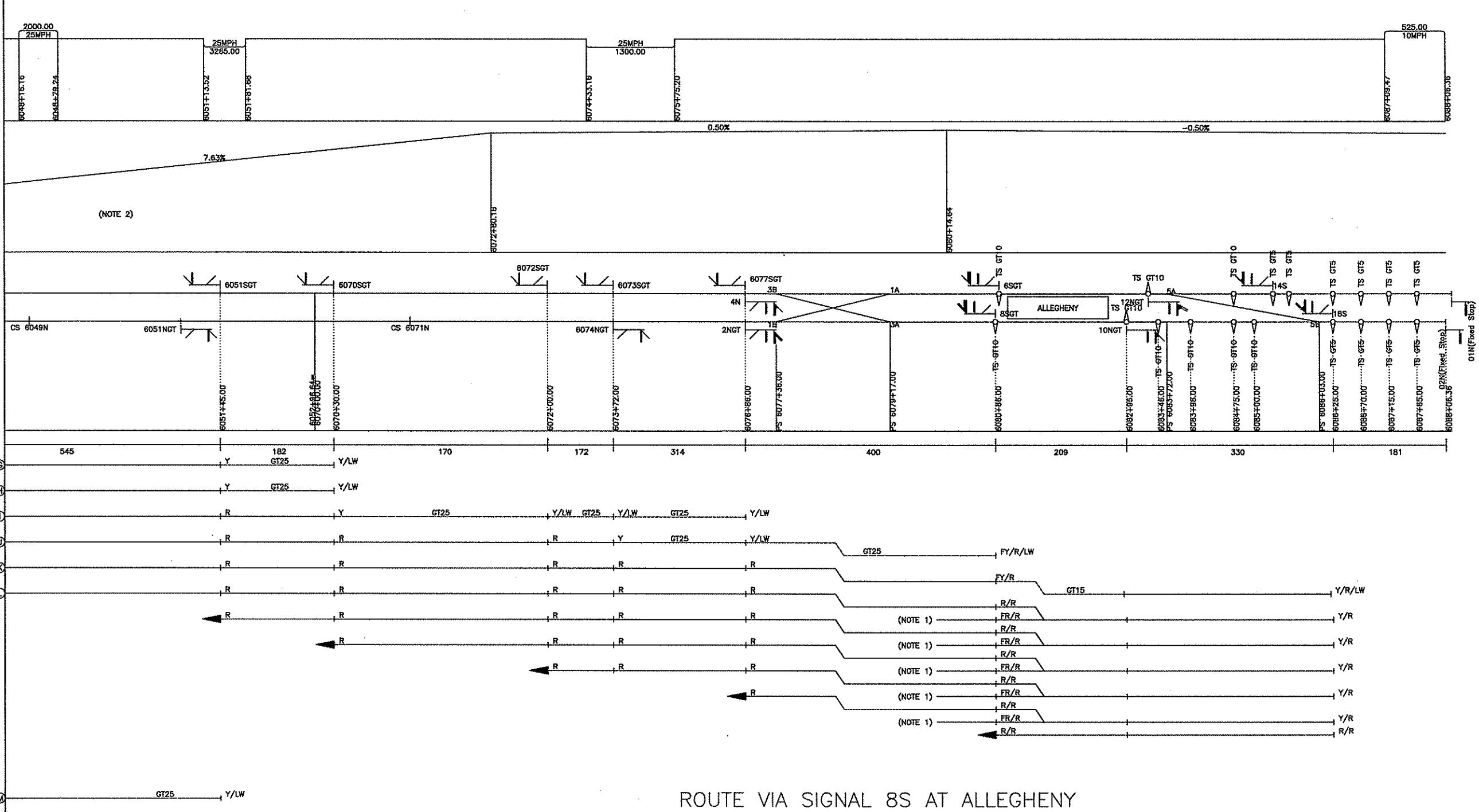
① left side

espar Janet & Henry 2/1/08

DESIGNED	FW LIPFER
DRAWN	J TRAUM
CHECKED	G NAZAROW
IN CHARGE	CD JONES
DATE	APR 28, 2000
SCALE	N.T.S.

PORT AUTHORITY OF ALLEGHENY COUNTY
PITTSBURGH **PENNSYLVANIA**
NORTH SHORE CONNECTOR
NSC TRAIN SYSTEM (SYSTEM WIDE)
SIGNAL BLOCK PLAN AND CONTROL LINES (OUTBOUND)
ALLEGHENY TO GATEWAY / WOOD STREET (3 OF 4)

卷之三



NOTES

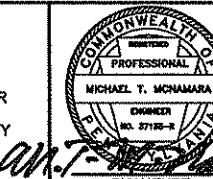
1. FLASHING RED/RED (CALL-ON) ASPECT PROVIDED FOR ALL REVERSE ROUTES TO GATEWAY INTERLOCKING SIGNAL 12S.
 2. GRADE SHOWN WITH REFERENCE TO TRAVEL FROM WOOD STREET TO GATEWAY REGARDLESS OF CONTROL LINE DIRECTION



**SYS
TRA**
SYSTRA Consulting, Inc.
Two Whipple Place - Suite 300
Lebanon, NH 03766-1356

NO.	DATE	DESCRIPTION
		REVISIONS

THE PREPARATION OF THIS DOCUMENT HAS
BEEN FINANCED IN PART THROUGH A GRANT
FROM THE FEDERAL TRANSIT ADMINISTRATION,
U.S. DEPARTMENT OF TRANSPORTATION, UNDER
THE URBAN MASS TRANSPORTATION ACT OF
1964, AS AMENDED, FOR THE PORT AUTHORITY
OF ALLEGHENY COUNTY, PENNSYLVANIA.



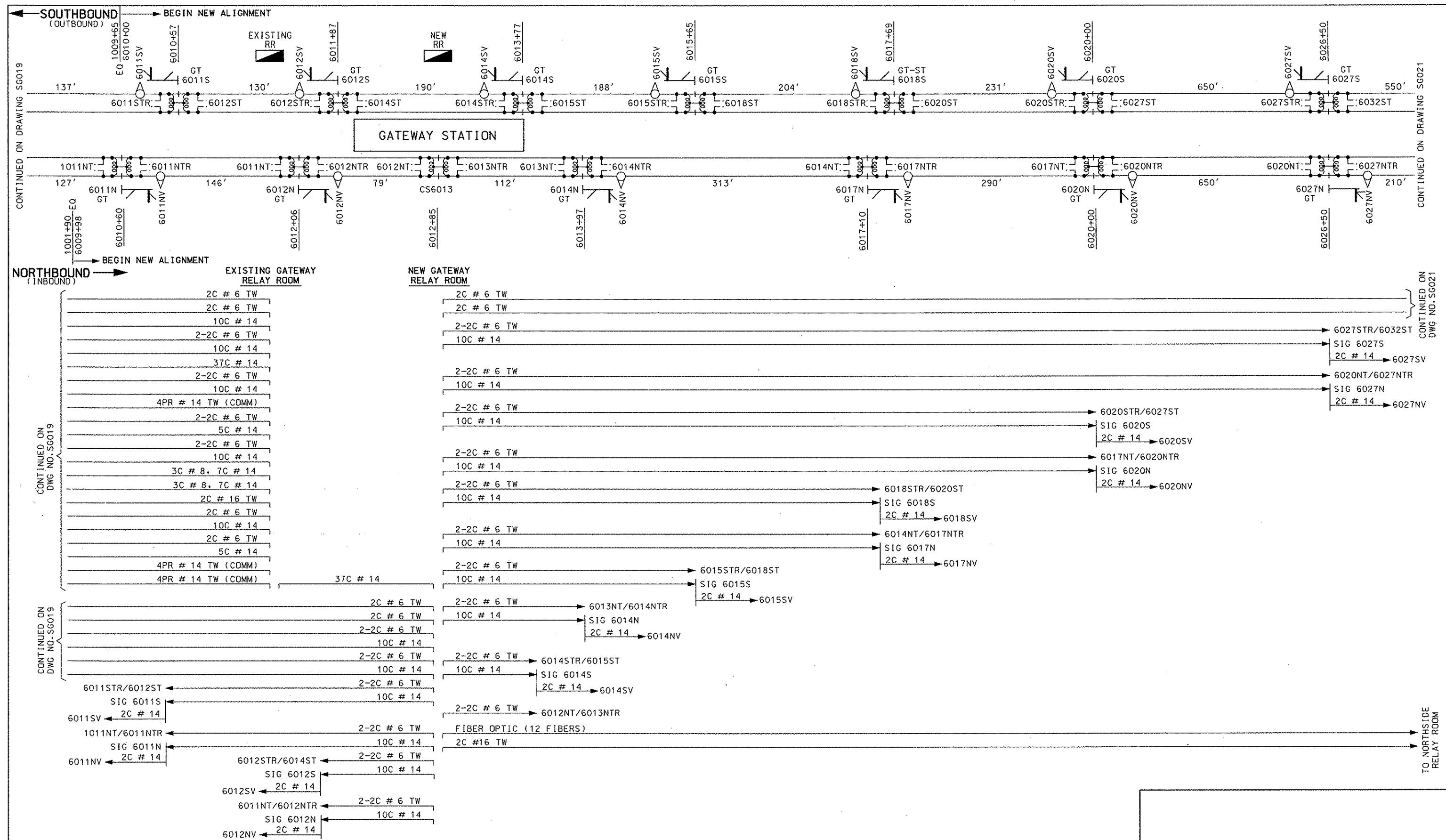
DMJM HARRIS AECO
FOUR GATEWAY CENTER
20TH FLOOR
PITTSBURGH, PA. 15222

DESIGNED	
DRAWN	
CHECKED	
IN CHARGE	
DATE	AM
SCALE	

PORT AUTHORITY OF ALLEGHENY COUNTY	
PITTSBURGH	PENNSYLVANIA
NORTH SHORE CONNECTOR NSC TRAIN SYSTEM (SYSTEM WIDE)	
SIGNAL BLOCK PLAN AND CONTROL LINES (OUTBOUND) ALLEGHENY TO GATEWAY / WOOD STREET (4 OF 4)	
Port Authority <small>Engineering services to the</small>	CONTRACT NO. NSC-009
	DWG. NO. SG013 SHT 3

INBOUND (NORTHBOUND) TIMER SETTINGS, WOOD STREET STATION THROUGH ALLEGHENY STATION AND TO BUMPERS (Full Speed - Full Length Method)											
Timed Signal	Timed Signal Type	Timed Signal Segment	Timed Signal Stationing	Timing Point	Timing Point Segment	Design Speed	Timing Length	Theoretical Timer Relay Setting (A)	Assumed Timer Relay/Trip Stop Deactivation Time (B)	Actual Timer Relay Setting (A-B)	
Identifier	Identifier	Identifier	Feet	Identifier	Identifier	MPH	Feet	Seconds	Seconds	Seconds	
Wood Street Station through 6074NGT (straight route)											
2NGT	GT	R1	1022+00.00	12S	R1	1024+40.00	8	240	20.4	2.0	18.4
4NGT	GT	R2	1017+84.00	2NGT	R1	1022+00.00	15	326	14.5	2.0	12.5
8NGT	GT	R2	1014+42.00	4NGTST	R2	1017+84.00	20	342	11.9	2.0	9.9
1011NGT	GT	R2	1011+28.00	8NGT	R2	1014+42.00	20	314	11.0	2.0	9.0
6011NGT	GT	R4	6010+60.00	1011NGT	R2	1011+28.00	8	127	10.8	2.0	8.8
6012NGT	GT	R4	6012+06.00	6011NGT	R4	6010+60.00	8	146	12.4	2.0	10.4
6014NGT	GT	R4	6013+97.00	6012NGT	R4	6012+06.00	15	191	8.7	2.0	6.7
6017NGT	GT	R4	6017+10.00	6014NGT	R4	6013+97.00	25	313	8.5	2.0	6.5
6020NGT	GT	R4	6020+00.00	6017NGT	R4	6017+10.00	25	290	7.9	2.0	5.9
6027NGT	GT	R4	6026+50.00	6020NGT	R4	6020+00.00	25	650	17.7	2.0	15.7
n/a	R5	6032+00.00	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
6034N	n/a	R5	6034+40.00	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
6037NGT	GT	R5	6036+88.04	6034N	R5	6034+40.00	8	248	21.1	2.0	19.1
6039NGT	GT	R5	6039+00.00	6037NGT	R5	6036+88.04	8	212	18.1	2.0	16.1
6040NGT	GT	R5	6040+32.00	6039NGT	R5	6039+00.00	10	132	9.0	2.0	7.0
6043NGT	GT	R6	6043+36.00	6040NGT	R5	6040+32.00	15	344	15.6	2.0	13.6
6046NGT	GT	R6	6046+00.00	6043NGT	R6	6043+36.00	25	264	7.2	2.0	5.2
6051NGT	GT	R7	6050+82.00	6046NGT	R6	6046+00.00	25	482	13.1	2.0	11.1
6074NGT	GT	R8	6073+72.00	6051NGT	R7	6050+82.00	25	587	16.0	2.0	14.0
6074NGT to Fixed Stop 02N (straight route; switches 1B, 3A, and 5B normal)											
6074NGT	GT	R8	6073+72.00	6051NGT	R7	6050+82.00	25	587	16.0	2.0	14.0
2NGT	GT	R9	6076+86.00	6074NGT	R8	6073+72.00	10	316	21.5	2.0	19.5
8SGT	BTS	R9	6080+86.00	2NGT	R9	6076+86.00	10	400	27.3	2.0	25.3
10NGT	GT	R9	6082+95.00	6SGT	R9	6080+86.00	10	209	14.3	2.0	12.3
BTS 6083+46	BTS	R9	6083+46.00	10NGT	R9	6082+95.00	10	51	3.5	2.0	1.5
BTS 6083+98	BTS	R9	6083+98.00	10NGT	R9	6082+95.00	10	103	7.0	2.0	5.0
BTS 6084+75	BTS	R9	6084+75.00	10NGT	R9	6082+95.00	10	180	12.3	2.0	10.3
BTS 6085+00	BTS	R9	6085+00.00	10NGT	R9	6082+95.00	10	205	14.0	2.0	12.0
18S	BTS	R9	6086+25.00	10NGT	R9	6082+95.00	5	330	45.0	2.0	43.0
BTS 6086+70	BTS	R9	6086+70.00	18S	R9	6086+25.00	5	45	6.1	2.0	4.1
BTS 6087+15	BTS	R9	6087+15.00	18S	R9	6086+25.00	5	90	12.3	2.0	10.3
BTS 6087+65	BTS	R9	6087+65.00	18S	R9	6086+25.00	5	140	19.1	2.0	17.1
Fixed Stop 02N	n/a	R9	6088+06.36	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
6074NGT to Fixed Stop 01N (diverging route; switches 1B and 1A reverse, switch 5A normal)											
6074NGT	GT	R8	6073+72.00	6051NGT	R7	6050+82.00	25	587	16.0	2.0	14.0
2NGT	GT	R9	6076+86.00	6074NGT	R8	6073+72.00	10	316	21.5	2.0	19.5
6SGT	BTS	L1	6080+92.00	2NGT	R9	6076+86.00	10	406	27.7	2.0	25.7
12NGT	GT	L1	6083+30.00	6SGT	L1	6080+92.00	10	238	16.2	2.0	14.2
BTS 6084+75	BTS	L1	6084+75.00	12NGT	L1	6083+30.00	10	145	9.9	2.0	7.9
14S	BTS	L1	6085+30.00	12NGT	L1	6083+30.00	5	200	27.3	2.0	25.3
BTS 6085+78	BTS	L1	6085+78.00	14S	L1	6085+30.00	5	48	6.5	2.0	4.5
BTS 6086+25	BTS	L1	6086+25.00	14S	L1	6085+30.00	5	95	13.0	2.0	11.0
BTS 6086+70	BTS	L1	6086+70.00	14S	L1	6085+30.00	5	140	19.1	2.0	17.1
BTS 6087+15	BTS	L1	6087+15.00	14S	L1	6085+30.00	5	185	25.2	2.0	23.2
BTS 6087+65	BTS	L1	6087+65.00	14S	L1	6085+30.00	5	235	32.0	2.0	30.0
Fixed Stop 01N	n/a	L1	6088+15.48	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
6074NGT to Fixed Stop 02N (diverging route; switches 1B and 1A reverse, switches 5A and 5B reverse)											
6074NGT	GT	R8	6073+72.00	6051NGT	R7	6050+82.00	25	587	16.0	2.0	14.0
2NGT	GT	R9	6076+86.00	6074NGT	R8	6073+72.00	10	316	21.5	2.0	19.5
6SGT	BTS	L1	6080+92.00	2NGT	R9	6076+86.00	10	406	27.7	2.0	25.7
12NGT	GT	L1	6083+30.00	6SGT	L1	6080+92.00	10	238	16.2	2.0	14.2
18S	BTS	R9	6086+25.00	12NGT	L1	6083+30.00	5	299	40.8	2.0	38.8
BTS 6086+70	BTS	R9	6086+70.00	18S	R9	6086+25.00	5	45	6.1	2.0	4.1
BTS 6087+15	BTS	R9	6087+15.00	18S	R9	6086+25.00	5	90	12.3	2.0	10.3
BTS 6087+65	BTS	R9	6087+65.00	18S	R9	6086+25.00	5	140	19.1	2.0	17.1
Fixed Stop 02N	n/a	R9	6088+06.36	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

OUTBOUND (SOUTHBOUND) TIMER SETTINGS, ALLEGHENY STATION TO WOOD STREET STATION (Full Speed - Full Length Method)			
---	--	--	--



THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.



DMJM HARRIS | AECO
FOUR GATEWAY CENTER
20TH FLOOR
PITTSBURGH, PA. 15222

M 8

DESIGN
DRAWN
CHECKED
IN CHARGE
DATE
CALENDAR

ED
ARGE
APR

SM I
H
JF
CD
. 28

NARAI
T TR.
SAME.
JONI
• 20
N

NG
AN
AN
ES
08
TS

卷之三

PO
PITTS

PORT
BURGH

AUT

THOMAS
NSC
UBLE

URITY
NORTH
TRAIN
GATEW
LINE 1

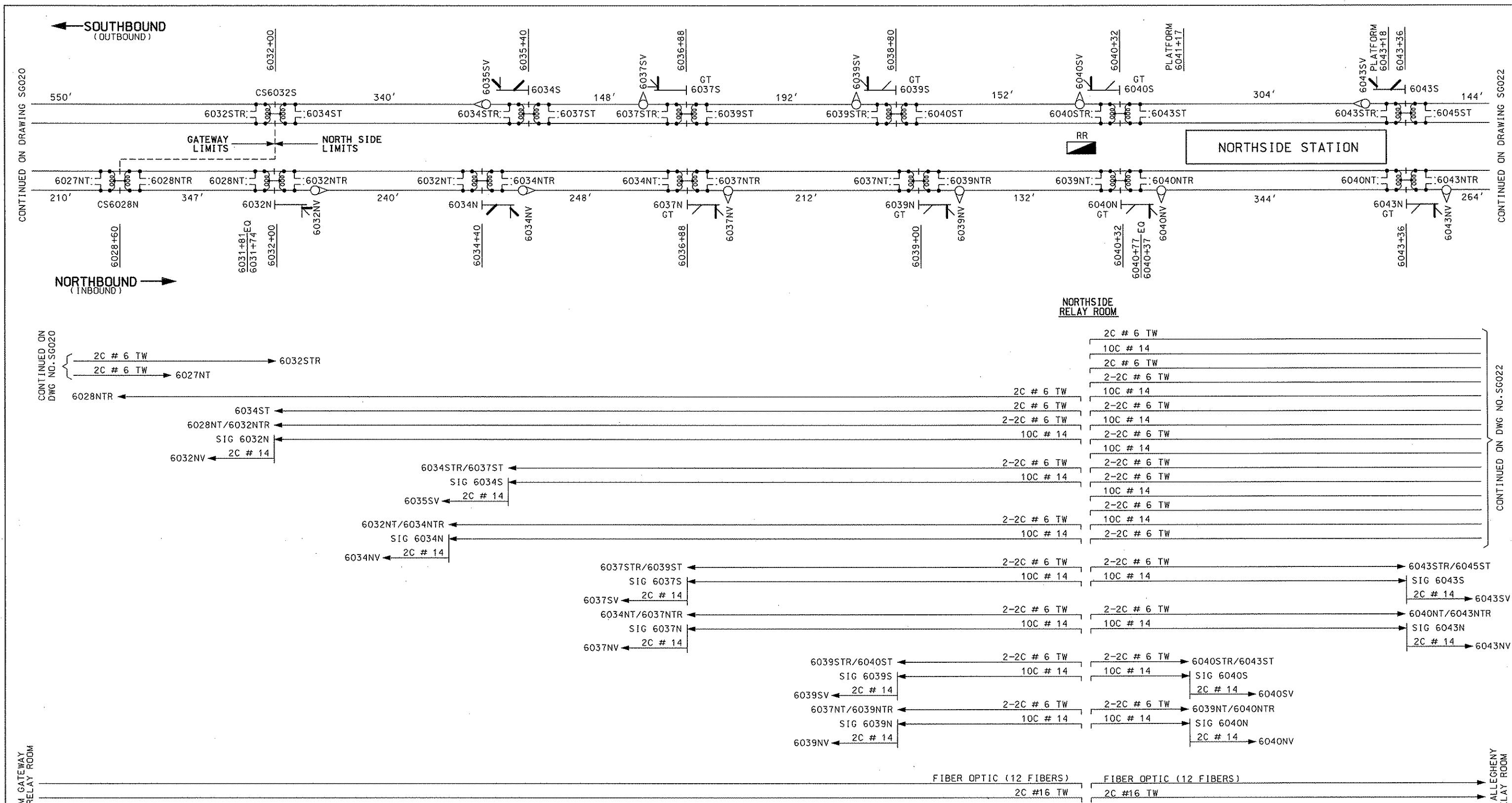
7 OF
H SHO
E SYST
WAY T
TRACK

F ALL

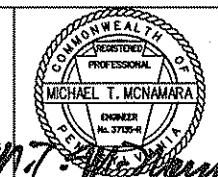
LEG
CONNE
SISTE
LEGHE
IGNAL
TRACT

PORT AUTHORITY OF ALLEGHENY COUNTY
 PITTSBURGH, PENNSYLVANIA

**NORTH SHORE CONNECTOR
 NSC TRAIN SYSTEM (SYSTEM WIDE)
 GATEWAY TO ALLEGHENY
 DOUBLE LINE TRACK & SIGNAL CABLE PLAN**



THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.



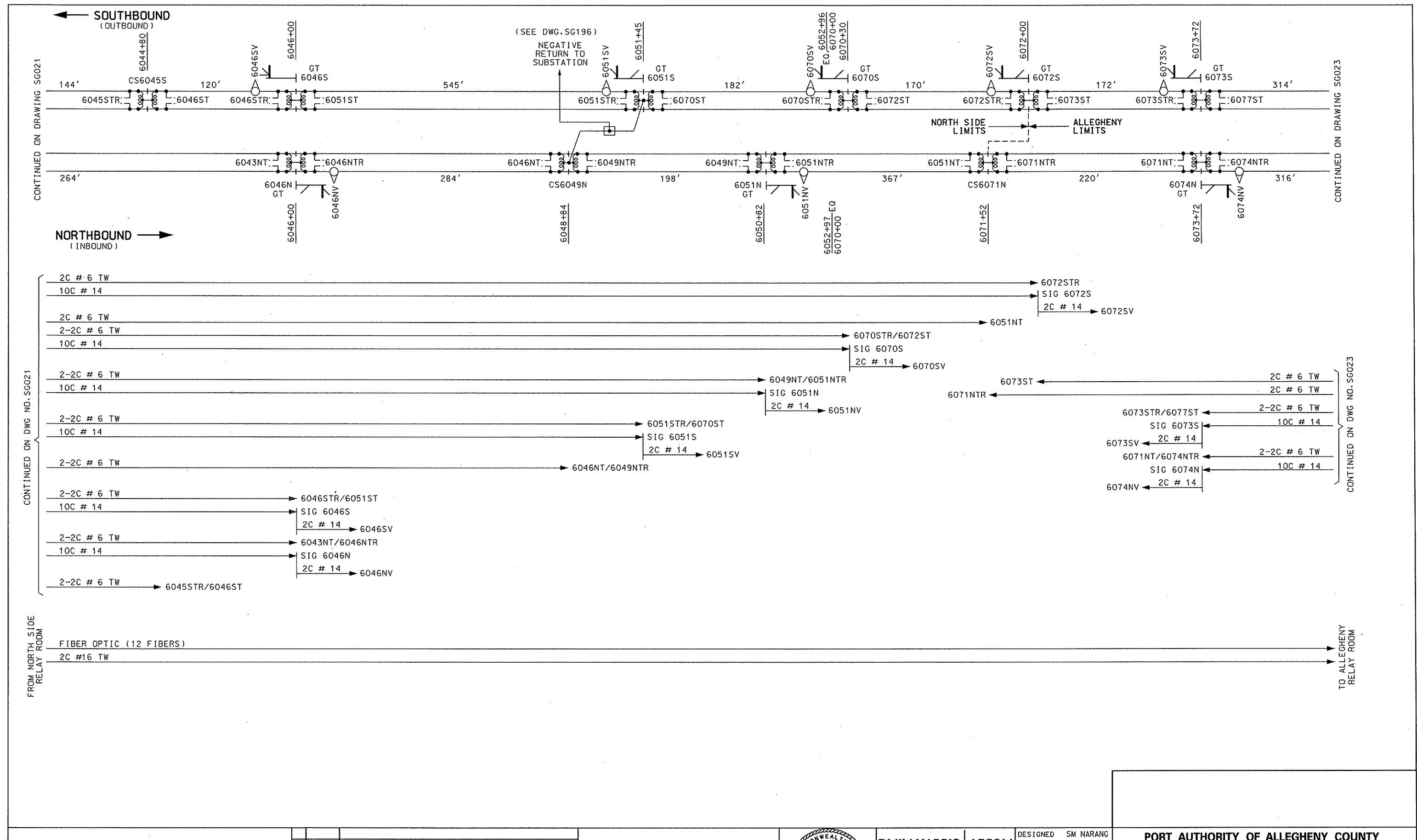
DMJM HARRIS | **AECOM**
FOUR GATEWAY CENTER
20TH FLOOR
PITTSBURGH, PA. 15222
- Daniel P. Harrington 4/28/08
APPROVED DATE

PITTSBURGH

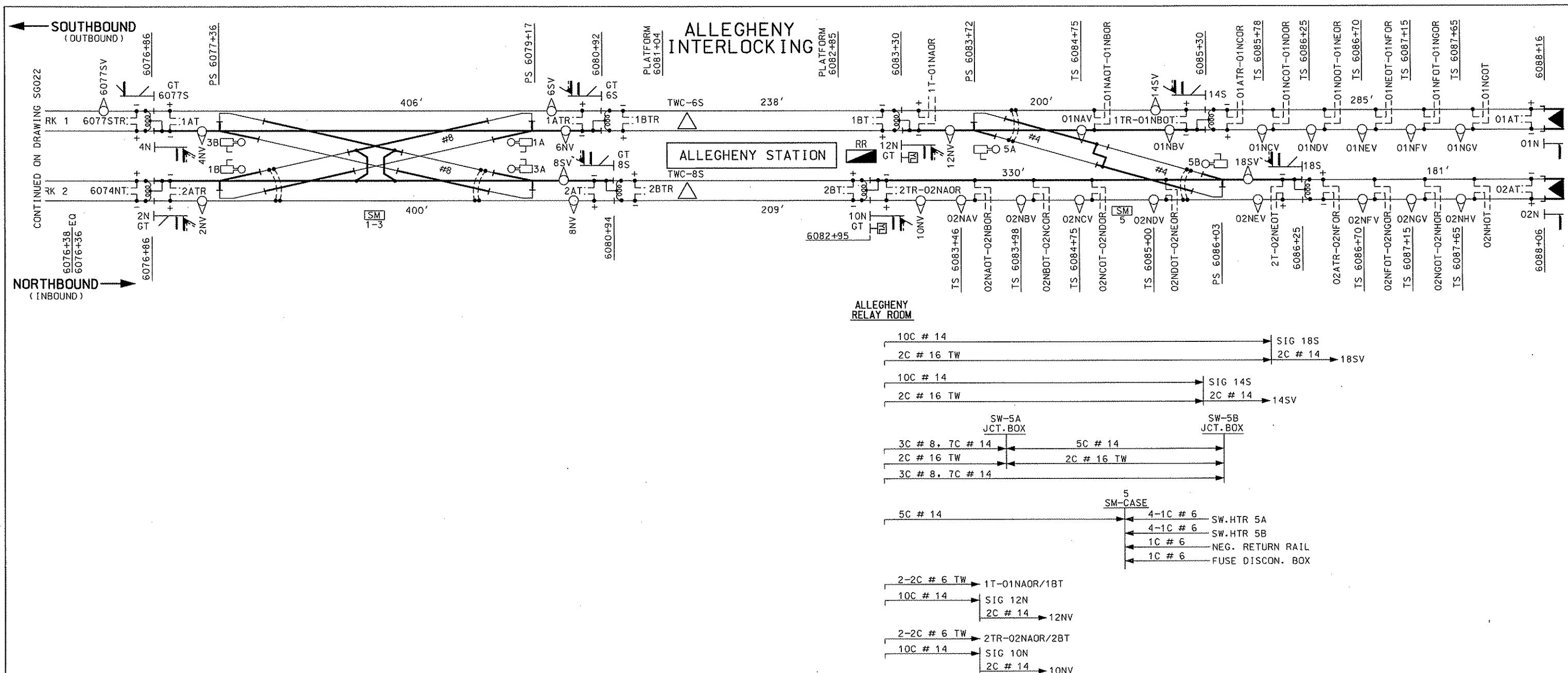
PENNSYLVANIA

**NORTH SHORE CONNECTOR
C TRAIN SYSTEM (SYSTEM WIDE)
GATEWAY TO ALLEGHENY
E LINE TRACK & SIGNAL CABLE PLAN**

Port Authority <small>State-of-the-art port facilities</small>	CONTRACT NO.	NSC-009	
	DWG. NO.	SG021	SHT. 347

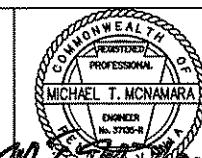


Gannett Fleming Transit & Rail Systems							DESIGNED BY SM NARANG	PORT AUTHORITY OF ALLEGHENY COUNTY	
							DRAWN BY HT TRAN	PITTSBURGH	PENNSYLVANIA
							CHECKED BY JF SAMEAN	NORTH SHORE CONNECTOR	
							IN CHARGE BY CD JONES	NSC TRAIN SYSTEM (SYSTEM WIDE)	
							DATE APR. 28, 2008	GATEWAY TO ALLEGHENY	
							SCALE NTS	DOUBLE LINE TRACK & SIGNAL CABLE PLAN	
NO. DATE	DESCRIPTION	REVISIONS			DMJM HARRIS AECOM	SIGNATURE	APPROVED	DATE	Port Authority
									CONTRACT NO. NSC-009
									DWG. NO. SG022 SHT. 348



 Gannett Fleming
Transit & Rail Systems

THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.



DMJM HARRIS AECOM
FOUR GATEWAY CENTER
20TH FLOOR
PITTSBURGH, PA. 15222
Daniel P. Harrington 4/28/08
APPROVED DATE

DESIGNED	SM NARAN
DRAWN	HT TRA
CHECKED	JF SAMEA
IN CHARGE	CD JONE
DATE	APR. 28, 200
SCALE	NT

PITTSBURGH

PENNSYLVANIA

NORTH SHORE CONNECTOR
NSC TRAIN SYSTEM (SYSTEM WIDE)
GATEWAY TO ALLEGHENY
DOUBLE LINE TRACK & SIGNAL CABLE PLAN

ALLEGHENY ROUTE & LOCKING CHART

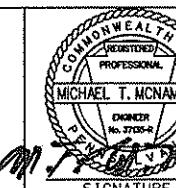
ENTRANCE SIGNAL	EXIT SIGNAL SIGNAL	SWITCH POSITION LOCKED		ASPECT	WHEN ADVANCE SIGNAL ROUTE REQUESTD, SET & LOCKED	TRACKS UNOCCUPIED	APPROACH CLEAR TRACKS GT/ST	APPROACH LOCKING TRACKS	OPPOSING ROUTE LOCKER ENERGIZED	A S RELEASED WHEN 2 TRACKS OCCUPIED	ROUTE LOCKING TRACK CIRCUITS	TRAFFIC LOCKED-ENERGIZED	TRIP STOP ENERGIZED	FLEETING	AUTO ROUTING	PREVENT			
		ROUTE	OVERLAP												TWC OR APPROACH TRK OCCUPANCY REQUEST	LOCAL SIGNAL CLEARING	ADJACENT LOCATION SIGNAL CLEARING		
2N	8S	1N,3N	—	FR/R (W/COZ)	—	—	6074NT (GT = 10MPH) NOTE 1	6074NT, 6071NT, 6051NT, 6049NT, 6046NT, 6043NT	2ASS,2BSS	2AT,2BT	2AT	—	2NV	NO	—	8S	(18S W/5N)		
		1N,3N	5N	Y/R/L	10N-18S	2AT,2BT, 2T,02AT			2ASS,2BSS, 2SS						6043NT, 6046NT, 6049NT, 6051NT, 6071NT, 6074NT		18S		
	6S	1R,3N	—	FR/R (W/COZ)	—	—	6074NT (GT = 10MPH) NOTE 1	6074NT, 6071NT, 6051NT, 6049NT, 6046NT, 6043NT	2ASS,1BSS	2AT,1AT	2AT,1AT	—	2NV	NO	—	6S	(18S W/5R)		
		1R,3N	5N	FY/R/L	12N-14S	2AT,1AT,1BT 1T(01AT W/5N) (2T,02AT W/5R)			2ASS,1BSS, 1ASS,1SS, (2SS W/5R)						6043NT, 6046NT, 6049NT, 6051NT, 6071NT, 6074NT				
		5R	—		12N-18S	—			1ASS,1BSS						—				
	4N	1N,3N	—	FR/R (W/COZ)	—	—	TIME LOCKING	TIME LOCKING	1ASS,1BSS,1SS, (2SS W/5R)	1AT,1BT	1AT	—	4NV	NO	—	6S	(18S W/5R)		
		5N	—	Y/R/L	12N-14S	1AT,1BT,1T (01AT W/5N)			1ASS,1BSS,1SS, (2SS W/5R)						—				
		5R	—		12N-18S	(2T,02AT W/5R)			1ASS,2BSS						—				
10N	18S	5N	—	FR/R (W/COZ)	—	—	2BT (GT = 10MPH) NOTE 1	TIME LOCKING	2SS	2T,02AT	2T	—	10NV	NO	—	18S	—		
				Y/R	—	—									—				
12N	14S	5N	—	FR/R (W/COZ)	—	—	1BT (GT = 10MPH) NOTE 1	TIME LOCKING	1SS	1T,01AT	1T	—	12NV	NO	—	14S	—		
				Y/R	—	1T,01AT									—				
	18S	5R	—	FR/R (W/COZ)	—	—	1BT (GT = 10MPH) NOTE 1	TIME LOCKING	1SS,2SS	1T,2T	1T,2T	—	12NV	NO	—	18S	—		
				FY/R	—	1T,2T,02AT									—				
6S	4N	3N,1N	—	FR/R (W/COZ)	—	—	AUTO 6077S-R	1AT,6077ST, 6073ST,6072ST, 6070ST,6051ST, 6046ST	1BT (GT = 15MPH) NOTE 2	TIME LOCKING	1ANS	1AT,6077ST	1AT	1SF	6SV	NO	TWC 6S-4N	4N	GW1ON GW(8N W/1R)
				Y/R	—	—									—				
	4N	3N,1N	—	Y/R/L	AUTO 6077S-R	1AT,6077ST, 6073ST,6072ST, 6070ST,6051ST, 6046ST,6045ST	1BT (GT = 15MPH) NOTE 2	TIME LOCKING	1ANS	1AT,6077ST	1AT	1SF	6SV	NO	TWC 6S-4N	4N	GW1ON GW(8N W/1R)		
	2N	1R,3N	—	FR/R	—	—	—	TIME LOCKING	1ANS,2ANS	1AT,2AT	1AT,2AT	2SF	6SV	NO	—	2N	GW(8N W/1N)		
	2N	3N,1N	—	FR/R	—	—	—	TIME LOCKING	2ANS	2AT,6074NT	2AT	2SF	8SV	NO	—	2N	GW(8N W/1N)		
8S	4N	3R,1N	—	FR/R (W/COZ)	—	—	AUTO 6077S-R	2AT,1AT 6077ST,6073ST, 6072ST,6070ST, 6051ST,6046ST	2BT (GT = 15MPH) NOTE 2	TIME LOCKING	2ANS,1ANS	2AT,1AT	2AT,1AT	1SF	8SV	NO	TWC 8S-4N	4N	GW1ON GW(8N W/1R)
				FY/R	—	—									—				
	4N	3R,1N	—	FY/R/L	AUTO 6077S-R	2AT,1AT 6077ST,6073ST, 6072ST,6070ST, 6051ST,6046ST, 6045ST	2BT (GT = 15MPH) NOTE 2	TIME LOCKING	2ANS,1ANS	2AT,1AT	2AT,1AT	1SF	8SV	NO	TWC 8S-4N	4N	GW1ON GW(8N W/1R)		

(CONTINUED ON DWG NO. SG036)

NOTES:

1. GT ENFORCES 10 MPH SPEED THROUGH INTERLOCKING.
2. GT ENFORCES 15 MPH SPEED THROUGH INTERLOCKING.
3. NORMAL TURNBACK OPERATIONS TO UTILIZE CROSSOVER 1 AND 3.
4. YARD LIMIT SIGNS TO BE INSTALLED AT SIGNALS 10N AND 12N.

THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.



MICHAEL T. McNAMARA
CHIEF ENGINEER
DMJM HARRIS | AECOM

FOUR GATEWAY CENTER
20TH FLOOR
PITTSBURGH, PA. 15222

APPROVED
DATE

DESIGNED SM NARANG
DRAWN HT TRAN
CHECKED JF SAMEAN
IN CHARGE CD JONES
DATE APR. 28, 2008
SCALE NTS

PORT AUTHORITY OF ALLEGHENY COUNTY
PITTSBURGH
NORTH SHORE CONNECTOR
NSC TRAIN SYSTEM (SYSTEM WIDE)
ALLEGHENY INTERLOCKING
ROUTE & LOCKING CHART
Port Authority
CONTRACT NO. NSC-009
DWG. NO. SG035
SHT. 351

Gannett Fleming
Transit & Rail Systems

NO. DATE	DESCRIPTION
REVISIONS	

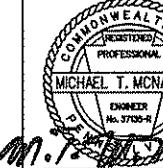
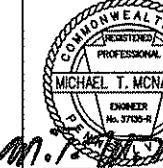
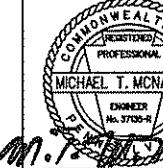
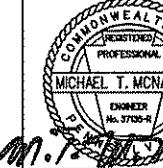
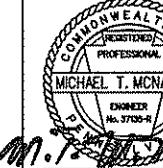
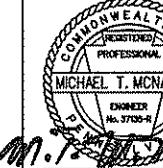
ALLEGHENY ROUTE & LOCKING CHART

ENTRANCE SIGNAL	EXIT SIGNAL SIGNAL	SWITCH POSITION LOCKED		ASPECT	WHEN ADVANCE SIGNAL ROUTE REQUESTD. SET & LOCKED	TRACKS UNOCCUPIED	APPROACH CLEAR TRACKS GT/ST	APPROACH LOCKING TRACKS	OPPOSING ROUTE LOCKER ENERGIZED	A S RELEASED WHEN 2 TRACKS OCCUPIED	ROUTE LOCKING TRACK CIRCUITS	TRAFFIC LOCKED-ENERGIZED	TRIP STOP ENERGIZED	FLEETING	AUTO ROUTING	PREVENT	
		ROUTE	OVERLAP												TWC OR APPROACH TRK OCCUPANCY REQUEST	LOCAL SIGNAL CLEARING	ADJACENT LOCATION SIGNAL CLEARING
14S	12N	5N	—	FR/R (W/COZ)	—	—	—	TIME LOCKING	1NS,1BNS	1T,1BT	1T	—	14SV	NO	—	12N	(4N W/3N) (2N W/1R)
	12N	5N	1N,3N	Y/R	6S-4N	1T,1BT,1AT	—	TIME LOCKING	1NS,1BNS,1ANS	1T,1BT	1T	1SF	14SV	NO	—	12N	4N
	12N	5N	1N,3N	Y/R	6S-4N	1T,1BT,1AT, 6077ST	—	TIME LOCKING	1NS,1BNS,1ANS	1T,1BT	1T	1SF	14SV	NO	—	12N	4N
	12N	5N	1N,3N	Y/R	6S-4N	1T,1BT,1AT, 6077ST,6073ST	—	TIME LOCKING	1NS,1BNS,1ANS	1T,1BT	1T	1SF	14SV	NO	—	12N	4N
	12N	5N	1N,3N	Y/R	6S-4N	1T,1BT,1AT, 6077ST,6073ST, 6072ST	—	TIME LOCKING	1NS,1BNS,1ANS	1T,1BT	1T	1SF	14SV	NO	—	12N	4N
	12N	5N	1N,3N	Y/R	6S-4N	1T,1BT,1AT, 6077ST,6073ST, 6072ST,6070ST	—	TIME LOCKING	1NS,1BNS,1ANS	1T,1BT	1T	1SF	14SV	NO	—	12N	4N
	12N	5N	1N,3N	Y/R	6S-4N	1T,1BT,1AT, 6077ST,6073ST, 6072ST,6070ST, 6051ST	—	TIME LOCKING	1NS,1BNS,1ANS	1T,1BT	1T	1SF	14SV	NO	—	12N	4N
	12N	5N	1N,3N	Y/R/L	6S-4N	1T,1BT,1AT, 6077ST,6073ST, 6072ST,6070ST, 6051ST,6046ST	—	TIME LOCKING	1NS,1BNS,1ANS	1T,1BT	1T	1SF	14SV	NO	—	12N	4N
18S	10N	5N	—	FR/R (W/COZ)	—	—	—	TIME LOCKING	2NS,2BNS	2T,2BT	2T	—	18SV	NO	—	10N	(2N W/1N) (4N W/3R)
	10N	5N	3R,1N	Y/R	8S-4N	2T,2BT,2AT	—	TIME LOCKING	2NS,2ANS,2BNS 1ANS	2T,2BT	2T	1SF	18SV	NO	—	10N	4N
	10N	5N	3R,1N	Y/R	8S-4N	2T,2BT,2AT 6077ST	—	TIME LOCKING	2NS,2ANS,2BNS 1ANS	2T,2BT	2T	1SF	18SV	NO	—	10N	4N
	10N	5N	3R,1N	Y/R	8S-4N	2T,2BT,2AT 6077ST,6073ST	—	TIME LOCKING	2NS,2ANS,2BNS 1ANS	2T,2BT	2T	1SF	18SV	NO	—	10N	4N
	10N	5N	3R,1N	Y/R	8S-4N	2T,2BT,2AT 6077ST,6073ST, 6072ST	—	TIME LOCKING	2NS,2ANS,2BNS 1ANS	2T,2BT	2T	1SF	18SV	NO	—	10N	4N

(CONTINUED ON DWG NO. SG037)

NOTES:

1. GT ENFORCES 10 MPH SPEED THROUGH INTERLOCKING.
2. GT ENFORCES 15 MPH SPEED THROUGH INTERLOCKING.
3. NORMAL TURNBACK OPERATIONS TO UTILIZE CROSSOVER 1 AND 3.
4. YARD LIMIT SIGNS TO BE INSTALLED AT SIGNALS 10N AND 12N.

	NO. DATE DESCRIPTION REVISIONS	<small>THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.</small>		DESIGNED SM NARANG	PORT AUTHORITY OF ALLEGHENY COUNTY	
				DRAWN HT TRAN	PITTSBURGH	
		CHECKED JF SAMEAN	<small>NORTH SHORE CONNECTOR NSC TRAIN SYSTEM (SYSTEM WIDE) ALLEGHENY INTERLOCKING ROUTE & LOCKING CHART</small>			
		IN CHARGE CD JONES				
		DATE APR. 28, 2008				
		SCALE NTS				
		Port Authority <small>Contract No. NSC-009</small> <small>Dwg. No. SG036</small> <small>Sht. 352</small>				

ALLEGHENY ROUTE & LOCKING CHART

ENTRANCE SIGNAL	EXIT SIGNAL SIGNAL	SWITCH POSITION LOCKED		ASPECT	WHEN ADVANCE SIGNAL ROUTE REQUESTD, SET & LOCKED	TRACKS UNOCCUPIED	APPROACH CLEAR TRACKS GT/ST	APPROACH LOCKING TRACKS	OPPOSING ROUTE LOCKER ENERGIZED	A S RELEASED WHEN 2 TRACKS OCCUPIED	ROUTE LOCKING TRACK CIRCUITS	TRAFFIC LOCKED-ENERGIZED	TRIP STOP ENERGIZED	FLEETING	AUTO ROUTING	PREVENT	
		ROUTE	OVERLAP												TWC OR APPROACH TRK OCCUPANCY REQUEST	LOCAL SIGNAL CLEARING	ADJACENT LOCATION SIGNAL CLEARING
18S	10N	5N	3R,1N	Y/R	8S-4N	2T,2BT,2AT 6077ST,6073ST, 6072ST,6070ST	—	TIME LOCKING	2NS,2ANS,2BNS 1ANS	2T,2BT	2T	1SF	18SV	NO	—	10N	4N
	10N	5N	3R,1N	Y/R	8S-4N	2T,2BT,2AT 6077ST,6073ST, 6072ST,6070ST, 6051ST	—	TIME LOCKING	2NS,2ANS,2BNS 1ANS	2T,2BT	2T	1SF	18SV	NO	—	10N	4N
	10N	5N	3R,1N	Y/R/L	8S-4N	2T,2BT,2AT 6077ST,6073ST, 6072ST,6070ST, 6051ST,6046ST	—	TIME LOCKING	2NS,2ANS,2BNS 1ANS	2T,2BT	2T	1SF	18SV	NO	—	10N	4N
	12N	5R	—	FR/R (W/COZ)	—	—	—	TIME LOCKING	2NS,1NS,1BNS	2T,1T	2T,1T	—	18SV	NO	—	12N	(4N W/3N) (2N W/1R)
	12N	5R	1N,3N	FY/R	6S-4N	1T,2T,1AT,1BT	—	TIME LOCKING	2NS,1NS,1BNS	2T,1T	2T,1T	1SF	18SV	NO	—	12N	4N
	12N	5R	1N,3N	FY/R	6S-4N	1T,2T,1AT,1BT, 6077ST	—	TIME LOCKING	2NS,1NS,1BNS	2T,1T	2T,1T	1SF	18SV	NO	—	12N	4N
	12N	5R	1N,3N	FY/R	6S-4N	1T,2T,1AT,1BT, 6077ST,6073ST	—	TIME LOCKING	2NS,1NS,1BNS	2T,1T	2T,1T	1SF	18SV	NO	—	12N	4N
	12N	5R	1N,3N	FY/R	6S-4N	1T,2T,1AT,1BT, 6077ST,6073ST, 6072ST	—	TIME LOCKING	2NS,1NS,1BNS	2T,1T	2T,1T	1SF	18SV	NO	—	12N	4N
	12N	5R	1N,3N	FY/R	6S-4N	1T,2T,1AT,1BT, 6077ST,6073ST, 6072ST,6070ST	—	TIME LOCKING	2NS,1NS,1BNS	2T,1T	2T,1T	1SF	18SV	NO	—	12N	4N
	12N	5R	1N,3N	FY/R	6S-4N	1T,2T,1AT,1BT, 6077ST,6073ST, 6072ST,6070ST, 6051ST	—	TIME LOCKING	2NS,1NS,1BNS	2T,1T	2T,1T	1SF	18SV	NO	—	12N	4N
	12N	5R	1N,3N	FY/R/L	6S-4N	1T,2T,1AT,1BT, 6077ST,6073ST, 6072ST,6070ST, 6051ST,6046ST	—	TIME LOCKING	2NS,1NS,1BNS	2T,1T	2T,1T	1SF	18SV	NO	—	12N	4N

NOTES:

1. GT ENFORCES 10 MPH SPEED THROUGH INTERLOCKING.
 2. GT ENFORCES 15 MPH SPEED THROUGH INTERLOCKING.
 3. NORMAL TURNBACK OPERATIONS TO UTILIZE CROSSOVER 1 AND 3
 4. YARD LIMIT SIGNS TO BE INSTALLED AT SIGNALS 10N AND 12N



THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.

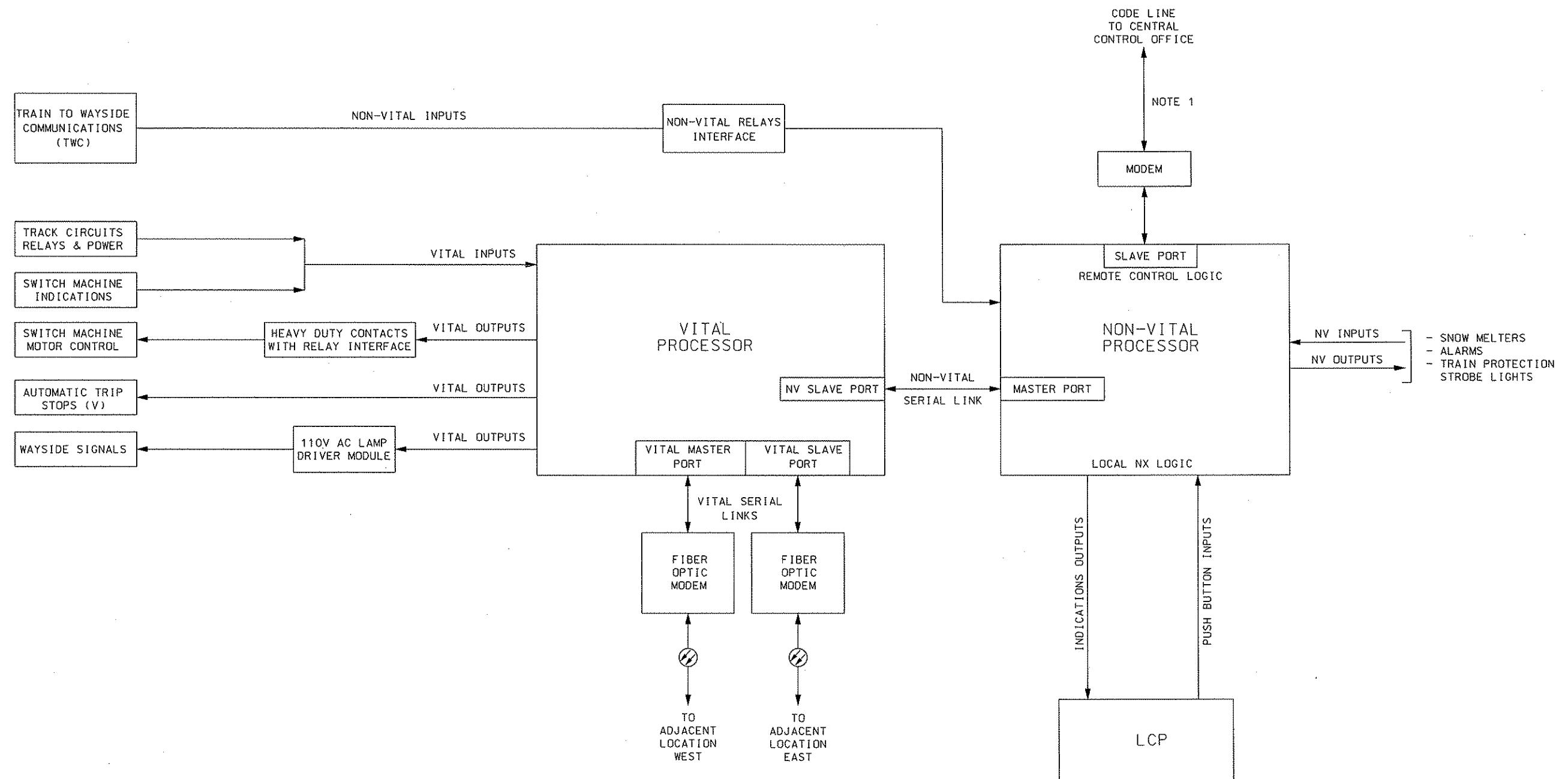
THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.

DMJM HARRIS | AECO
FOUR GATEWAY CENTER
20TH FLOOR
PITTSBURGH, PA. 15222
Daniel J. Harrington 4/28/01

DESIGNED	SM NARANG
DRAWN	HT TRAN
CHECKED	JF SAMEAN
IN CHARGE	CD JONES
DATE	APR. 28, 2008
SCALE	NTS

PORT AUTHORITY OF ALLEGHENY COUNTY
 PITTSBURGH PENNSYLVANIA

**NORTH SHORE CONNECTOR
 NSC TRAIN SYSTEM (SYSTEM WIDE)
 ALLEGHENY INTERLOCKING
 ROUTE & LOCKING CHART**

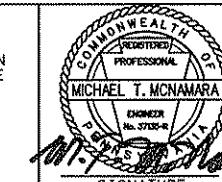


NOTE :

1. REFER TO DRAWINGS CM005, CM011, CM012, CM013 & CM042 FOR INTERFACE OF CODE LINE WITH THE OPERATIONS CONTROL CENTER.



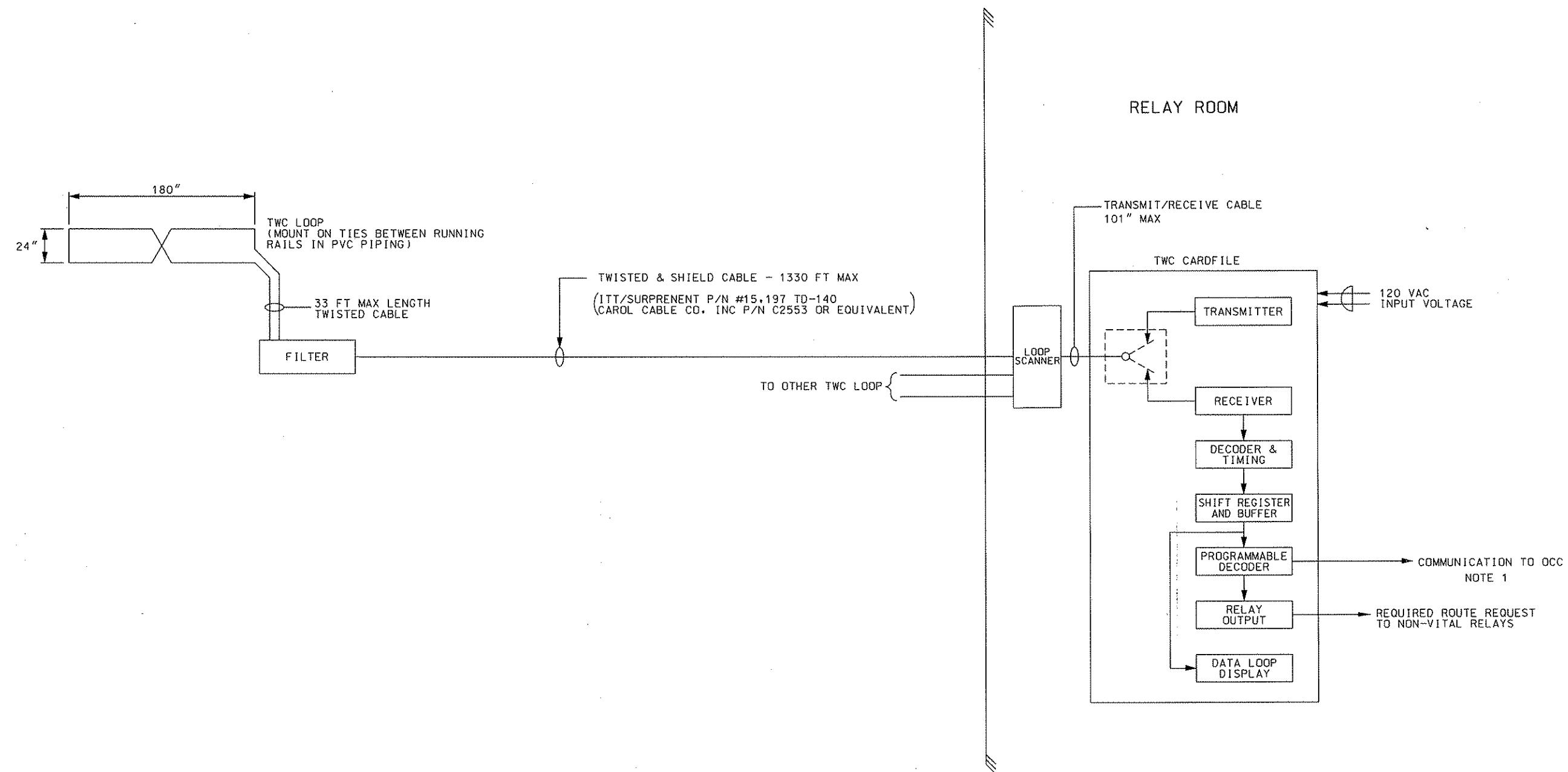
THE PREPARATION OF THIS DOCUMENT HAS BEEN
FINANCED IN PART THROUGH A GRANT FROM THE
FEDERAL TRANSIT ADMINISTRATION, U.S.
DEPARTMENT OF TRANSPORTATION, UNDER THE
URBAN MASS TRANSPORTATION ACT OF 1964,
AS AMENDED, FOR THE PORT AUTHORITY OF
ALLEGHENY COUNTY, PENNSYLVANIA.



DMJM HARRIS | **AECOM**
FOUR GATEWAY CENTER
20TH FLOOR
PITTSBURGH, PA. 15222
Daniel P. Henry 4/28/08
APPROVED DATE

PORT AUTHORITY OF ALLEGHENY COUNTY
 PITTSBURGH PENNSYLVANIA

NORTH SHORE CONNECTOR
NSC TRAIN SYSTEM (SYSTEM WIDE)
TYPICAL
INTERLOCKING SYSTEM BLOCK DIAGRAM



NOTE:

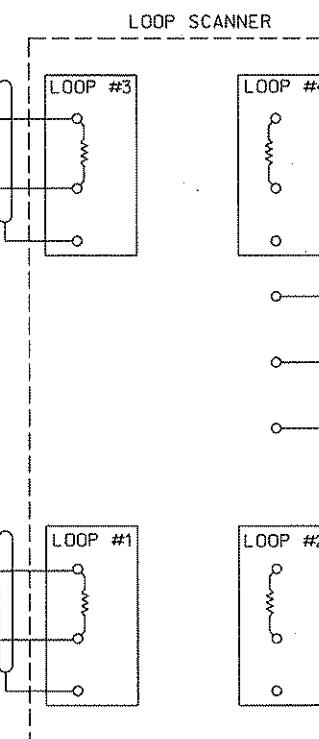
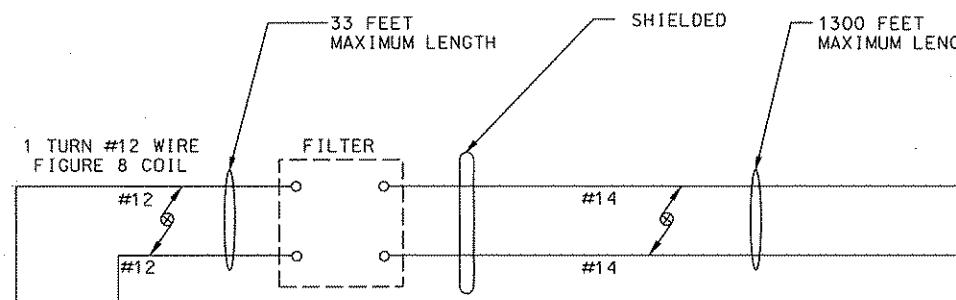
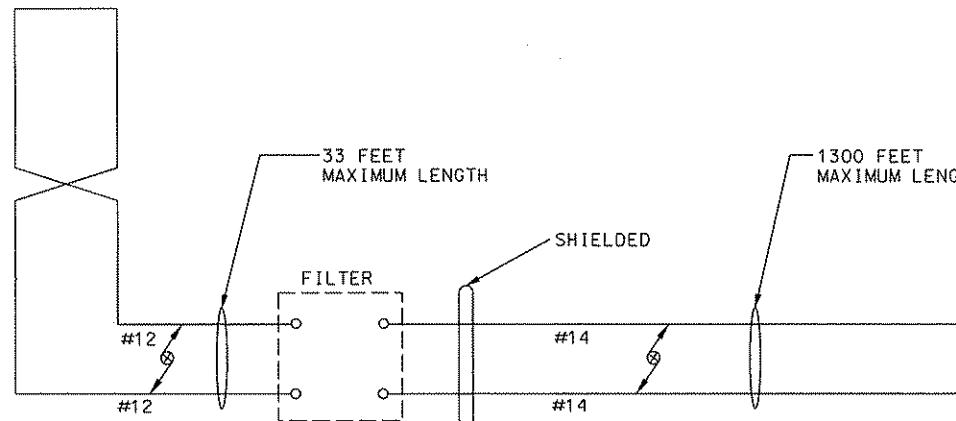
1. REFER TO DRAWINGS CM010, CM011, CM012 & CM013 FOR INTERFACE OF THE TWC SYSTEM WITH THE OPERATIONS CONTROL CENTER.

<p>Gannett Fleming Transit & Rail Systems</p>			<p>THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.</p>	<p>MICHAEL T. MCNAMARA PROFESSIONAL ENGINEER REGISTERED IN PENNSYLVANIA EXAMINED AND APPROVED BY THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA</p>	<p>NO. DATE</p>	<p>DESCRIPTION</p>	<p>REVISIONS</p>	<p>DMJM HARRIS</p>	<p>AECOM</p>	DESIGNED	L. NARANG	<p>PORT AUTHORITY OF ALLEGHENY COUNTY PITTSBURGH</p>
										DRAWN	H. T. TRAN	
										CHECKED	S. M. NARANG	<p>NORTH SHORE CONNECTOR NSC TRAIN SYSTEM (SYSTEM WIDE) TYPICAL TWC SYSTEM BLOCK DIAGRAM</p>
										IN CHARGE	C. D. JONES	
										DATE	APR. 28, 2008	
										SCALE	NTS	<p>Port Authority</p>
										CONTRACT NO.	NSC-009	
										DWG. NO.	SG053	
										SH. 355		

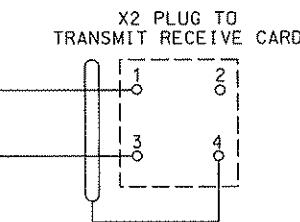
FIELD

ALLEGHENY RELAY ROOM

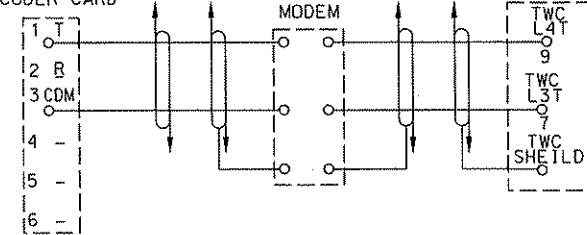
1 TURN #12 WIRE
FIGURE 8 COIL



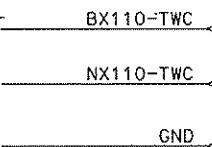
TRANSMIT RECEIVE CABLE
101 INCHES MAXIMUM LENGTH



X100 PLUG TO
DECODER CARD



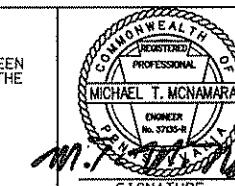
LINE CORD TO
INTERROGATOR
POWER SUPPLY



Gannett Fleming
Transit & Rail Systems

NO.	DATE	DESCRIPTION
REVISIONS		

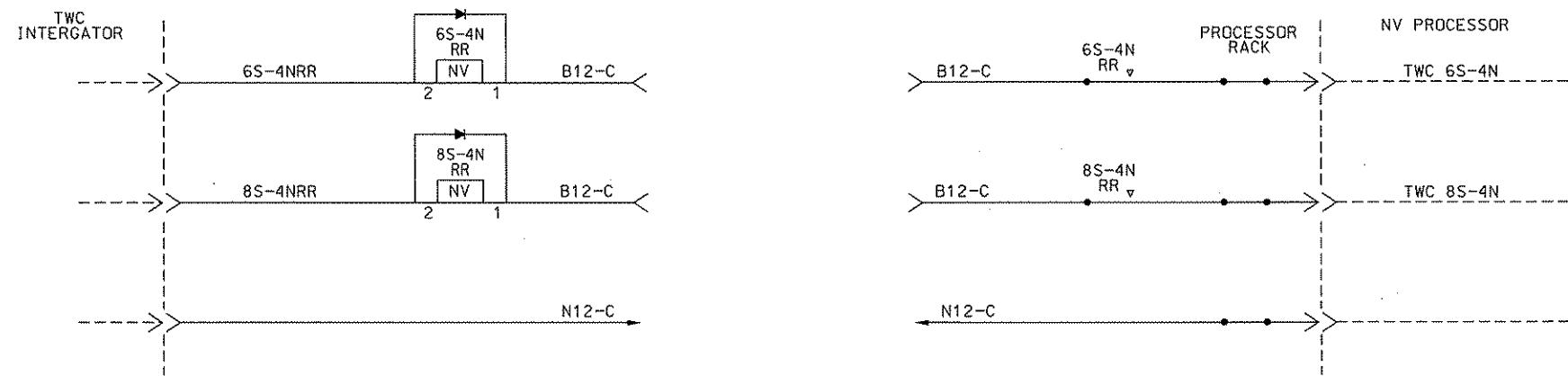
THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.



DMJM HARRIS | AECOM
FOUR GATEWAY CENTER
20TH FLOOR
PITTSBURGH, PA. 15222
CHECKED SM NARANG
IN CHARGE CD JONES
DATE APR. 28, 2008
SCALE NTS
APPROVED *David F. Henry 4/28/08*
SIGNATURE *Michael T. McNamara* APPROVED DATE

PORT AUTHORITY OF ALLEGHENY COUNTY
PITTSBURGH
NORTH SHORE CONNECTOR
NSC TRAIN SYSTEM (SYSTEM WIDE)
TYPICAL
TWC LOOP CIRCUITS
CONTRACT NO. NSC-009
DWG. NO. SG054 SH. 356

ALLEGHENY RELAY ROOM



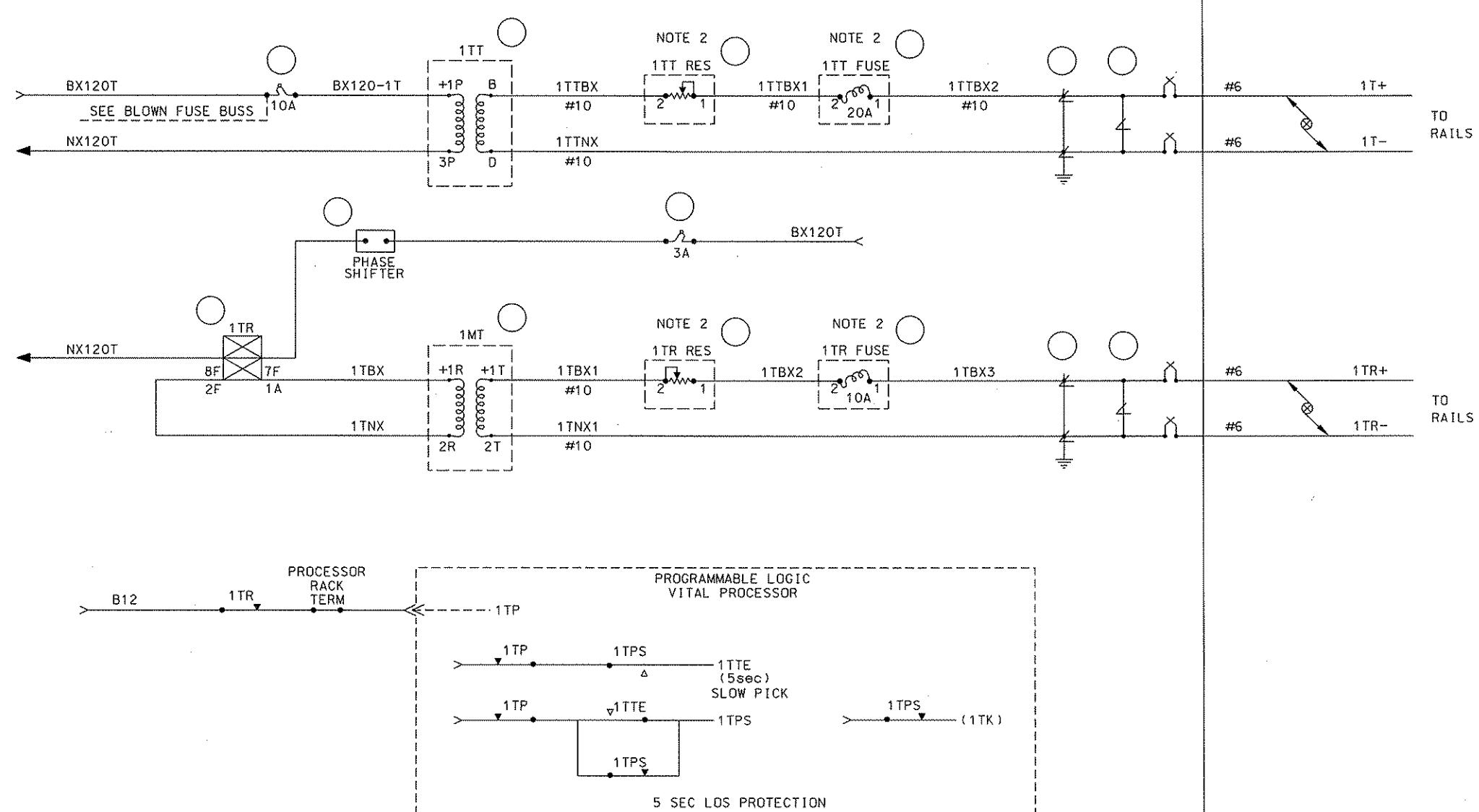
NOTE:

1. ALL TWC ROUTES SHALL HAVE CANCEL FUNCTION.

 Gannett Fleming Transit & Rail Systems			<p>THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 5%;">NO.</th><th style="width: 10%;">DATE</th><th style="width: 40%;">DESCRIPTION</th><th style="width: 45%;">REVISIONS</th></tr> </thead> </table>	NO.	DATE	DESCRIPTION	REVISIONS	 MICHAEL T. McNAMARA OWNER PA-3736-R	DMJM HARRIS AECOM FOUR GATEWAY CENTER 20TH FLOOR PITTSBURGH, PA. 15222	DESIGNED SM NARANG DRAWN HT TRAN	PORT AUTHORITY OF ALLEGHENY COUNTY PITTSBURGH	
NO.	DATE	DESCRIPTION	REVISIONS									
CHECKED JF SAMEAN IN CHARGE CD JONES DATE APR. 28, 2008 Port Authority CONTRACT NO. NSC-009 DWG. NO. SG055 SHT. 357	NORTH SHORE CONNECTOR NSC TRAIN SYSTEM (SYSTEM WIDE) TYPICAL TWC LOOP REQUESTS											
						SIGNATURE <i>Michael T. McNamara</i> APPROVED <i>David P. Henry 4/28/08</i> DATE <i>4/28/08</i>						

ALLEGHENY RELAY ROOM

FIELD



LEGENDS:

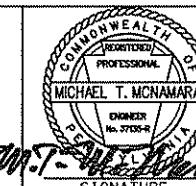
() = MATERIAL REFERENCE.
() = BIT TO NV PROCESSOR

NOTES:

1. WIRING THIS SHEET #14 UNLESS NOTED.
 2. 1TT/1TR RESISTORS & FUSES SHALL BE PLACED IN THE POLARITY WHICH EVER IS CONNECTED TO SIGNAL RAIL



THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.



DMJM HARRIS | **AECOM**
FOUR GATEWAY CENTER
20TH FLOOR
PITTSBURGH, PA. 15222
Daniel P. Harrington 4/28/08
APPROVED DATE

PITTSBURGH

PENNSYLVANIA

NORTH SHORE CONNECTOR

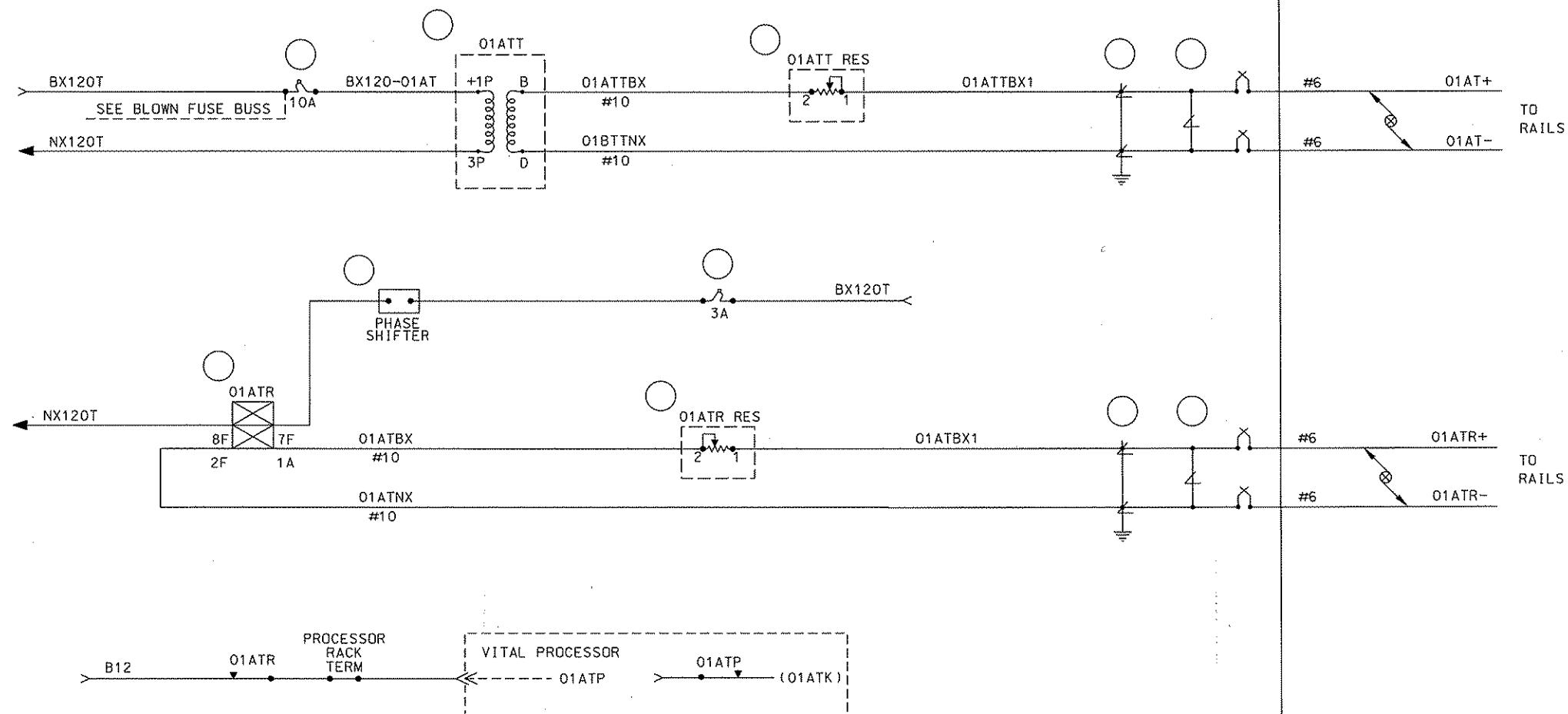
NSC TRAIN SYSTEM (SYSTEM WIDE)

TYPICAL

INTERLOCKING TRACK CIRCUIT

ALLEGHENY RELAY ROOM

FIELD

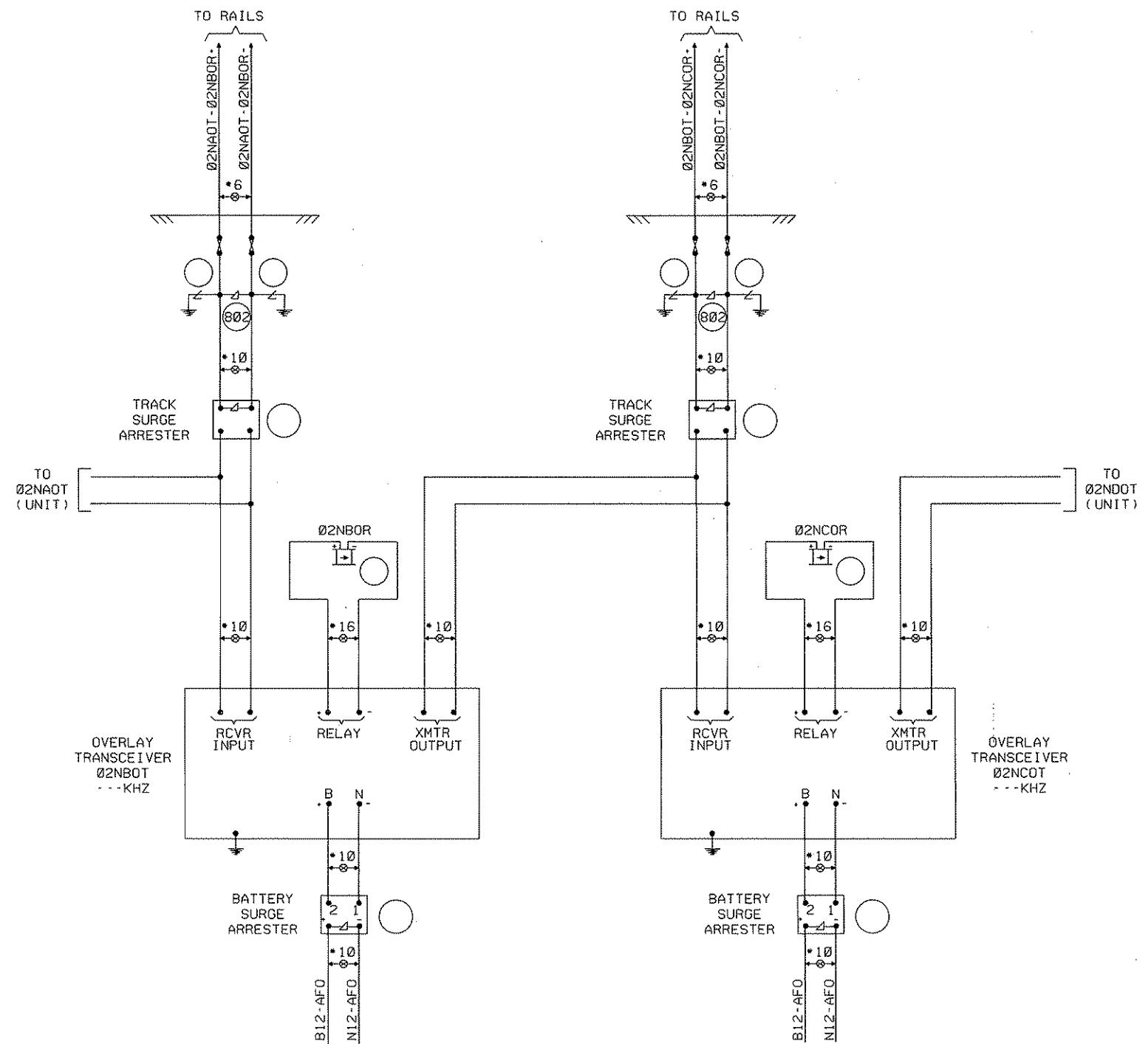
LEGENDS:

- (○) = MATERIAL REFERENCE.
- (-) = BIT TO NV PROCESSOR.

NOTE:

1. WIRING THIS SHEET #14 UNLESS NOTED.

 Gannett Fleming Transit & Rail Systems		<p>THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">NO.</th><th style="text-align: left;">DATE</th><th style="text-align: left;">DESCRIPTION</th></tr> </thead> <tbody> <tr> <td></td><td></td><td>REVISIONS</td></tr> </tbody> </table>	NO.	DATE	DESCRIPTION			REVISIONS	 COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL MICHAEL T. McNAMARA OWNER ELECTRICAL CONTRACTOR SIGNATURE	DMJM HARRIS AECOM FOUR GATEWAY CENTER 20TH FLOOR PITTSBURGH, PA. 15222 <i>[Handwritten signatures]</i>	DESIGNED BY SM NARANG DRAWN BY HT TRAN	PORT AUTHORITY OF ALLEGHENY COUNTY PITTSBURGH NORTH SHORE CONNECTOR GATEWAY /CONVENTION CENTER LINE TYPICAL APPROACH TRACK CIRCUIT
NO.	DATE	DESCRIPTION										
		REVISIONS										
CHECKED BY JF SAMEAN IN CHARGE CD JONES DATE APR. 28, 2008 SCALE NTS												



ALLEGHENY RELAY ROOM

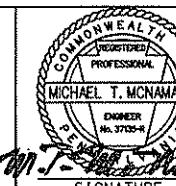
LEGENDS:

- () = MATERIAL REFERENCE.
 () = BIT TO NV PROCESSOR.
 ←→ = TWISTED PAIR.



NO.	DATE	DESCRIPTION
REVISIONS		

THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964. AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.



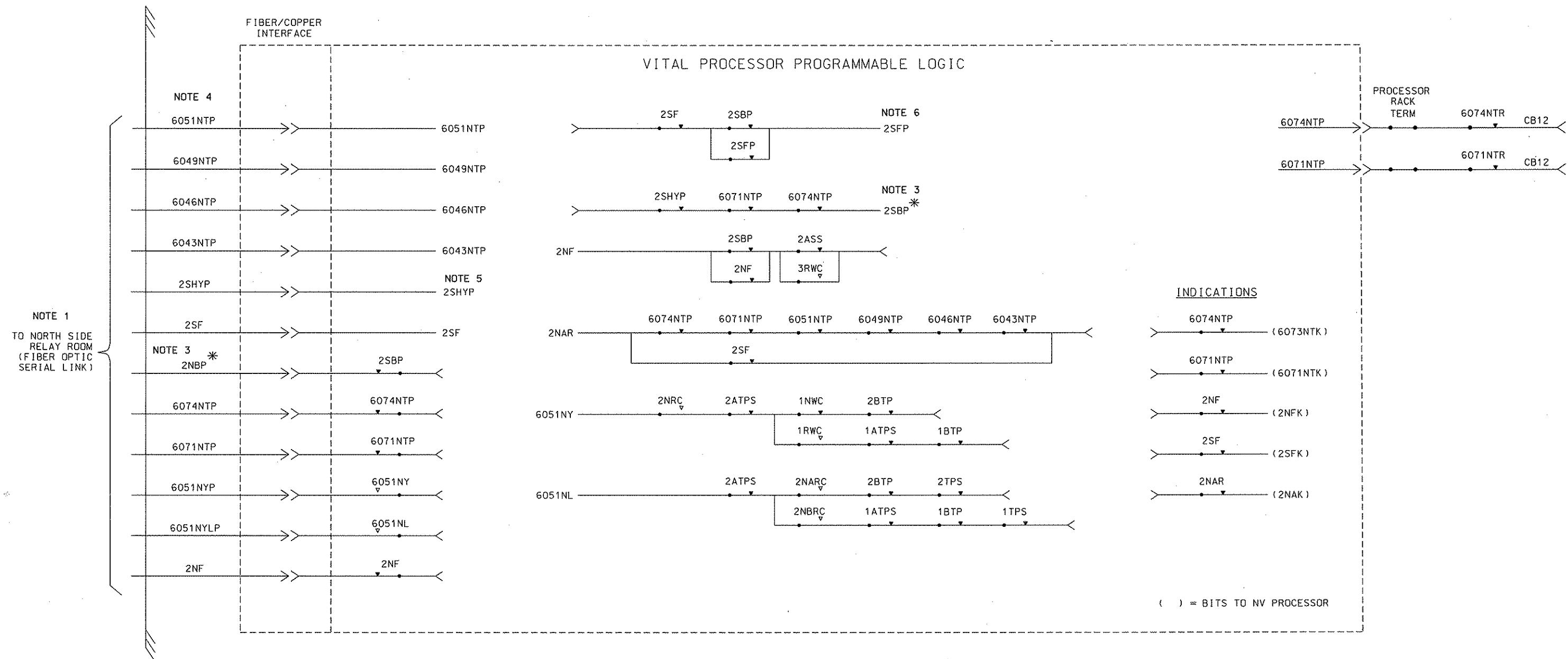
DMJM HARRIS | **AECOM**
FOUR GATEWAY CENTER
20TH FLOOR
PITTSBURGH, PA. 15222
Daniel P. Harrington 4/28/08
APPROVED DATE

**PITTSBURGH
PORT AUTHORITY OF ALLEGHENY COUNTY
PENNSYLVANIA**

**NORTH SHORE CONNECTOR
NSC TRAIN SYSTEM (SYSTEM WIDE)
TYPICAL
TIMING SECTION OVERLAY CIRCUITS**

Port Authority connecting people to life	CONTRACT NO. NSC-009	
	DWG. NO.	SG061

ALLEGHENY RELAY ROOM

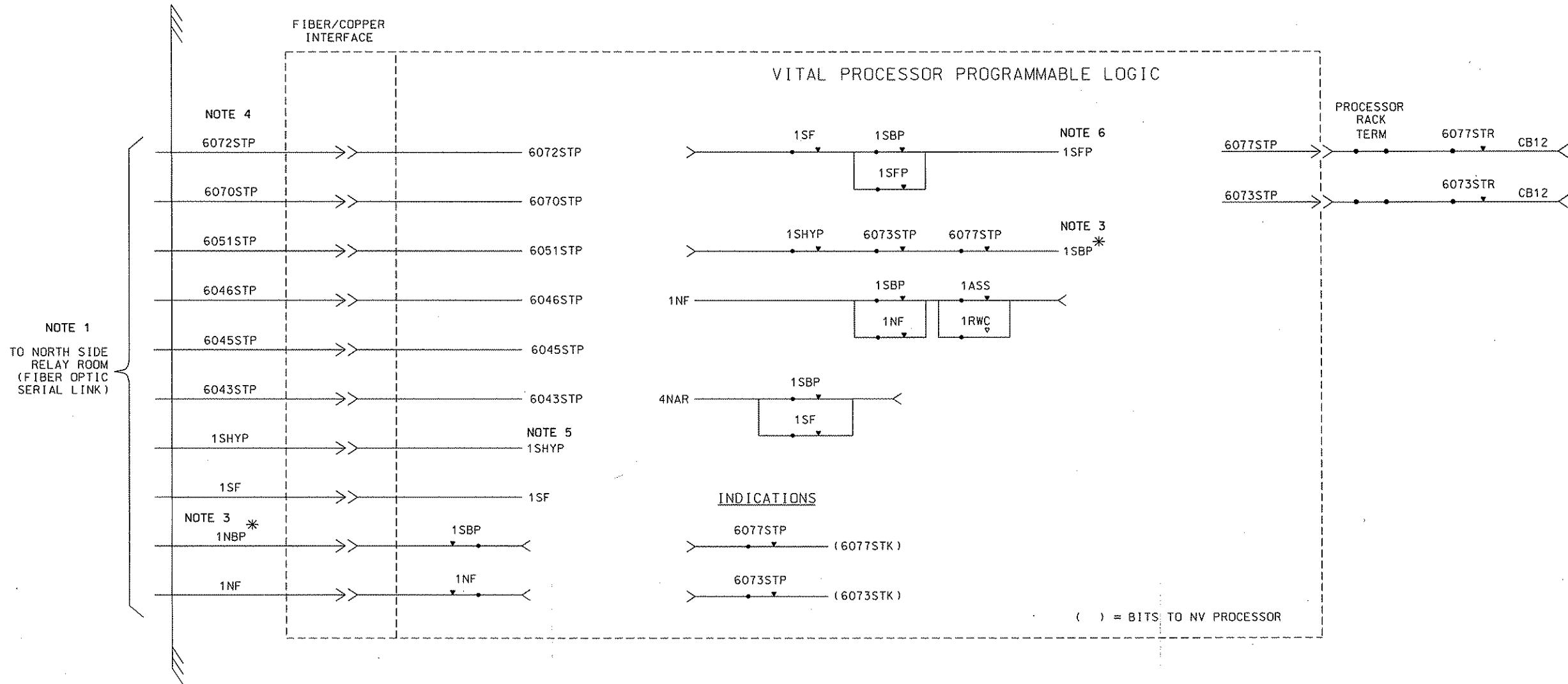


NOTES:

1. LINE CIRCUITS WILL BE FIBER OPTIC CABLES BETWEEN ALLEGHENY RELAY ROOM TO NORTHSIDE RELAY ROOM AND NORTHSIDE RELAY ROOM TO NEW GATEWAY RELAY ROOM.
2. THE CONTRACTOR SHALL INSTALL COPPER EXPRESS CABLES BETWEEN THE EXISTING GATEWAY RELAY ROOM AND THE NEW GATEWAY RELAY ROOM AS SHOWN ON THE TRACK AND CABLE PLANS.
3. * = BLOCK REPEATERS OF ALL TRACK CIRCUITS BETWEEN ALLEGHENY & GATEWAY INTERLOCKINGS.
4. EQUIVALENT SERIAL BITS.
5. 2SHYP IS REPEATER OF ALL TRACK 2 BLOCK TRACK CIRCUITS FROM GATEWAY & NORTHSIDE RELAY ROOMS.
6. 2SFP TRAFFIC REPEATER TO BE USED IN ROUTE CHECK LOGIC.

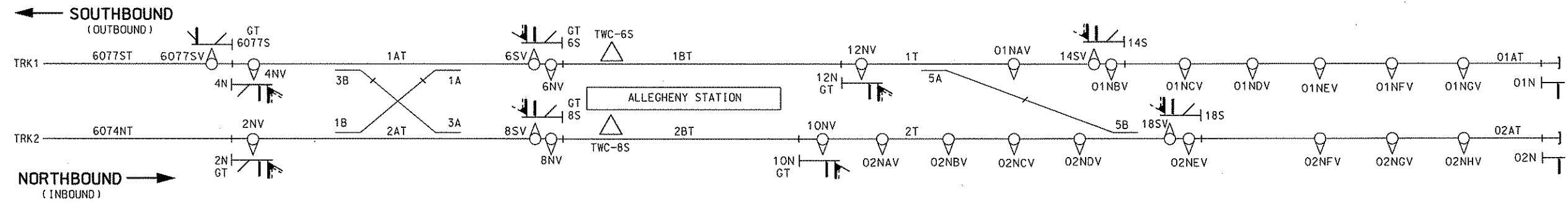
				<small>THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.</small>		DMJM HARRIS AECOM <small>FOUR GATEWAY CENTER 20TH FLOOR PITTSBURGH, PA. 15222</small>	<small>DESIGNED SM NARANG DRAWN HT TRAN</small>	PORT AUTHORITY OF ALLEGHENY COUNTY <small>PITTSBURGH NORTH SHORE CONNECTOR NSC TRAIN SYSTEM (SYSTEM WIDE) TYPICAL TRAFFIC & LINE CIRCUITS LOGIC - NORTHBOUND TRACK 2</small>		
	NO.	DATE	DESCRIPTION					REVISIONS	APPROVED	DATE

ALLEGHENY RELAY ROOM


NOTES:

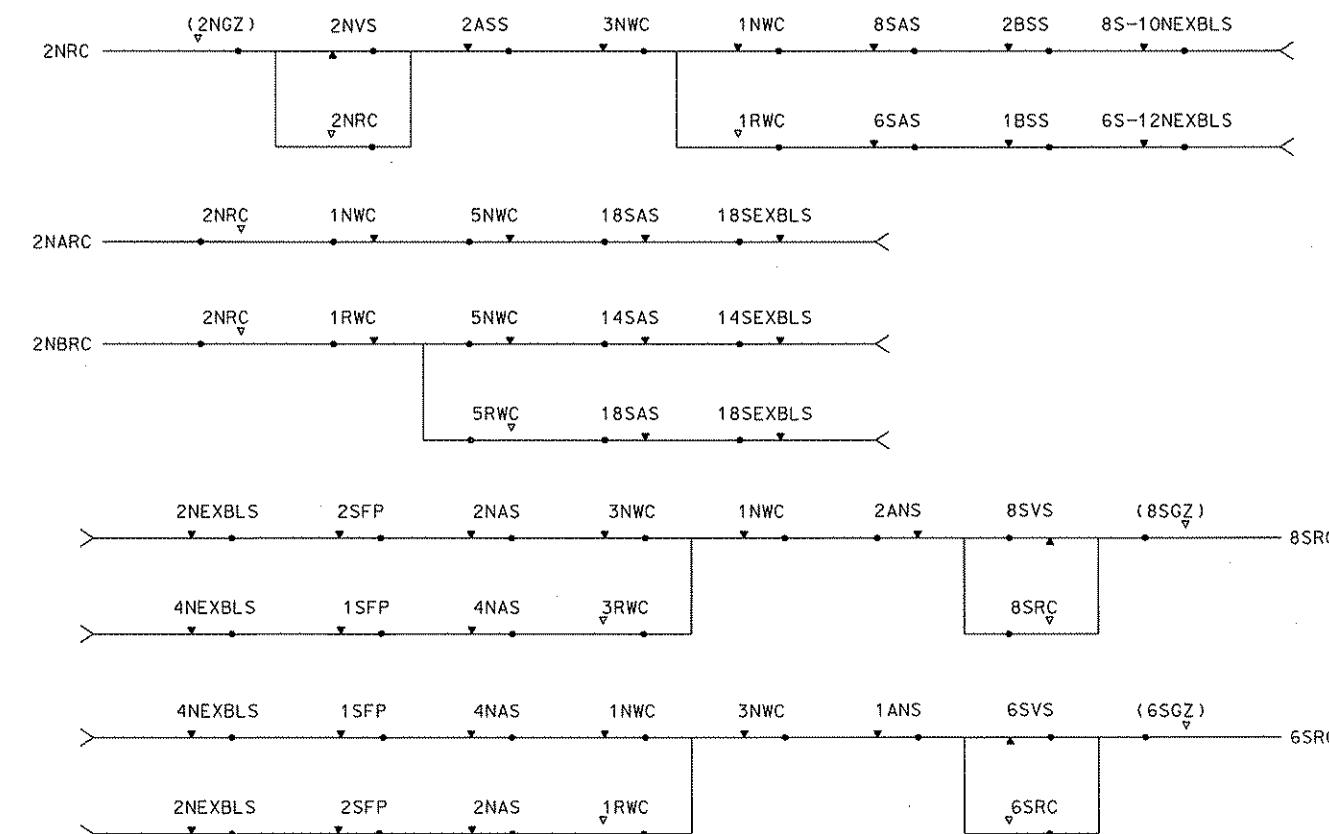
- LINE CIRCUITS WILL BE FIBER OPTIC CABLES BETWEEN ALLEGHENY RELAY ROOM TO NORTHSIDE RELAY ROOM AND NORTHSIDE RELAY ROOM TO NEW GATEWAY RELAY ROOM.
- THE CONTRACTOR SHALL INSTALL COPPER EXPRESS CABLES BETWEEN THE EXISTING GATEWAY RELAY ROOM AND THE NEW GATEWAY RELAY ROOM AS SHOWN ON THE TRACK AND CABLE PLANS.
- * = BLOCK REPEATERS OF ALL TRACK CIRCUITS BETWEEN ALLEGHENY & GATEWAY INTERLOCKINGS.
- EQUIVALENT SERIAL BITS.
- 1SHYP IS REPEATER OF ALL TRACK 1 BLOCK TRACK CIRCUITS FROM GATEWAY & NORTHSIDE RELAY ROOMS.
- 1SFP TRAFFIC REPEATER TO BE USED IN ROUTE CHECK LOGIC.

 Gannett Fleming Transit & Rail Systems				<small>THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.</small>	 COMMONWEALTH OF PENNSYLVANIA PROFESSIONAL MICHAEL T. McNAMARA OWNER AL-JTSPR <i>[Signature]</i>	DMJM HARRIS AECOM FOUR GATEWAY CENTER 20TH FLOOR PITTSBURGH, PA. 15222 <i>[Signature]</i>	DESIGNED BY SM NARANG DRAWN BY HT TRAN CHECKED BY JF SAMEAN IN CHARGE BY CD JONES DATE APR. 28, 2008 SCALE BY NTS	PORT AUTHORITY OF ALLEGHENY COUNTY PITTSBURGH, PENNSYLVANIA NORTH SHORE CONNECTOR NSC TRAIN SYSTEM (SYSTEM WIDE) TYPICAL TRAFFIC & LINE CIRCUITS LOGIC - SOUTHBOUND TRACK 1	
								Port Authority <i>[Signature]</i>	CONTRACT NO. NSC-009 DWG. NO. SG065 SHT. 362



ALLEGHENY INTERLOCKING LAYOUT

VITAL PROGRAMMABLE LOGIC



() = BIT FROM NV PROCESSOR



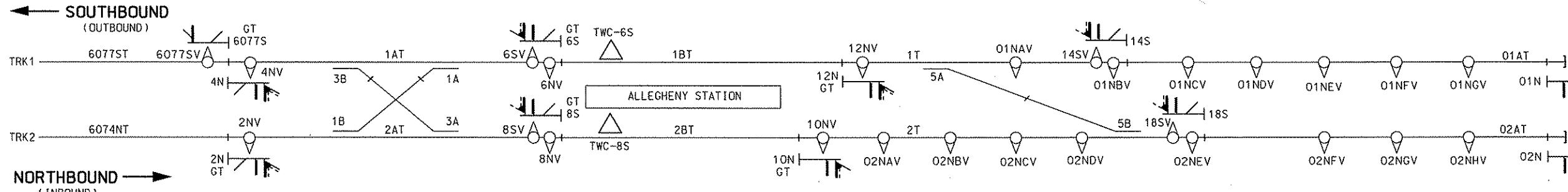
THE PREPARATION OF THIS DOCUMENT HAS BEEN
FINANCED IN PART THROUGH A GRANT FROM THE
FEDERAL TRANSIT ADMINISTRATION, U.S.
DEPARTMENT OF TRANSPORTATION, UNDER THE
URBAN MASS TRANSPORTATION ACT OF 1964,
AS AMENDED, FOR THE PORT AUTHORITY OF
ALLENTOWN, PENNSYLVANIA.



DESIGNED	SM NARANG
DRAWN	HT TRAN
CHECKED	JF SAMEAN
IN CHARGE	CD JONES
DATE	APR. 28, 2008
SCALE	NTS

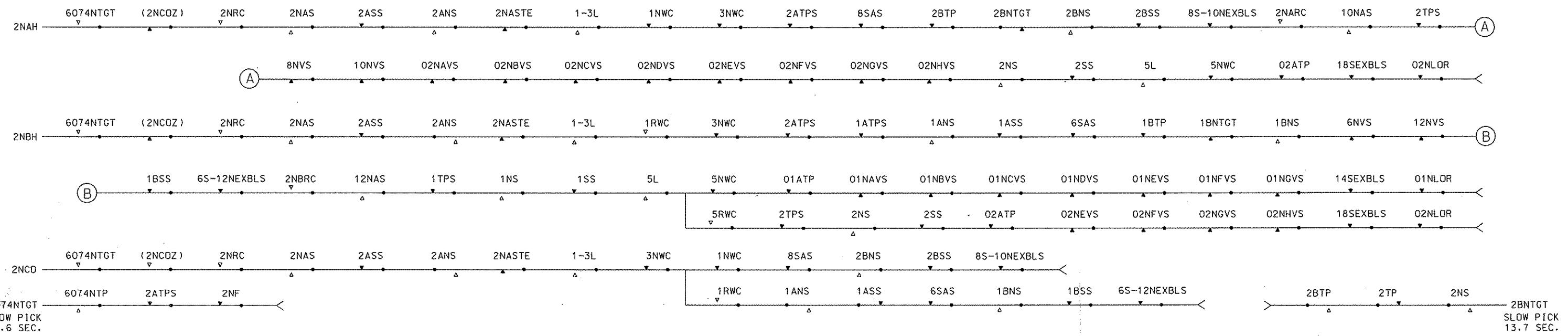
PORT AUTHORITY OF ALLEGHENY COUNTY
 PITTSBURGH PENNSYLVANIA

NORTH SHORE CONNECTOR
 NSC TRAIN SYSTEM (SYSTEM WIDE)
 TYPICAL
 ROUTE CHECK LOGIC



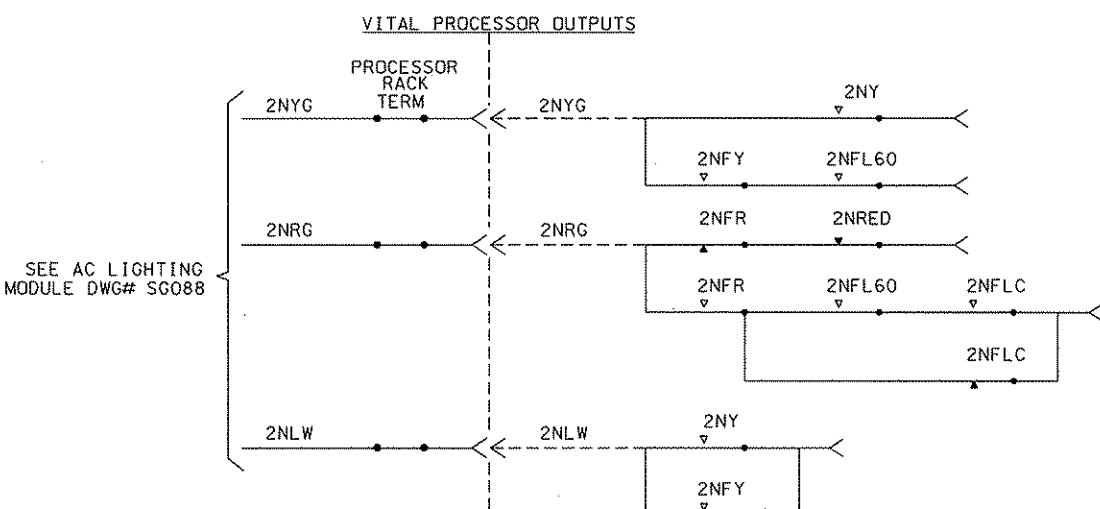
ALLEGHENY INTERLOCKING LAYOUT

VITAL PROGRAMMABLE LOGIC

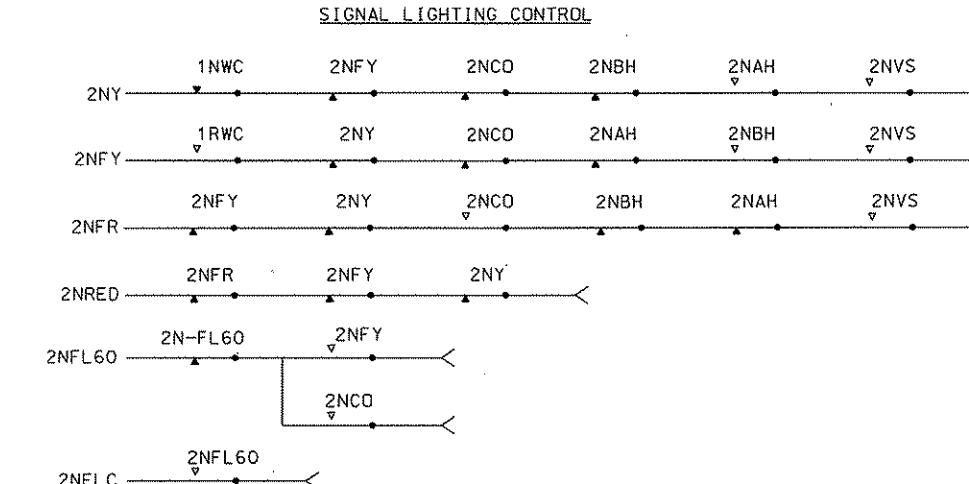


LOW PICK
- 6 SEC.

- 2BNTGT
SLOW PICK
13.7 SEC.

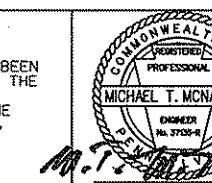


2NFL60 FLASHER WILL FLASH 60.
PULSES PER MINUTE 50% ON 50% OFF.
EXACT FLASH RATE TO BE DETERMINED BY PAA



SLOW RELEASE
FOR 2 FLASH

() = BIT FROM NV PROCESSOR
[] = SERIAL BIT TO NV PROCESSOR



DMJM HARRIS | AECC
FOUR GATEWAY CENTER
20TH FLOOR
PITTSBURGH, PA. 15222

THE PREPARATION OF THIS DOCUMENT WAS BE-
FINANCED IN PART THROUGH A GRANT FROM THE
FEDERAL TRANSIT ADMINISTRATION, U.S.
DEPARTMENT OF TRANSPORTATION, UNDER THE
URBAN MASS TRANSPORTATION ACT OF 1964.
AS AMENDED, FOR THE PORT AUTHORITY OF
ALLEGHENY COUNTY, PENNSYLVANIA.

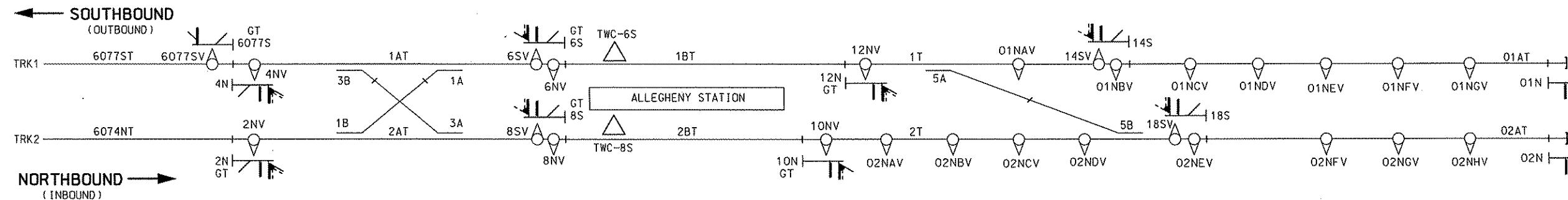
THE PREPARATION OF THIS DOCUMENT WAS BE-
FINANCED IN PART THROUGH A GRANT FROM THE
FEDERAL TRANSIT ADMINISTRATION, U.S.
DEPARTMENT OF TRANSPORTATION, UNDER THE
URBAN MASS TRANSPORTATION ACT OF 1964.
AS AMENDED, FOR THE PORT AUTHORITY OF
ALLEGHENY COUNTY, PENNSYLVANIA.

SIGNATURE _____ APPROVED _____ DATE _____

PORT AUTHORITY OF ALLEGHENY COUNTY
PITTSBURGH **PENNSYLVANIA**

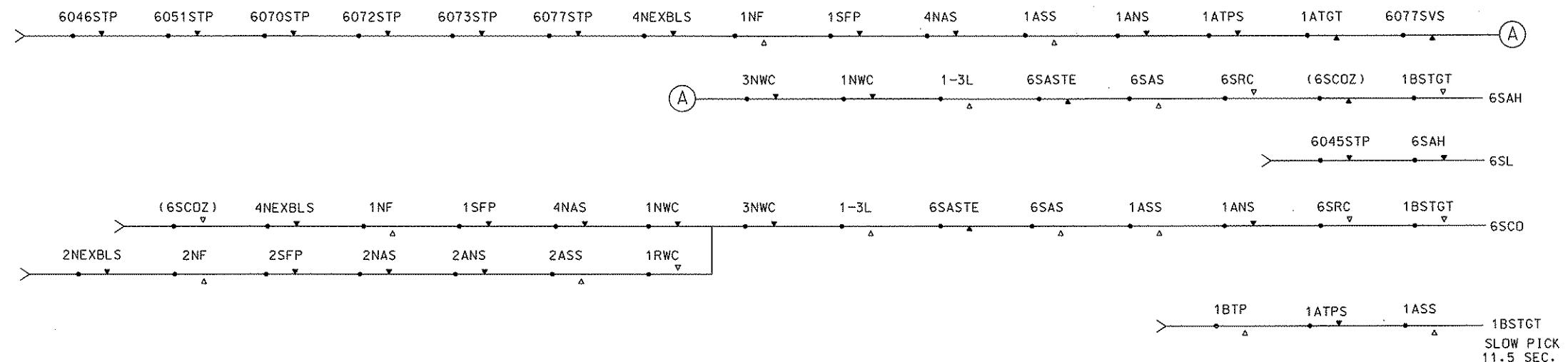
**NORTH SHORE CONNECTOR
NSC TRAIN SYSTEM (SYSTEM WIDE)
TYPICAL
SIGNAL CONTROL LOGIC - SIGNAL 2N**

Port Authority Connecting people to life	CONTRACT NO.	NSC-009
	DWG. NO.	SG072 SHT. 36

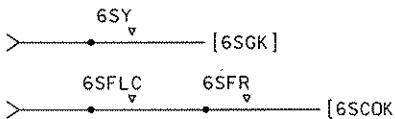


ALLEGHENY INTERLOCKING LAYOUT

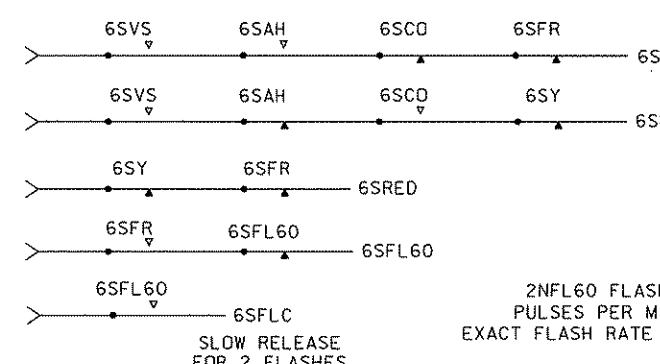
VITAL PROGRAMMABLE LOGIC



SIGNAL INDICATION

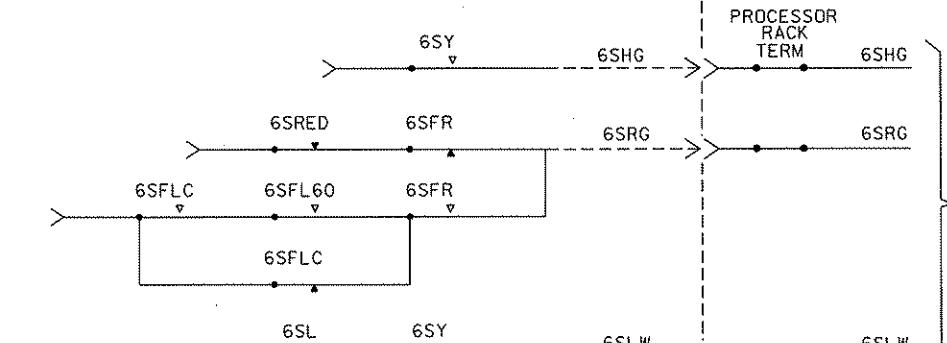


SIGNAL LIGHTING CONTROL



2NFL60 FLASHER WILL FLASH 60.
PULSES PER MINUTE 50% ON 50% OFF.
EXACT FLASH RATE TO BE DETERMINED BY PAAC.

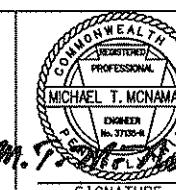
VITAL PROCESSOR OUTPUTS



SEE AC LIGHTING
MODULE DWG# SC088

() = BIT FROM NV PROCESSOR
[] = SERIAL BIT TO NV PROCESSOR

THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.



DMJM HARRIS | AECOM
FOUR GATEWAY CENTER
20TH FLOOR
PITTSBURGH, PA. 15222
M.T. McNamara *David J. Flory 4/28/08*
SIGNATURE APPROVED DATE

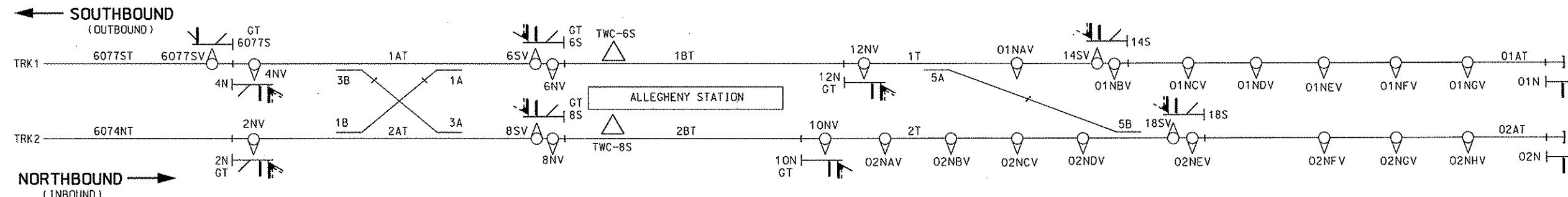
DESIGNED SM NARANG
DRAWN HT TRAN
CHECKED JF SAMEAN
IN CHARGE CD JONES
DATE APR. 28, 2008
SCALE NTS

PORT AUTHORITY OF ALLEGHENY COUNTY
PITTSBURGH
NORTH SHORE CONNECTOR
NSC TRAIN SYSTEM (SYSTEM WIDE)
TYPICAL
SIGNAL CONTROL LOGIC - SIGNAL 6S

Port Authority
CONTRACT NO.: NSC-009
DWG. NO.: SG073
SHT. 365

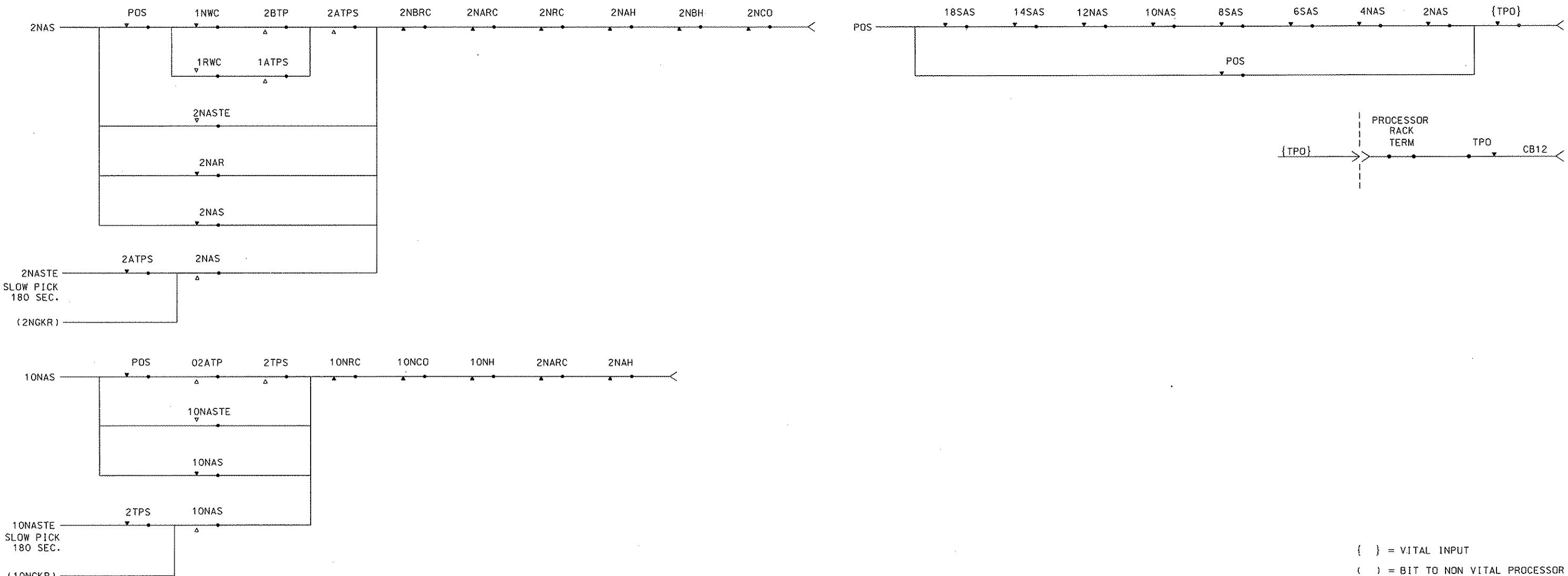
Gannett Fleming
Transit & Rail Systems

NO.	DATE	DESCRIPTION
REVISIONS		



ALLEGHENY INTERLOCKING LAYOUT

VITAL PROGRAMMABLE LOGIC

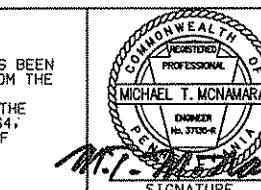


{ } = VITAL INPUT
() = BIT TO NON VITAL PROCESSOR

THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.

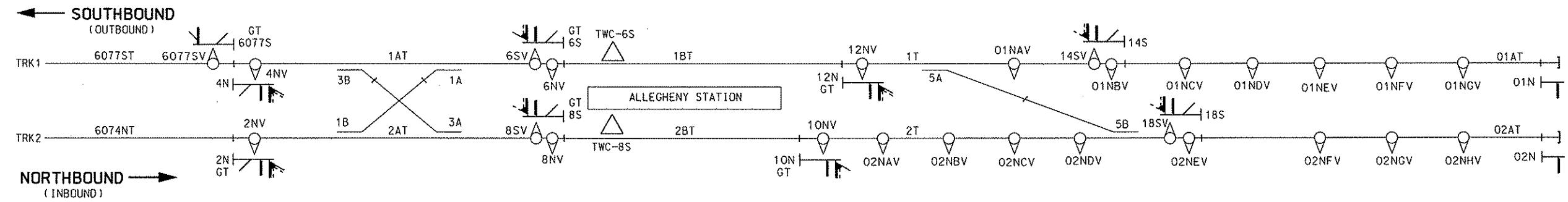
Gannett Fleming
Transit & Rail Systems

NO.	DATE	DESCRIPTION
REVISIONS		



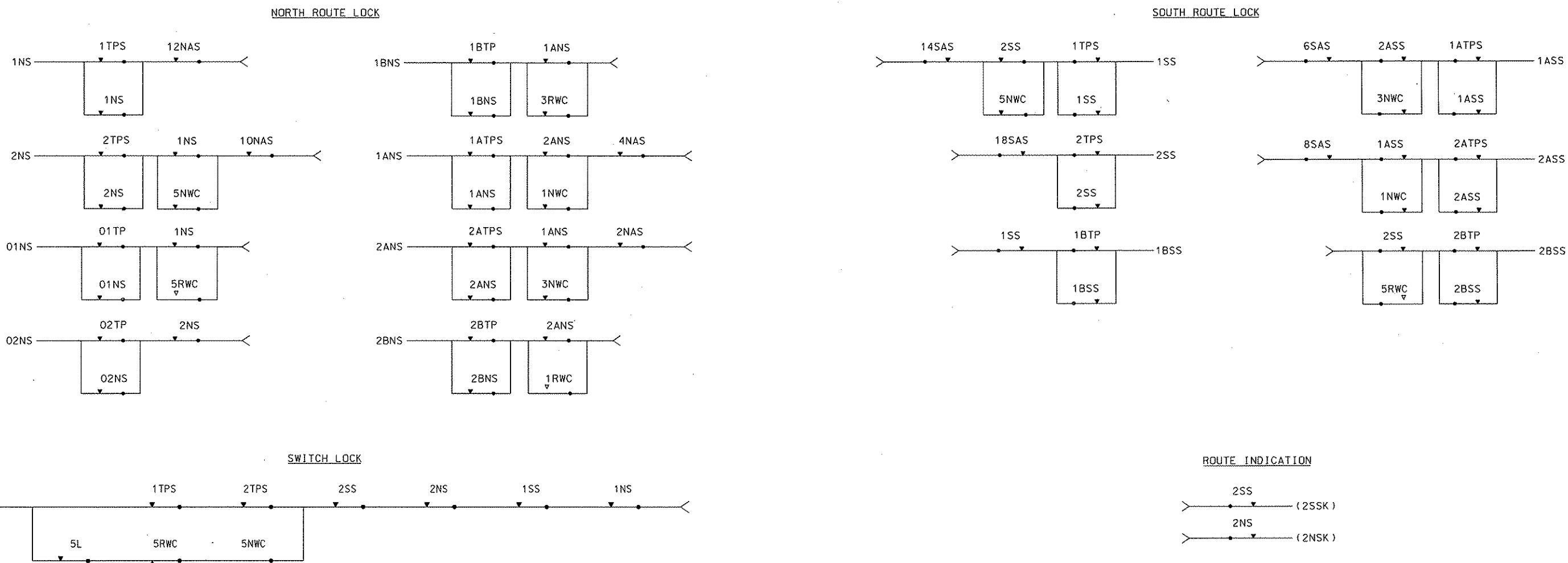
DMJM HARRIS | AECOM
FOUR GATEWAY CENTER
20TH FLOOR
PITTSBURGH, PA. 15222
MICHAEL T. MCNAULRA
DRAWER NO. 3705-P
APPROVED
SIGNATURE
APPROVED
DATE
APR. 28, 2008

PORT AUTHORITY OF ALLEGHENY COUNTY
PITTSBURGH
NORTH SHORE CONNECTOR
NSC TRAIN SYSTEM (SYSTEM WIDE)
TYPICAL
APPROACH & TIME LOCKING LOGIC
CONTRACT NO. NSC-009
DWG. NO. SG074
SHT. 366



ALLEGHENY INTERLOCKING LAYO

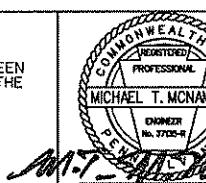
VITAL PROGRAMMABLE LOGIC



() = 8 BIT TO NY PROCESSOR



THE PREPARATION OF THIS DOCUMENT HAS BEEN
FINANCED IN PART THROUGH A GRANT FROM THE
FEDERAL TRANSIT ADMINISTRATION, U.S.
DEPARTMENT OF TRANSPORTATION, UNDER THE
URBAN MASS TRANSPORTATION ACT OF 1964,
AS AMENDED, FOR THE PORT AUTHORITY OF
ALLEGHENY COUNTY, PENNSYLVANIA.

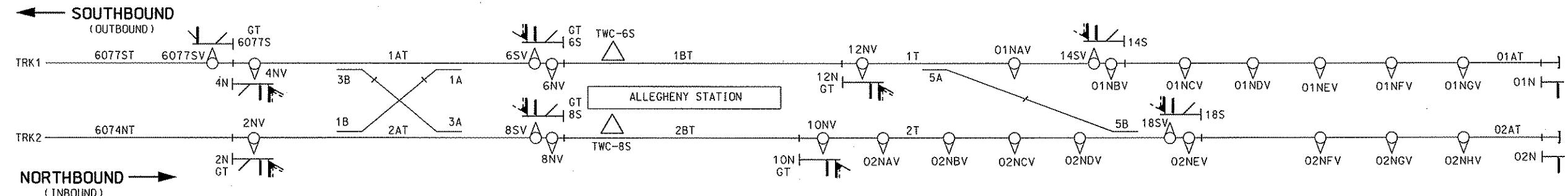


DMJM HARRIS | AECON
FOUR GATEWAY CENTER
20TH FLOOR
PITTSBURGH, PA. 15222
[Signature] **Daniel P. Harrington** 4/28/08
APPROVED DATE

DESIGNED	SM NARANG
DRAWN	HT TRAN
CHECKED	JF SAMEAN
IN CHARGE	CD JONES
DATE	APR. 28, 2008
SCALE	NTS

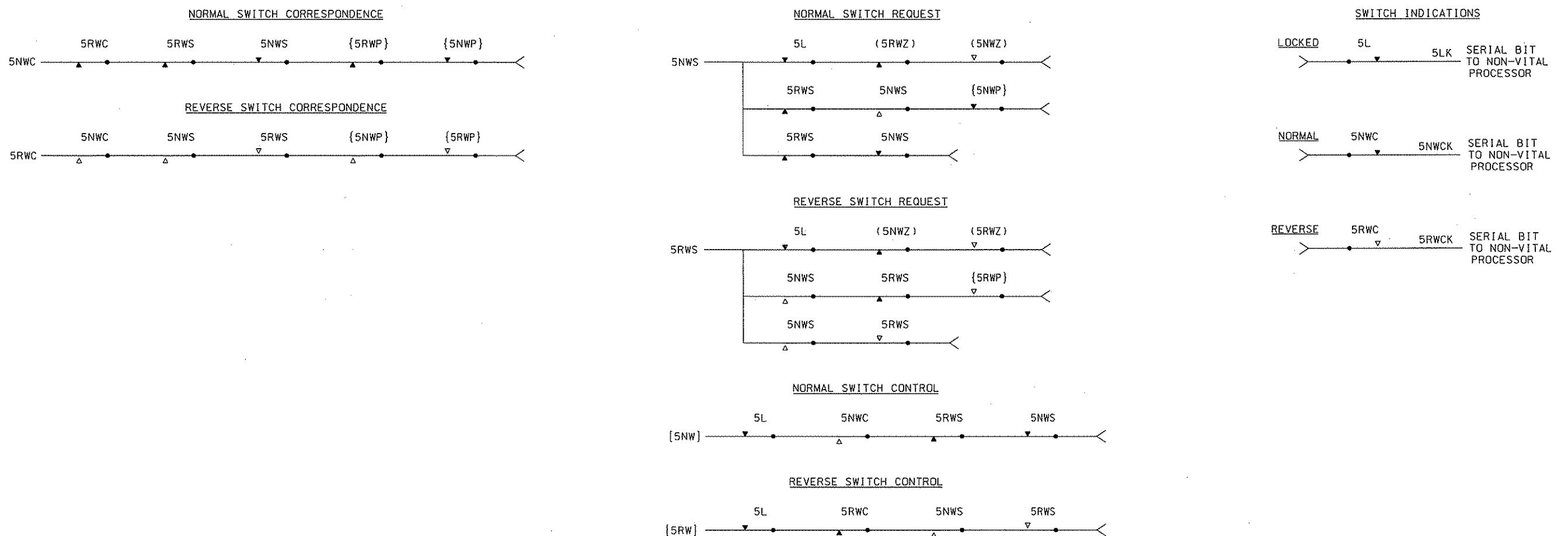
PITTSBURGH PORT AUTHORITY OF ALLEGHENY COUNTY PENNSYLVANIA

**NORTH SHORE CONNECTOR
NSC TRAIN SYSTEM (SYSTEM WIDE)
TYPICAL
ROUTE & SWITCH LOCKING LOGIC**



ALLEGHENY INTERLOCKING LAYO

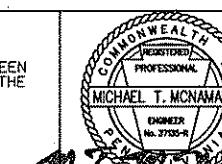
VITAL PROGRAMMABLE LOGIC



() = BIT FROM NV PROCESSOR
 [] = VITAL PROCESSOR OUTPUT BIT
 { } = VITAL INPUT



THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.



DMJM HARRIS AEC
FOUR GATEWAY CENTER
20TH FLOOR
PITTSBURGH, PA. 15222
Daniel F. Harris 4/26
APPROVED DAT

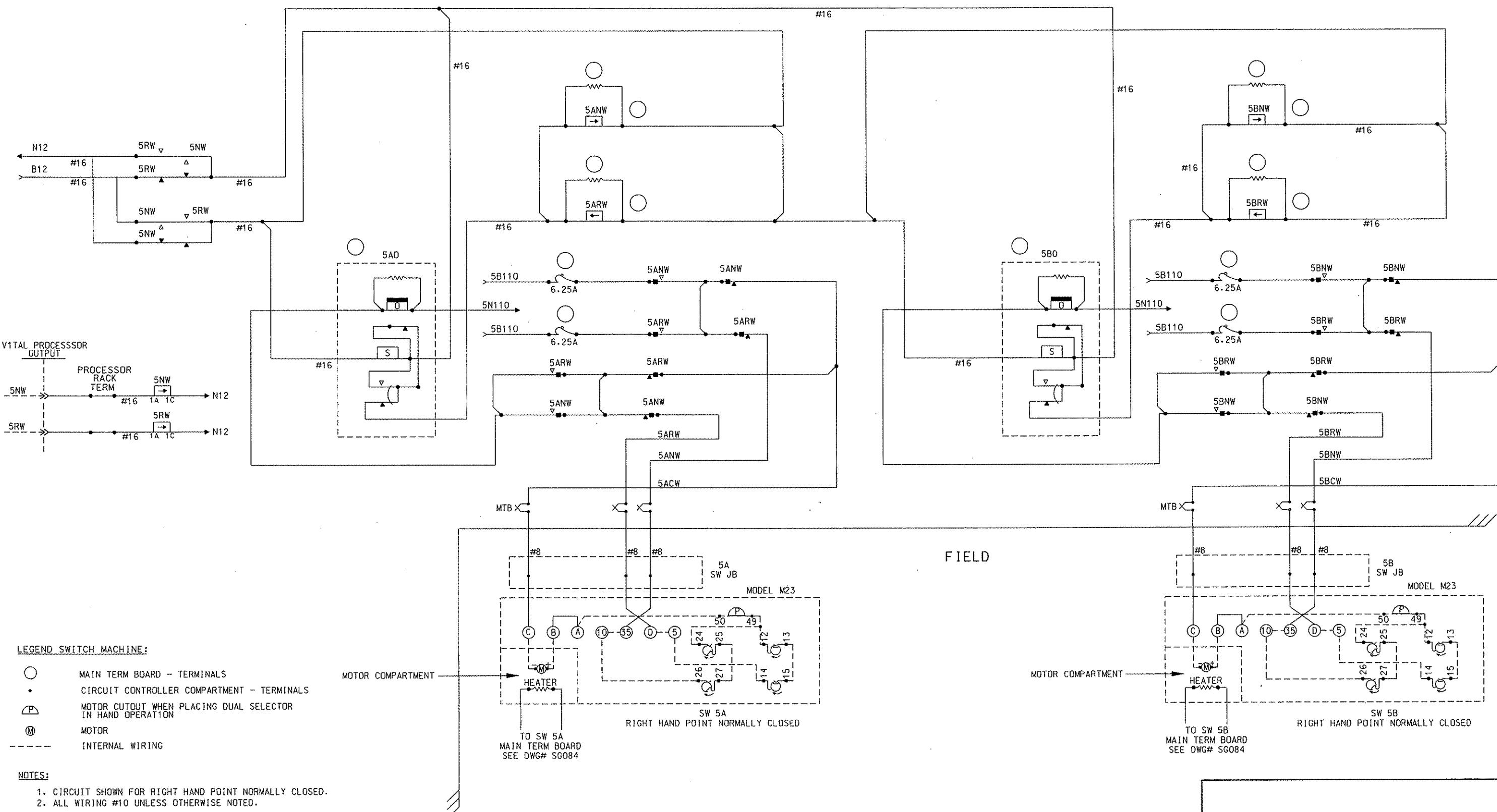
DESIGNED	SM NARANG
DRAWN	JC TRAUM
CHECKED	JF SAMEAN
IN CHARGE	CD JONES
DATE	APR. 28, 2008
SCALE	NTS

PORT AUTHORITY OF ALLEGHENY COUNTY
 PITTSBURGH PENNSYLVANIA

NORTH SHORE CONNECTOR
NSC TRAIN SYSTEM (SYSTEM WIDE)
TYPICAL

SWITCH REQUEST & CORRESPONDENCE LOGIC

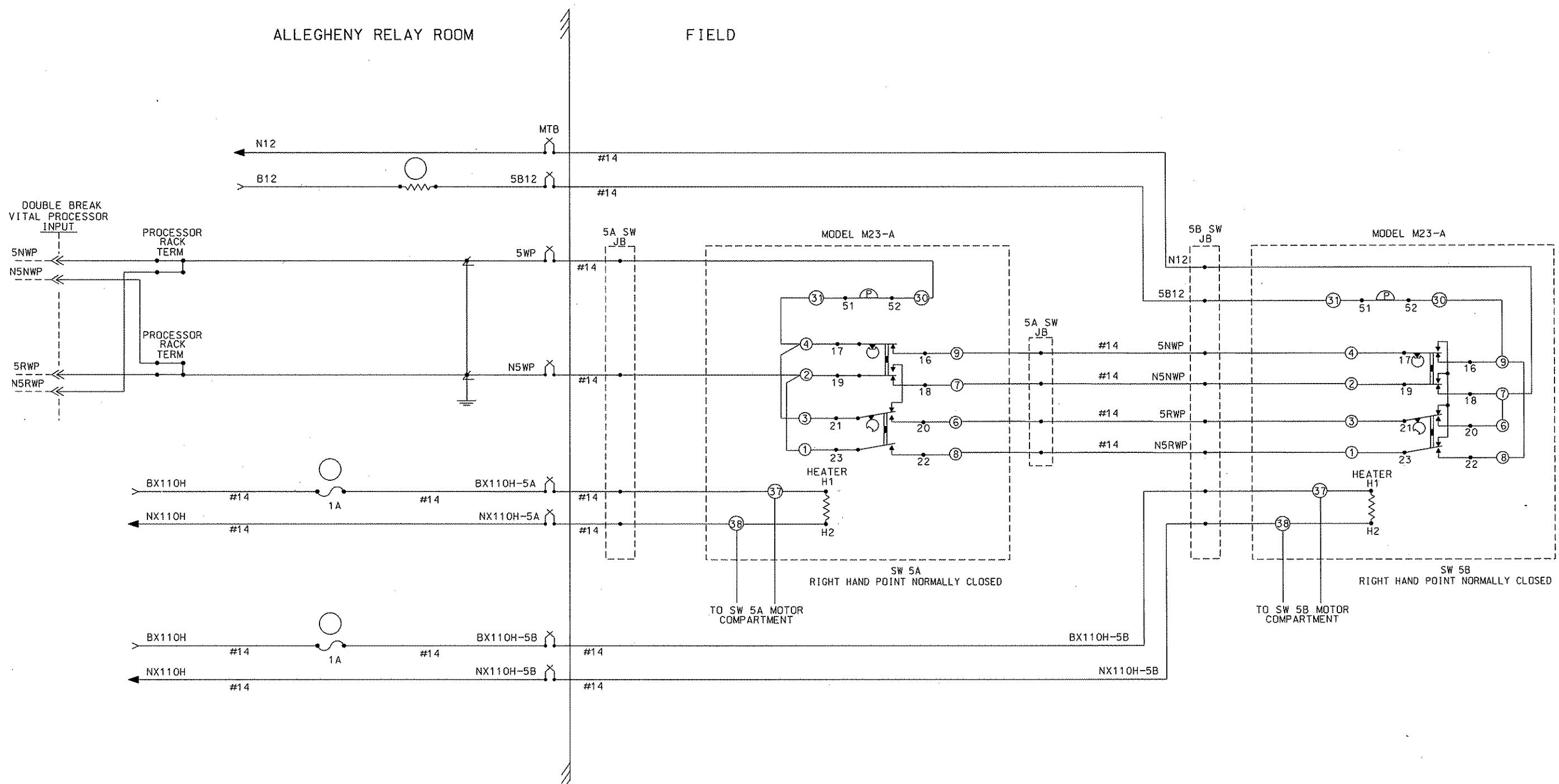
ALLEGHENY RELAY ROOM



 Gannett Fleming Transit & Rail Systems			<p>THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.</p>	 COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ENGINEER MICHAEL T. MCNAMARA LICENSE NO. 3735-R	DMJM HARRIS AECOM FOUR GATEWAY CENTER 20TH FLOOR PITTSBURGH, PA. 15222	DESIGNED BY SM NARANG DRAWN BY HT TRAN	PORT AUTHORITY OF ALLEGHENY COUNTY PITTSBURGH PENNSYLVANIA
NO. DATE	DESCRIPTION	REVISIONS		 Michael T. McNamara APPROVED DATE	JF SAMEAN IN CHARGE CD JONES	APR. 28, 2008 SCALE NTS	NORTH SHORE CONNECTOR NSC TRAIN SYSTEM (SYSTEM WIDE) TYPICAL SWITCH MACHINE OPERATING CIRCUIT
				 David P. Henry 4/28/08	HT TRAN DATE		Port Authority CONTRACT NO. NSC-009 DWG. NO. SG082 SHT. 369

ALLEGHENY RELAY ROOM

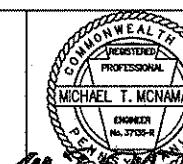
FIELD



NOTES:

- CASE WIRING THIS SHEET #16, UNLESS NOTED.
- FAR END XOVER ADD BUS STRAP 6 TO 7 AND 8 TO 9 TO 30.
NEAR END XOVER ADD BUS STRAP 1 TO 2 AND 3 TO 4 TO 31.
- (P) - INDICATION CUTOUT WHEN PLACING DUAL SELECTOR IN HAND OPERATION.

THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.



MICHAEL T. McNAMARA

PENNSYLVANIA

REGISTRATION NO. 3705-R

EXPIRES 4/28/08

SIGNATURE

APPROVED

DATE

4/28/08

JF SAMEAN

IN CHARGE

CD JONES

DATE

APR. 28, 2008

SCALE

NTS

4/28/08

APPROVED

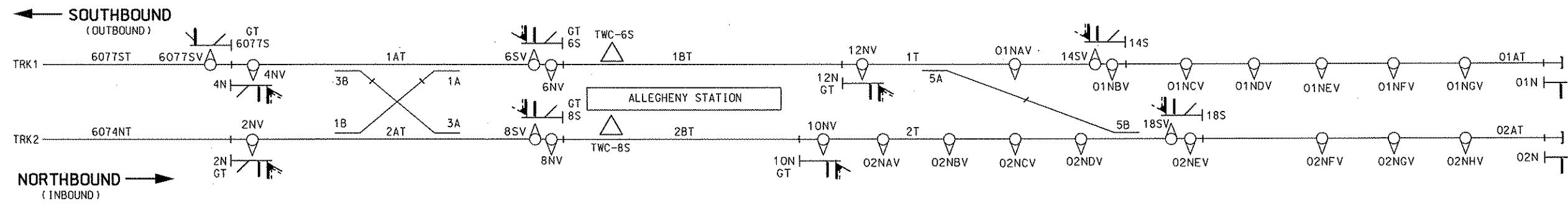
DATE

4/28/08

SIGNATURE

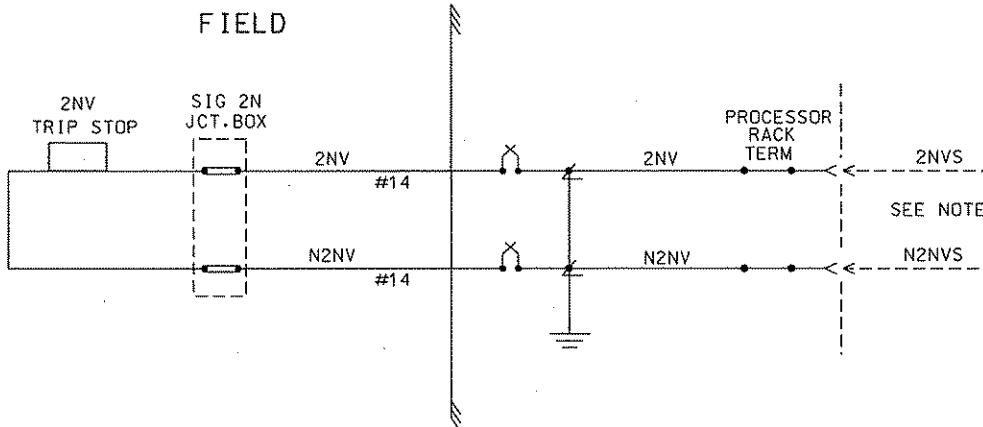
APPROVED

DATE

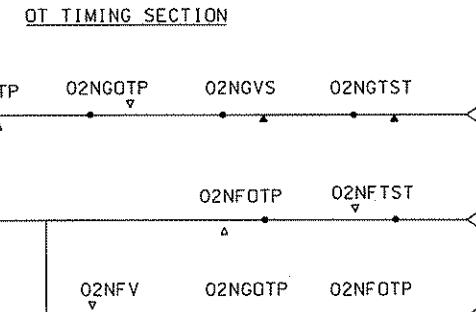
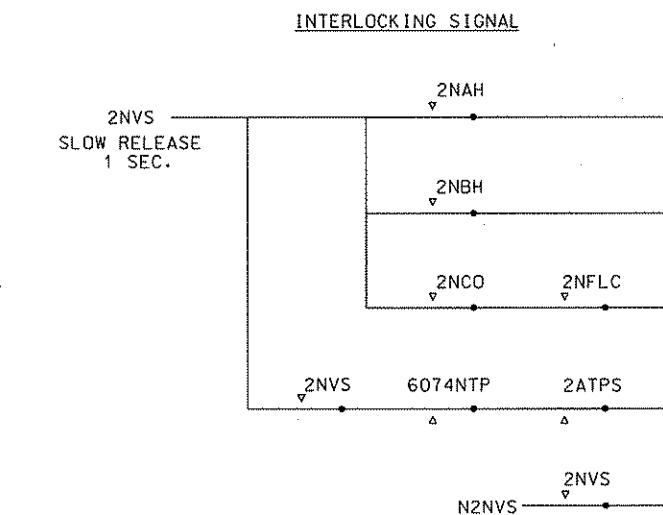


ALLEGHENY INTERLOCKING LAYOUT

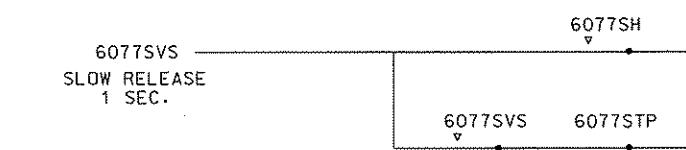
FIELD



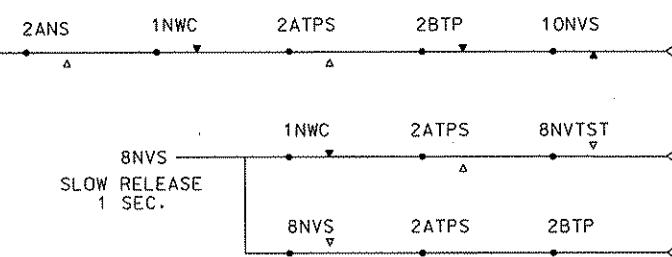
VITAL PROGRAMMABLE LOGIC



AUTO SIGNAL



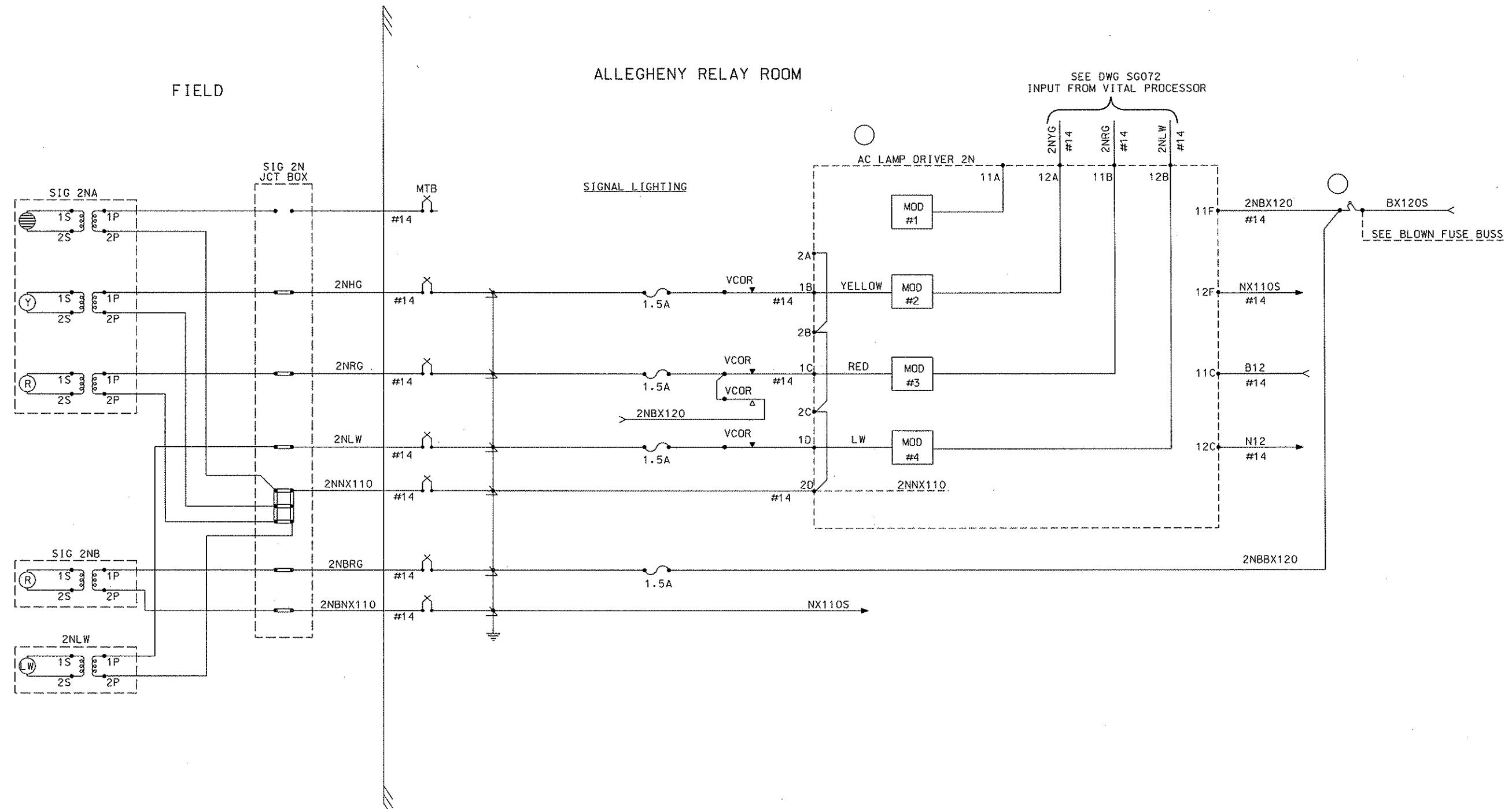
TIMING SECTION TRIPS



NOTES:

1. TRIP STOP LINE CIRCUITS SHALL BE DOUBLE BREAK VITAL PROCESSOR OUTPUTS.
2. TIME SHALL BE CALCULATED AT 10 MPH SPEED FOR EACH TIMING SECTION LENGTH.

 Gannett Fleming Transit & Rail Systems				<small>THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.</small>	 MICHAEL T. MCNAMARA OWNER No. 37700-4	DMJM HARRIS AECOM <small>FOUR GATEWAY CENTER 20TH FLOOR PITTSBURGH, PA. 15222</small>	DESIGNED SM NARANG	PORT AUTHORITY OF ALLEGHENY COUNTY <small>PITTSBURGH</small>
							DRAWN HT TRAN	
							CHECKED JF SAMEAN	NORTH SHORE CONNECTOR NSC TRAIN SYSTEM (SYSTEM WIDE) <small>TYPICAL TRIP STOP LOGIC</small>
							IN CHARGE CD JONES	
							DATE APR. 28, 2008	
							SCALE NTS	
NO. DATE	DESCRIPTION	REVISIONS		SIGNATURE	APPROVED	DATE		Port Authority
								CONTRACT NO. NSC-009
								DWG. NO. SG086 SHT. 3-71

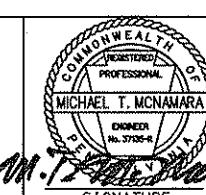


NOTES:

1. ALL WIRING #14 UNLESS OTHERWISE NOTED.
2. VCOR IS A VITAL RELAY DRIVEN BY VITAL PROCESSOR CPU IN GOOD HEALTH.

NO.	DATE	DESCRIPTION
REVISIONS		

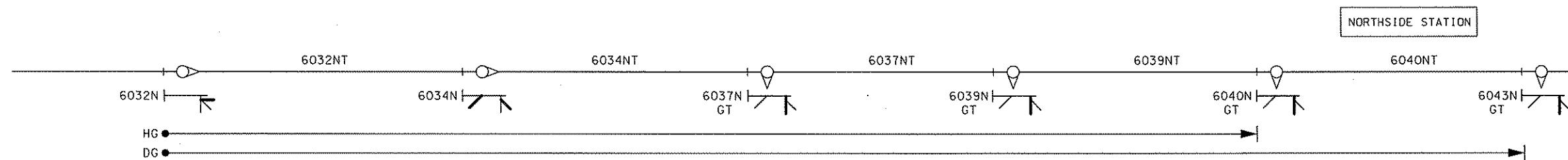
THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.



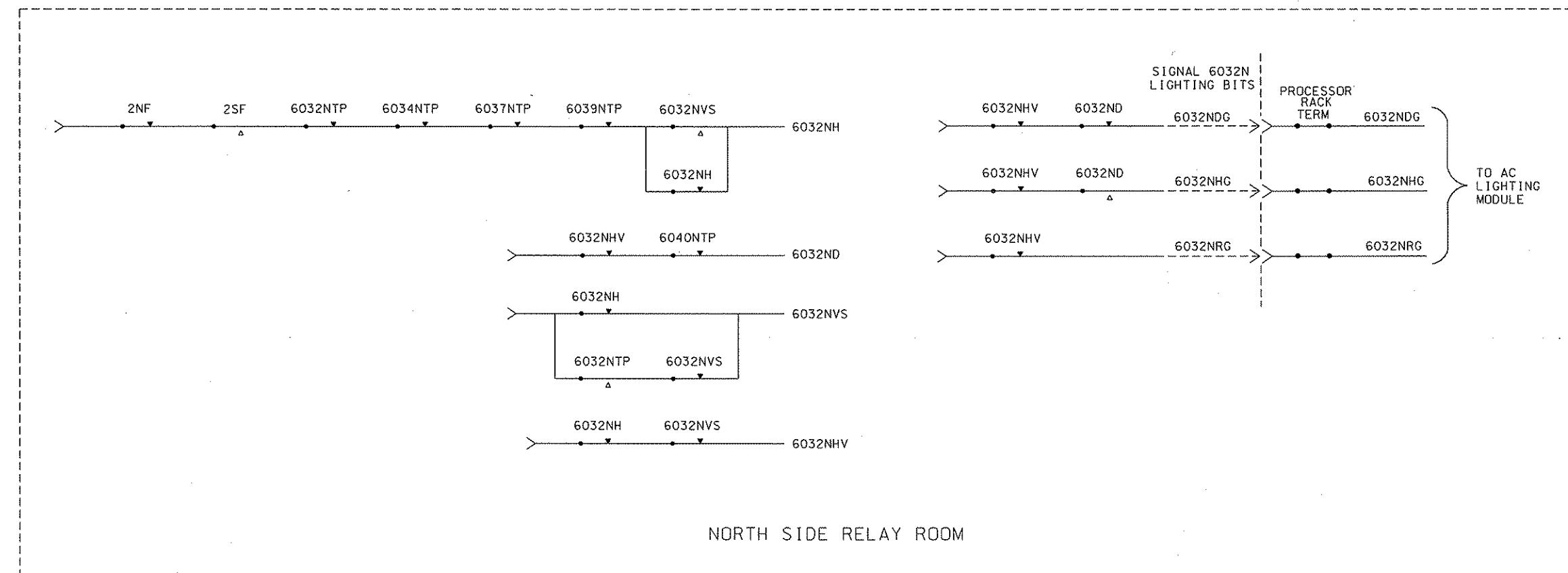
DMJM HARRIS | AECOM
FOUR GATEWAY CENTER
20TH FLOOR
PITTSBURGH, PA. 15222
SIGNATURE: *M.T. McNamara* APPROVED: *David F. Hay* DATE: *4/28/08*

DESIGNED L. NARANG
DRAWN H. TRAN
CHECKED S. M. NARANG
IN CHARGE C. D. JONES
DATE APR. 28, 2008
SCALE NTS

PORT AUTHORITY OF ALLEGHENY COUNTY
PITTSBURGH
NORTH SHORE CONNECTOR
NSC TRAIN SYSTEM (SYSTEM WIDE)
TYPICAL
2N SIGNAL LIGHTING CIRCUITS
Port Authority
CONTRACT NO. NSC-009
DWG. NO. SG088 SHT. 372



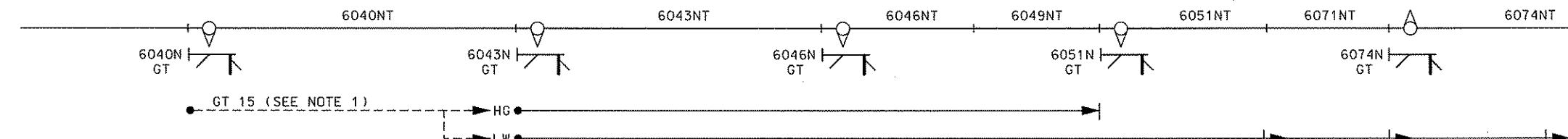
VITAL PROGRAMMABLE LOGIC



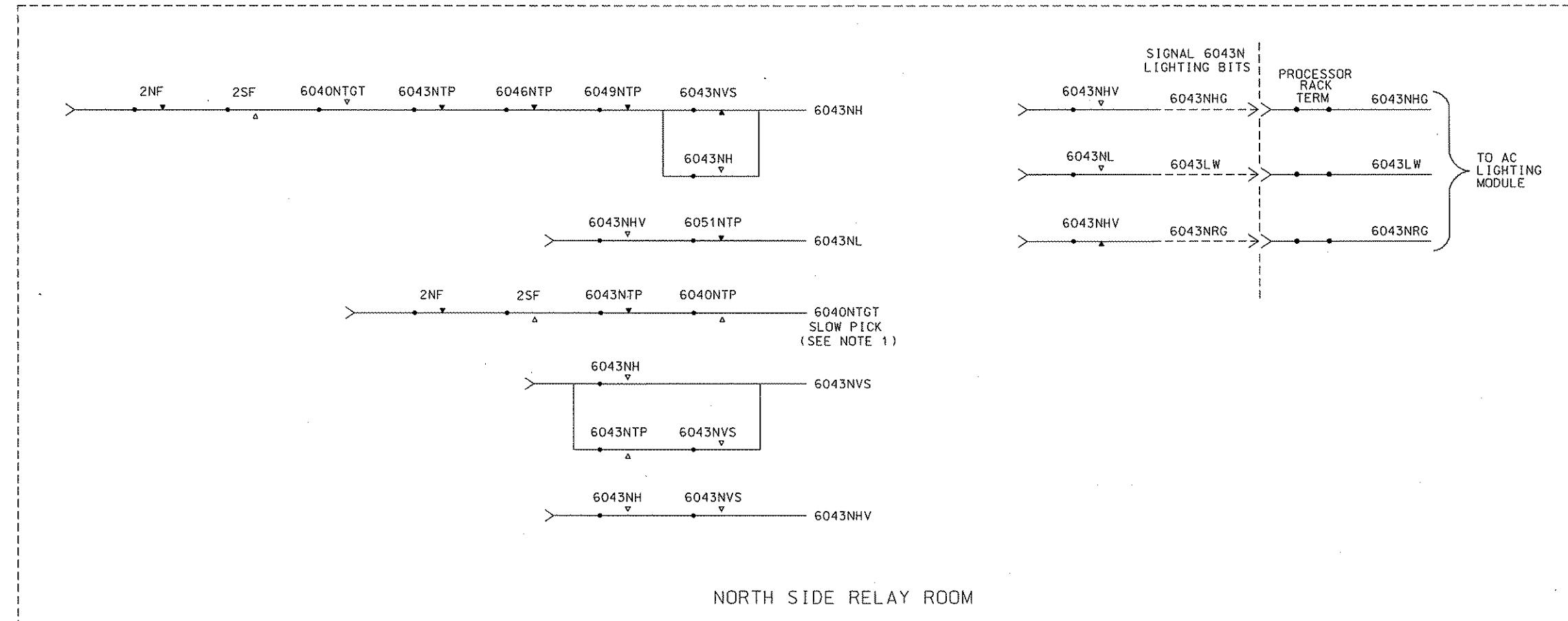
NORTH SIDE RELAY ROOM

Gannett Fleming Transit & Rail Systems			<p>THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.</p>	COMMONWEALTH REGISTERED PROFESSIONAL MICHAEL T. McNAMARA ENGINEER NO. 37054 M.T. McNamara	DMJM HARRIS AECOM FOUR GATEWAY CENTER 20TH FLOOR PITTSBURGH, PA. 15222	DESIGNED SM NARANG DRAWN HT TRAN CHECKED JF SAMEAN IN CHARGE CD JONES DATE APR. 28, 2008 SCALE NTS	PORT AUTHORITY OF ALLEGHENY COUNTY PITTSBURGH	
	NO. DATE	DESCRIPTION					NORTH SHORE CONNECTOR NSC TRAIN SYSTEM (SYSTEM WIDE) TYPICAL 6032N AUTOMATIC SIGNAL CONTROL WITHOUT TIMERS LOGIC	
		REVISIONS		David F. Henry 4/28/08	APPROVED	DATE	Port Authority	CONTRACT NO. NSC-009 DWG. NO. SG090 SHT. 373

NORTH SIDE STATION



VITAL PROGRAMMABLE LOGIC

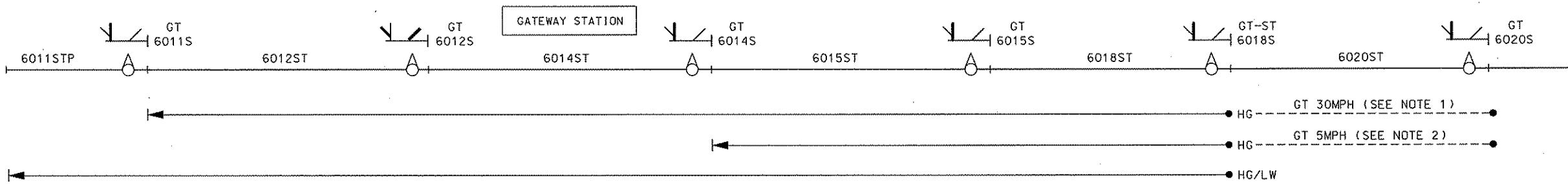


NORTH SIDE RELAY ROOM

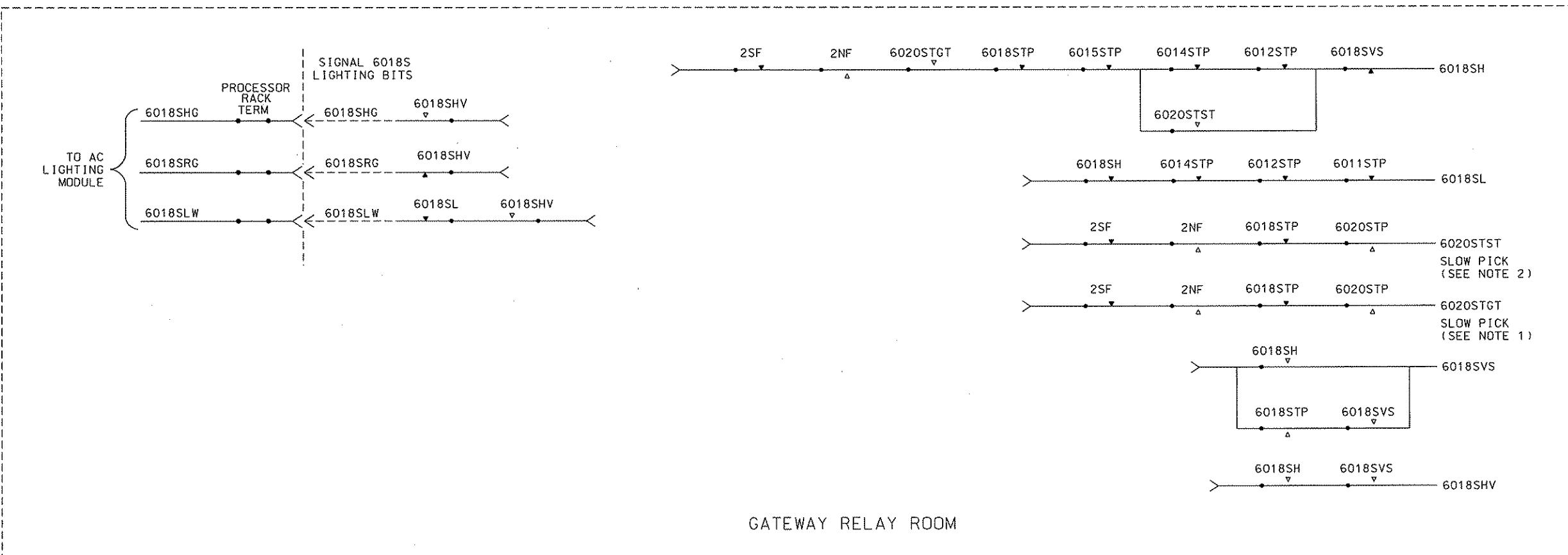
NOTE:

- CALCULATE GT TIME AT 15 MPH (22 FT/SEC) FOR THE BLOCK LENGTH 6040NT.

 Gannett Fleming Transit & Rail Systems			<small>THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.</small>	 MICHAEL T. McNAMARA OWNER McNSTUDIO	DMJM HARRIS	AECOM	DESIGNED SM NARANG DRAWN HT TRAN	PORT AUTHORITY OF ALLEGHENY COUNTY PITTSBURGH
					CHECKED JF SAMEAN IN CHARGE CD JONES DATE APR. 28, 2008	SCALE NTS	NORTH SHORE CONNECTOR NSC TRAIN SYSTEM (SYSTEM WIDE) TYPICAL 6043N AUTOMATIC SIGNAL CONTROL WITH ONE SHOT GT LOGIC	
NO. DATE	DESCRIPTION	REVISIONS		SIGNATURE <i>Michael T. McNamara</i>	APPROVED <i>David F. Henry</i> 4/28/08 DATE	Port Authority	CONTRACT NO. NSC-009 DWG. NO. SG091 SHT. 374	



VITAL PROGRAMMABLE LOGIC



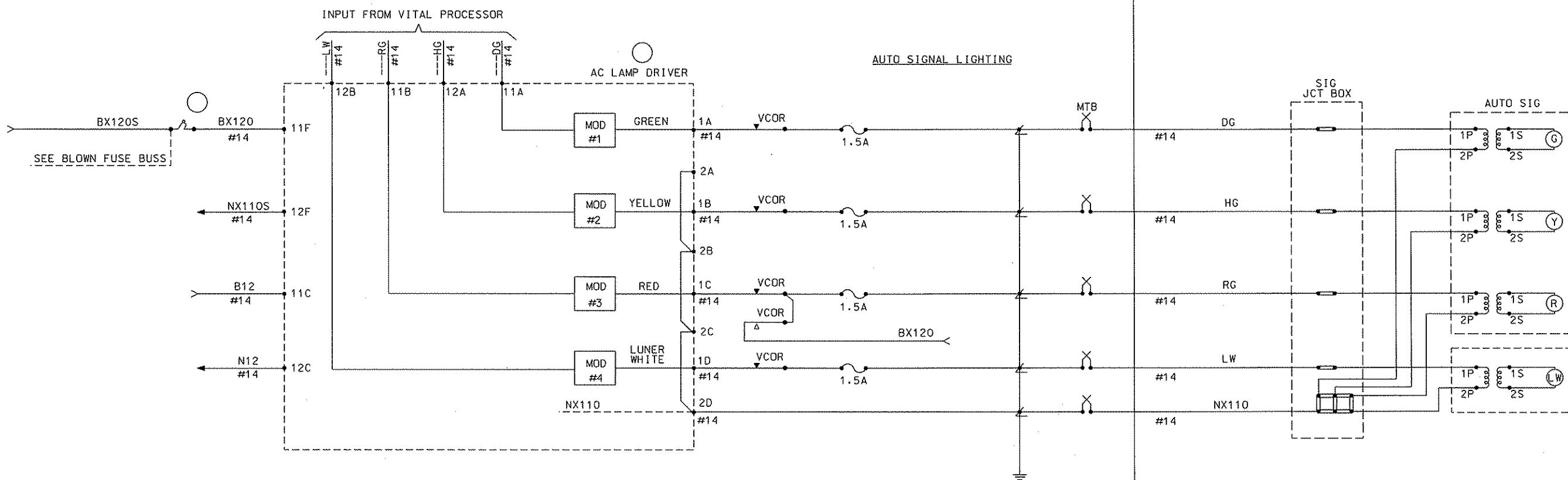
NOTES:

- CALCULATE GT TIME AT 25 MPH (36.6 FT/SEC)
FOR THE BLOCK LENGTH 6020ST.
- CALCULATE ST TIME AT 25 MPH (7.3 FT/SEC)
FOR THE BLOCK LENGTH 6020ST.

 Gannett Fleming Transit & Rail Systems				THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.	DMJM HARRIS AECOM	DESIGNED SM NARANG DRAWN HT TRAN	PORT AUTHORITY OF ALLEGHENY COUNTY PITTSBURGH	
								CHECKED JF SAMEAN IN CHARGE CD JONES DATE APR. 28, 2008
NO. DATE	DESCRIPTION	REVISIONS		 MICHAEL T. McNAMARA OWNER REG. NO. 3705-R SIGNATURE	SCALE NTS	6018S AUTOMATIC SIGNAL CONTROL WITH ONE SHOT GT & ST LOGIC		
				D. T. [Signature] 4/28/08 APPROVED DATE	Port Authority	CONTRACT NO. NSC-009 DWG. NO. SG092 SHT. 375		

NORTH SHORE RELAY ROOM

FIELD

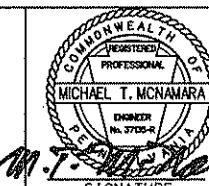


NOTE:

1. ALL WIRING #14 UNLESS OTHERWISE NOTED.
 2. VCOR IS A VITAL CUT OFF RELAY DRIVEN BY VITAL PROCESSOR CPU IN GOOD HEALTH.



THE PREPARATION OF THIS DOCUMENT HAS BEEN
FINANCED IN PART THROUGH A GRANT FROM THE
FEDERAL TRANSIT ADMINISTRATION, U.S.
DEPARTMENT OF TRANSPORTATION, UNDER THE
URBAN MASS TRANSPORTATION ACT OF 1964,
AS AMENDED, FOR THE PORT AUTHORITY OF
ALLEGHENY COUNTY, PENNSYLVANIA.



DMJM HARRIS | **AECOM**
FOUR GATEWAY CENTER
20TH FLOOR
PITTSBURGH, PA. 15222
David & Henry 4/28/08
APPROVED DATE

PITTSBURGH

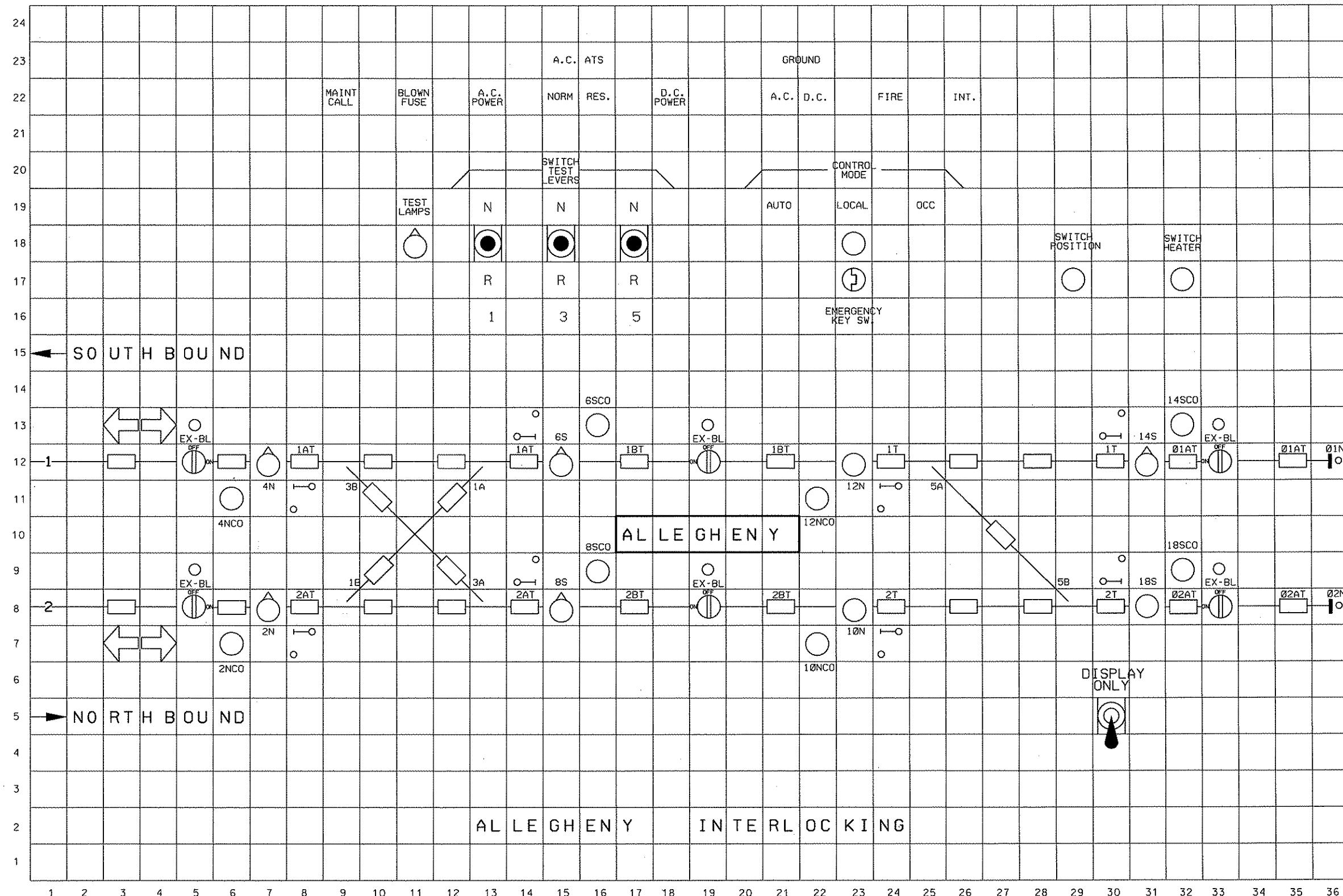
PENNSYLVANIA

NORTH SHORE CONNECTOR

NSC TRAIN SYSTEM (SYSTEM WIDE)

TYPICAL

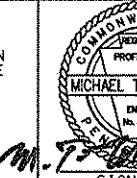
AUTOMATIC SIGNAL LIGHTING CIRCUITS



 Gannett Fleming Transit & Rail Systems				<p>THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.</p> <p>NO. DATE</p> <p>DESCRIPTION</p> <p>REVISIONS</p>	 COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ENGINEER MICHAEL T. McNAMARA LICENSE NO. 3735-R DRAFTED APRIL 28, 2008 APPROVED APRIL 28, 2008 SIGNATURE M.T. McNamara	DMJM HARRIS AECOM FOUR GATEWAY CENTER 20TH FLOOR PITTSBURGH, PA. 15222 David J. Flory 4/28/08 APPROVED DATE	DESIGNED	SM NARANG	PORT AUTHORITY OF ALLEGHENY COUNTY PITTSBURGH NORTH SHORE CONNECTOR NSC TRAIN SYSTEM (SYSTEM WIDE) TYPICAL LOCAL CONTROL PANEL - FACEPLATE
	DRAWN	HT TRAN							
	CHECKED	JF SAMEAN							
	IN CHARGE	CD JONES							
	DATE	APR. 28, 2008							
	SCALE	NTS							
	 Port Authority								
	CONTRACT NO.	NSC-009							
	DWG. NO.	SG100							
	SHT.	377							



THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.



DMJM HARRIS | AECO

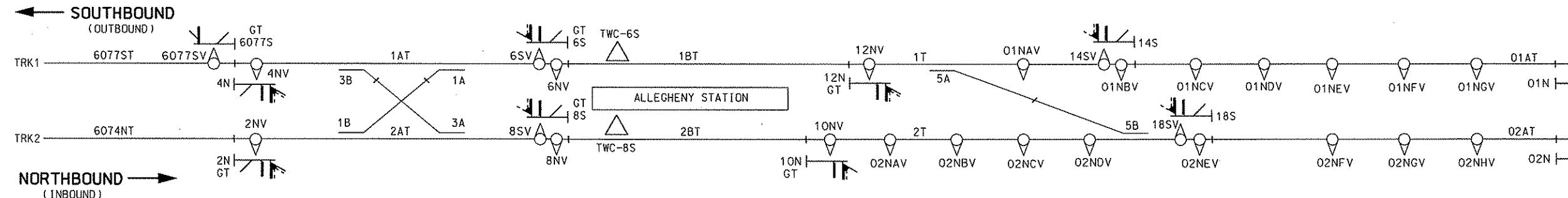
FOUR GATEWAY CENTER
20TH FLOOR
PITTSBURGH, PA. 15222

Daniel J. Flaherty 4/28/01

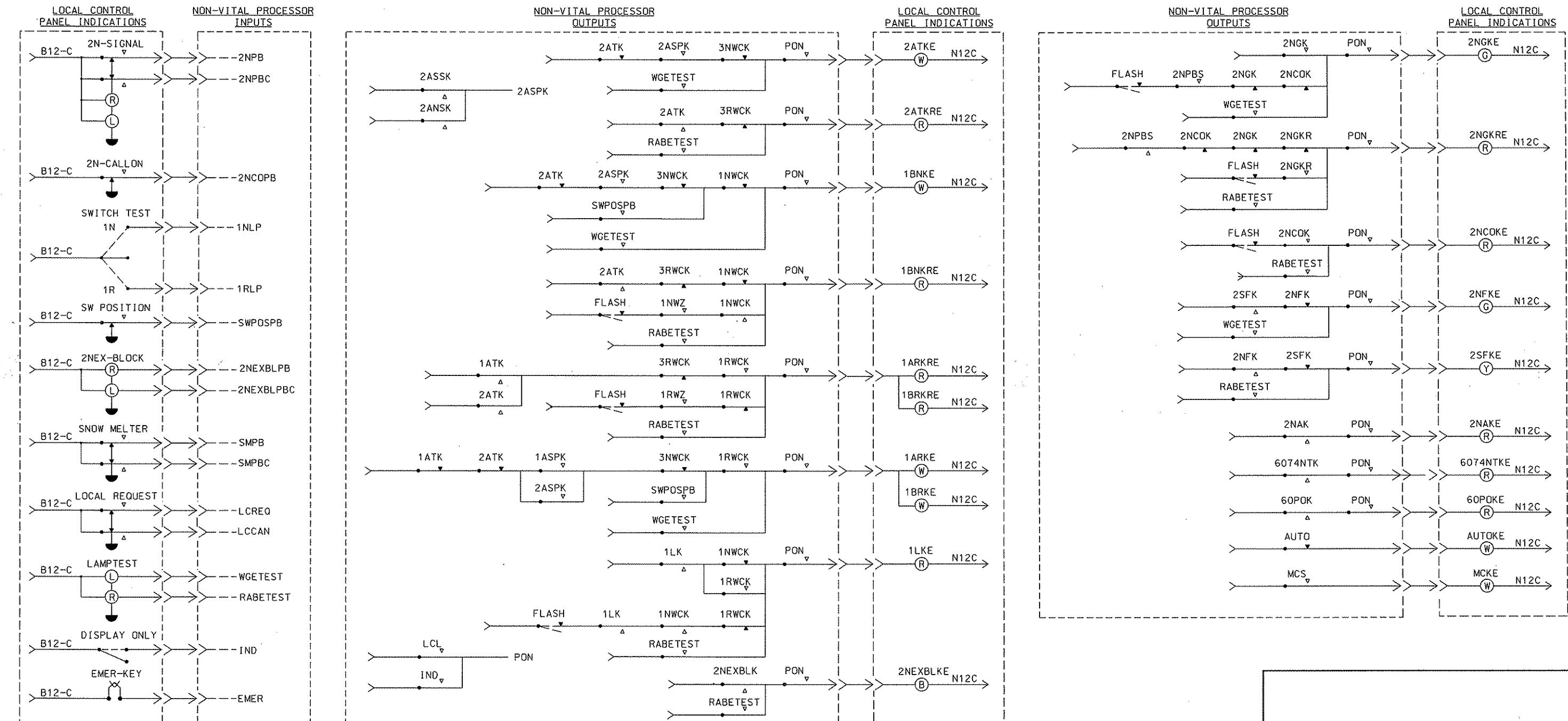
APPROVED DATE

M DESIGNED SM NAP
DRAWN HT
CHECKED JF SA
IN CHARGE CD JU
DATE APR. 28, 1988
SCALE

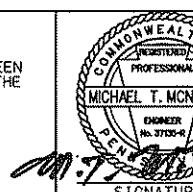
PITTSBURGH		PENNSYLVANIA
NORTH SHORE CONNECTOR NSC TRAIN SYSTEM (SYSTEM WIDE) TYPICAL		
LOCAL CONTROL PANEL - NOMENCLATURE		
 <small>controlling project site</small>	CONTRACT NO.	NSC-009
	DWG. NO.	SG101



ALLEGHENY INTERLOCKING LAYOUT



THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.



2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

2008

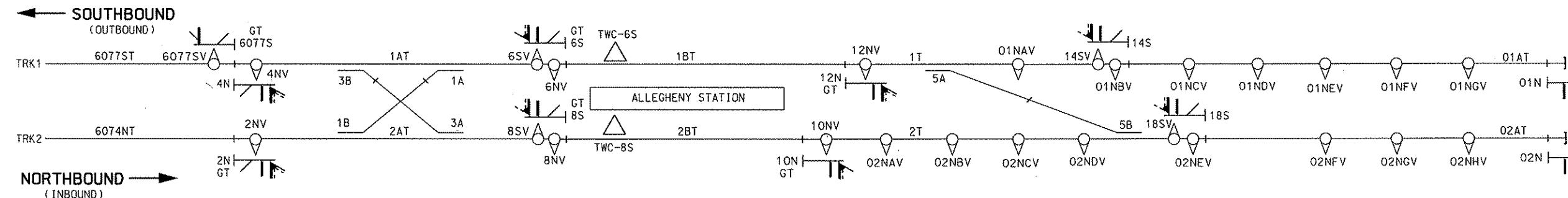
2008

2008

2008

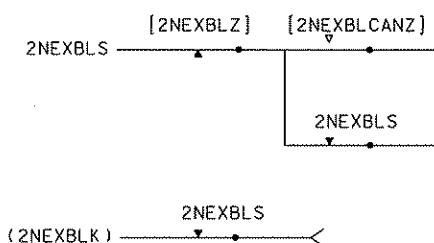
2008

2008

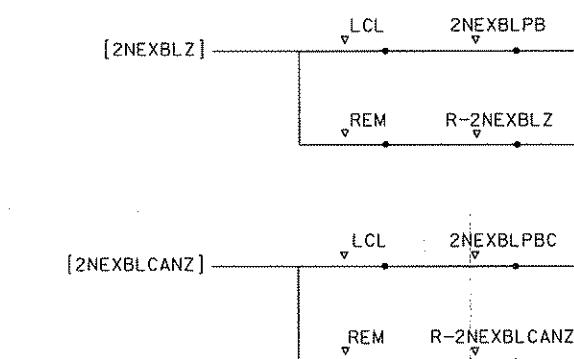


ALLEGHENY INTERLOCKING LAYOUT

VITAL PROGRAMMABLE LOGIC

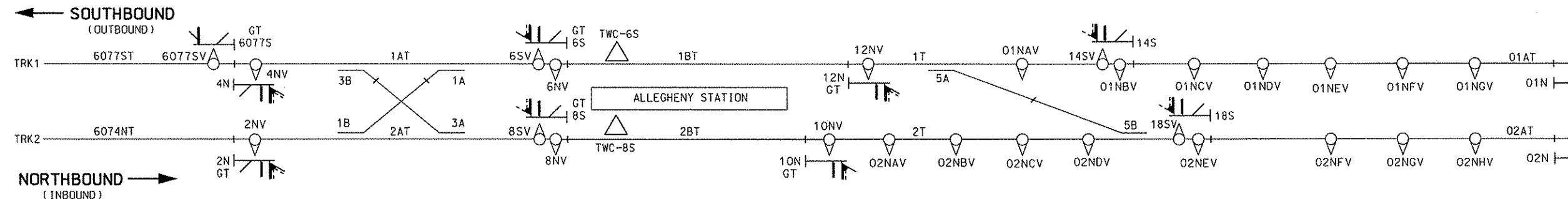


NON-VITAL PROGRAMMABLE LOGIC



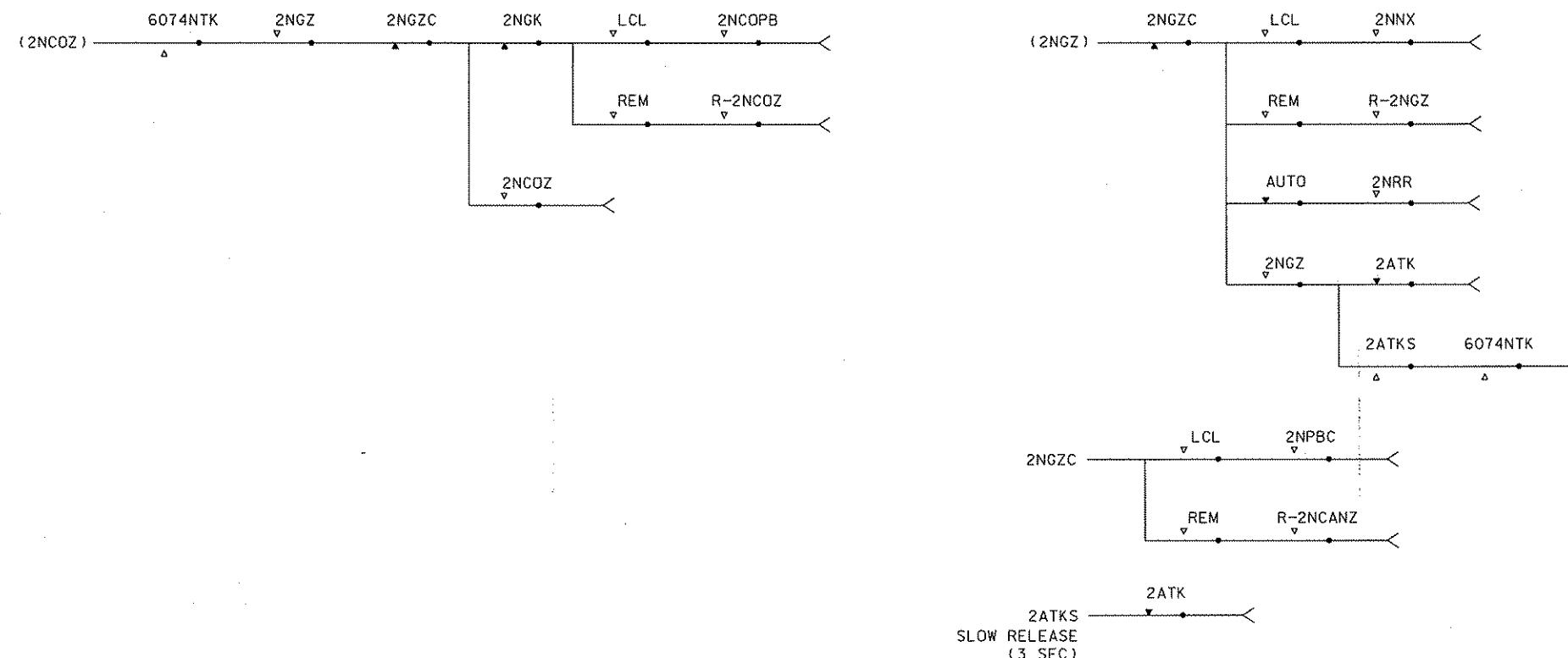
[] = SERIAL BITS TO VITAL PROCESSOR.
 () = SERIAL BITS TO NON-VITAL PROCESSOR.

 Gannett Fleming Transit & Rail Systems				THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.	 REGISTERED PROFESSIONAL ENGINEER MICHAEL T. McNAMARA OWNER NO. 37054	DMJM HARRIS AECOM FOUR GATEWAY CENTER 20TH FLOOR PITTSBURGH, PA. 15222	DESIGNED	SM NARANG	PORT AUTHORITY OF ALLEGHENY COUNTY PITTSBURGH NORTH SHORE CONNECTOR NSC TRAIN SYSTEM (SYSTEM WIDE) TYPICAL EXIT BLOCK LOGIC
							DRAWN	HT TRAN	
			SIGNATURE	 <i>Michael T. McNamara</i> 4/28/08 APPROVED DATE		IN CHARGE	CD JONES	CONTRACT NO.	NSC-009
NO. DATE	DESCRIPTION	REVISIONS				DATE	APR. 28, 2008	DWG. NO.	SG106



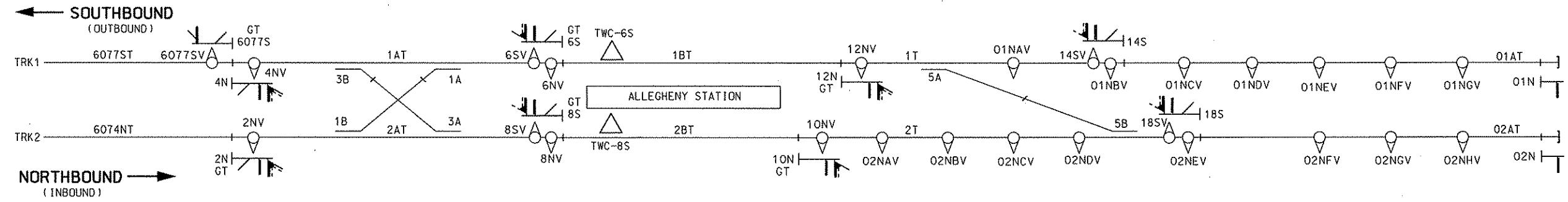
ALLEGHENY INTERLOCKING LAYOUT

NON-VITAL PROGRAMMABLE LOGIC



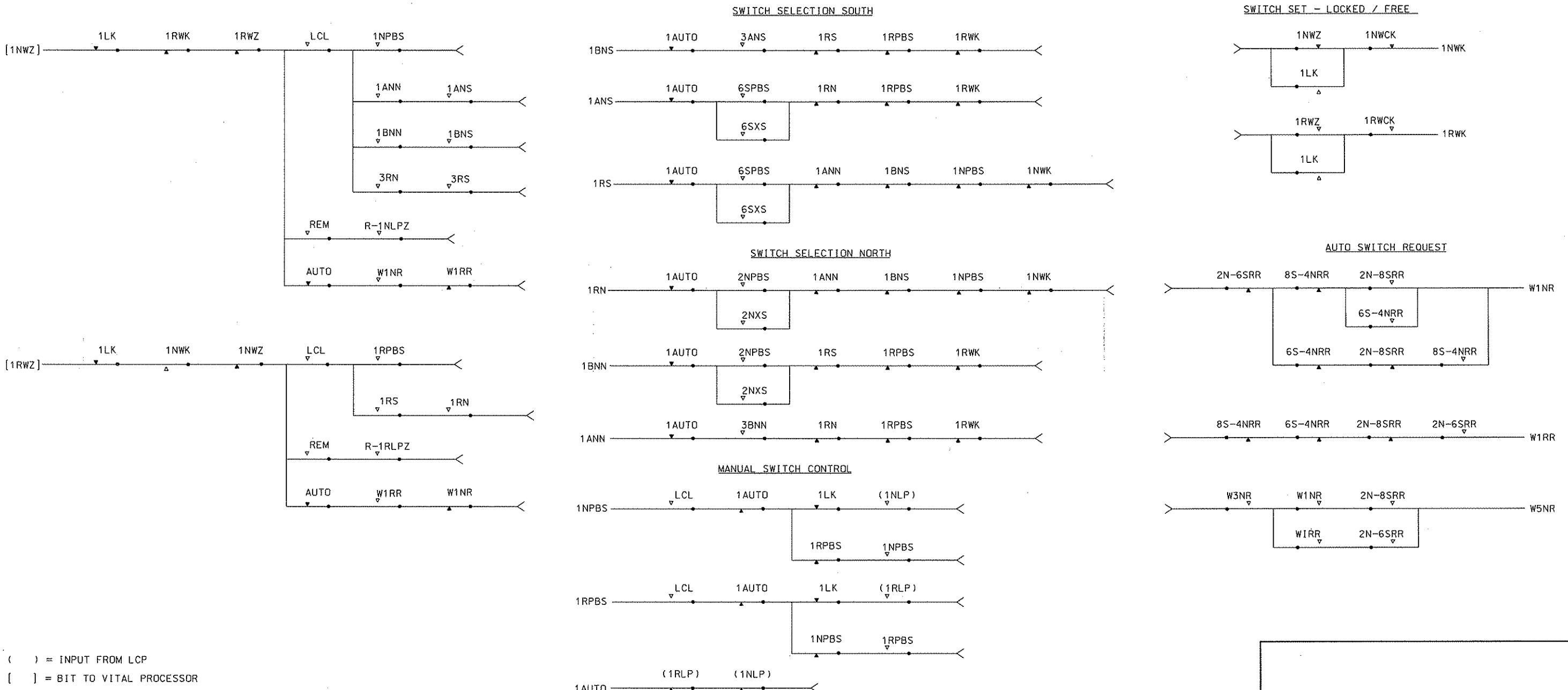
() = SERIAL BITS TO VITAL PROCESSOR.

 Gannett Fleming Transit & Rail Systems				<p>THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.</p>	 MICHAEL T. McNAMARA OIGERER No. 3705-0	DMJM HARRIS AECOM FOUR GATEWAY CENTER 20TH FLOOR PITTSBURGH, PA. 15222	DESIGNED SM NARANG DRAWN HT TRAN CHECKED JF SAMEAN IN CHARGE CO JONES DATE APR. 28, 2008 SCALE NTS	PORT AUTHORITY OF ALLEGHENY COUNTY PITTSBURGH NORTH SHORE CONNECTOR NSC TRAIN SYSTEM (SYSTEM WIDE) TYPICAL SIGNAL REQUEST LOGIC	
								 Port Authority CONTRACT NO. NSC-009 DWG. NO. SG107 SHT. 381	



ALLEGHENY INTERLOCKING LAYO

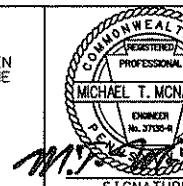
NON-VITAL PROGRAMMABLE LOGIC



() = INPUT FROM LCP
[] = BIT TO VITAL PROCESSOR



THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.



DMJM HARRIS AECO
FOUR GATEWAY CENTER
20TH FLOOR
PITTSBURGH, PA. 15222
Daniel P. Harrington 4/28/01
APPROVED DATE

M 0
D
C
I
D
S

DESIGN
DRAWN
CHECKED
IN CHARGE
DATE
CALENDAR

NED
ED
ARGE
APR

SM I
H
JF
CD
• 28

NARAN
T TRA
SAME
JONE
• 200
NT

NG
AN
AN
ES
08
TS

卷之三

PITTSE

ART
BURGH
AUT
Por
Aut

AUT

THOUGHTS

RITY
NORTH
RAIN
NCE B

7 OF
10
SEARCH
SYSTEM
TYPE
EXIT L

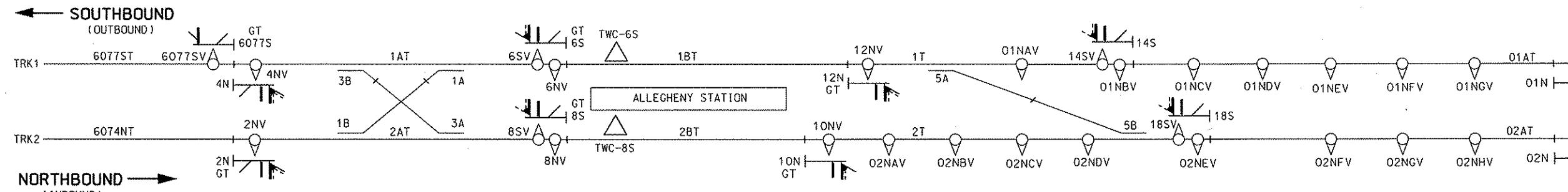
F AL
ORE CO
EM (S
PICAL
OGIC

LEG
ONNECT
SYSTEM
— SW
TRACT
2 NO

PORT AUTHORITY OF ALLEGHENY COUNTY
 PITTSBURGH PITTSGRTH, PA 15222
 PENNSYLVANIA

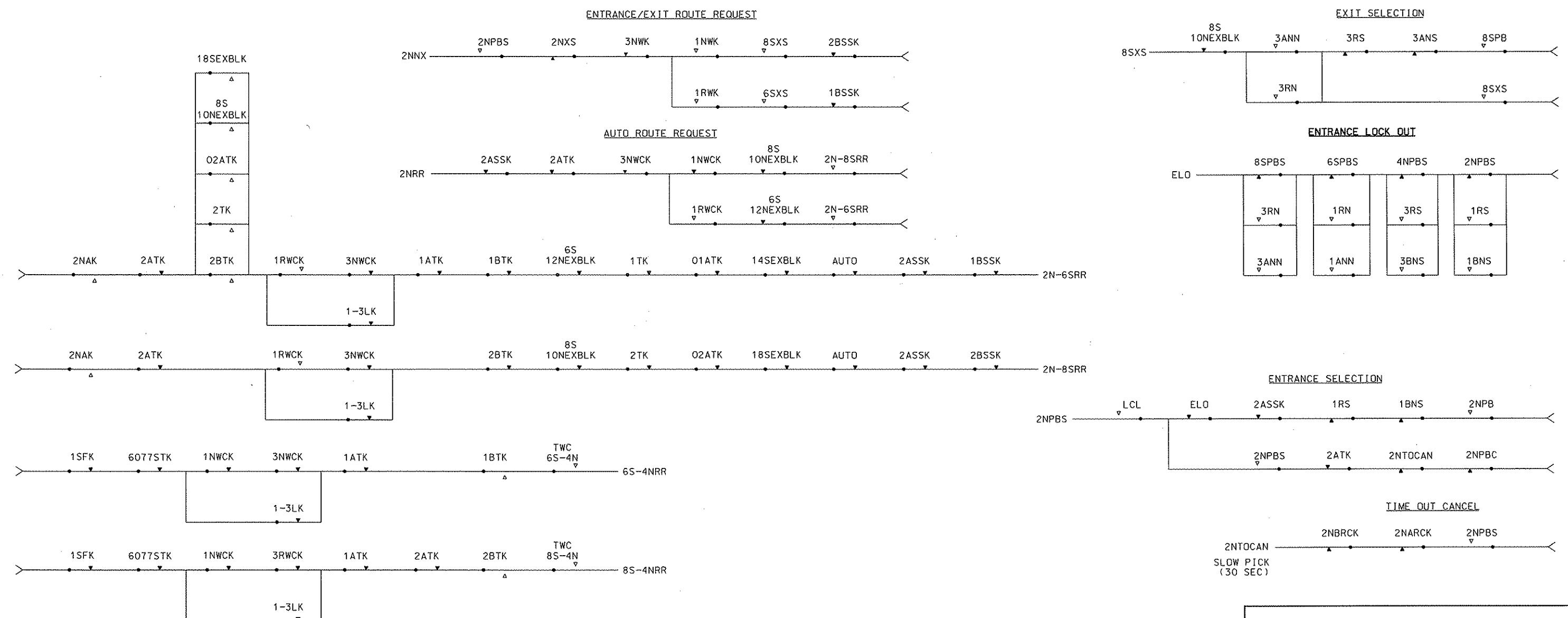
NORTH SHORE CONNECTOR
NSC TRAIN SYSTEM (SYSTEM WIDE)
TYPICAL

AUTO / ENTRANCE EXIT LOGIC – SWITCH SELECTION

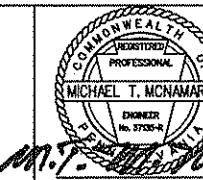


ALLEGHENY INTERLOCKING LAYO

NON-VITAL PROGRAMMABLE LOGIC



THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.



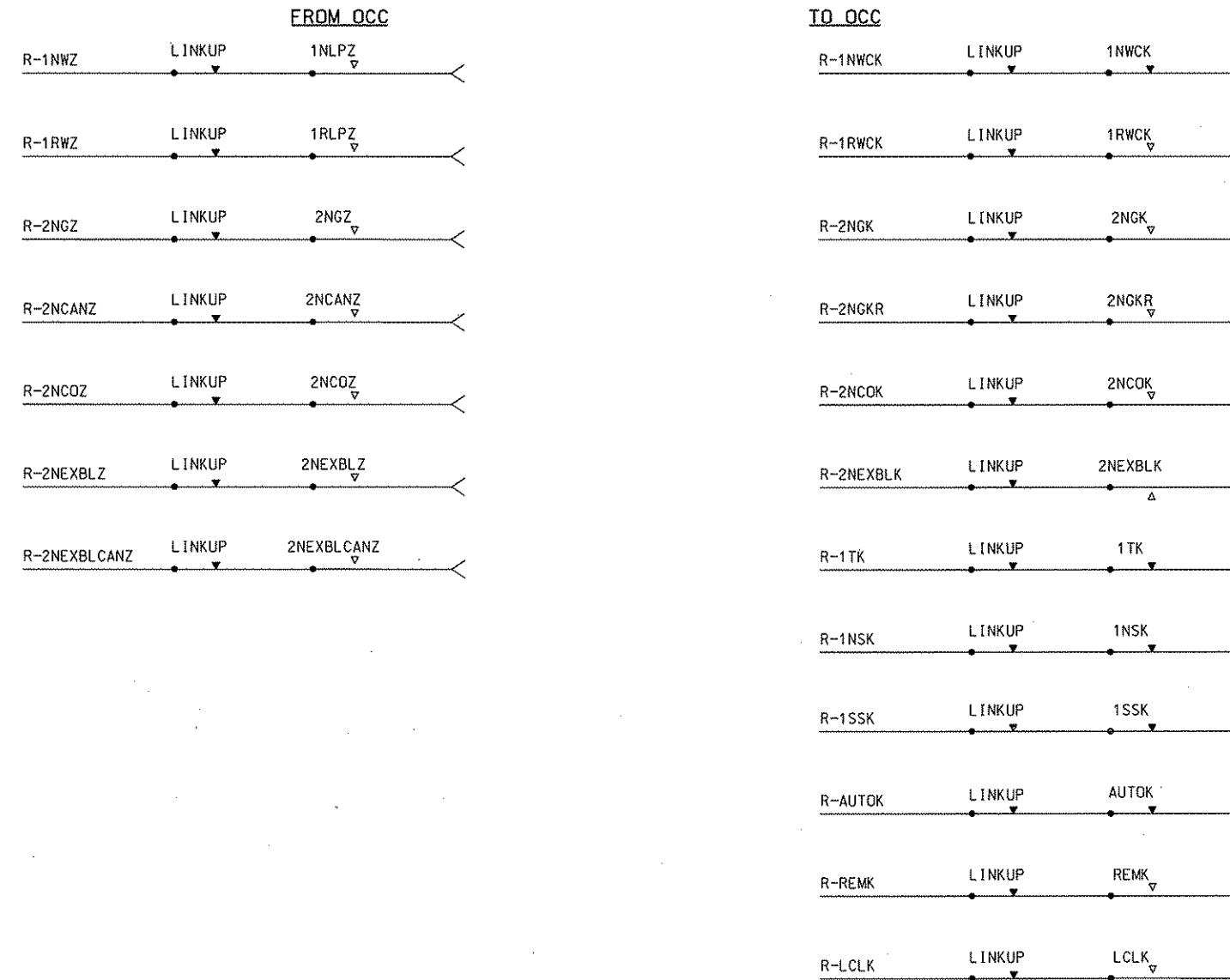
DMJM HARRIS | AECO
FOUR GATEWAY CENTER
20TH FLOOR
PITTSBURGH, PA. 15222

DESIGNED	SM NARANG
DRAWN	HT TRAN
CHECKED	JF SAMEAN
IN CHARGE	CD JONES
DATE	APR. 28, 2008
SCALE	NTS

PITTSBURGH		PENNSYLVANIA
NORTH SHORE CONNECTOR		
NSC TRAIN SYSTEM (SYSTEM WIDE)		
TYPICAL		
AUTO / ENTRANCE EXIT LOGIC - ROUTE SELECTION		
Port Authority	CONTRACT NO.	NSC-009
	2010	2

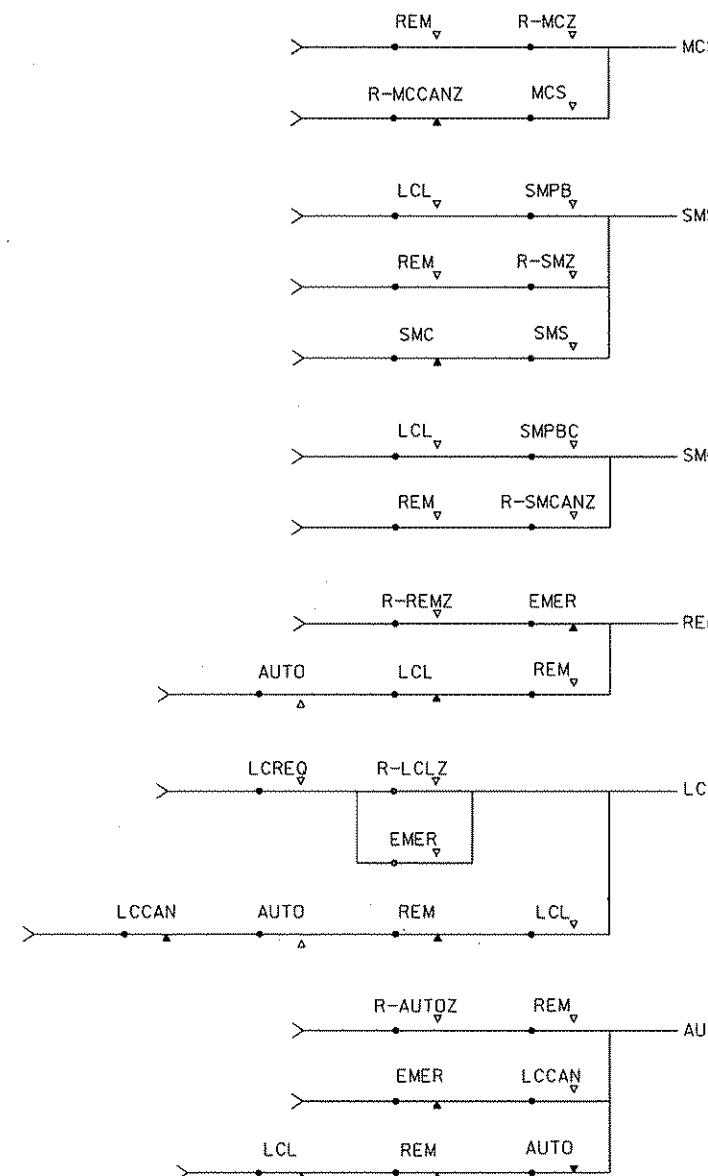
 Gannett Fleming
Transit & Rail Systems

NON-VITAL PROGRAMMABLE LOGIC

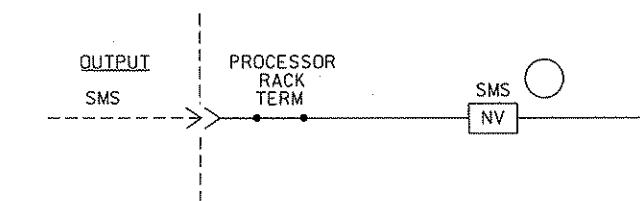


Gannett Fleming Transit & Rail Systems				<p>THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.</p> <p>NO. DATE DESCRIPTION</p> <p>REVISIONS</p>	<p>MICHAEL T. McNAMARA REGISTRATION NO. 37332</p> <p>SIGNATURE</p> <p>David J. Hays 4/28/08</p>	<p>DESIGNED SM NARANG DRAWN HT TRAN</p> <p>CHECKED JF SAMEAN IN CHARGE CD JONES</p> <p>DATE APR. 28, 2008</p> <p>SCALE NTS</p>	<p>PORT AUTHORITY OF ALLEGHENY COUNTY PITTSBURGH</p> <p>NORTH SHORE CONNECTOR NSC TRAIN SYSTEM (SYSTEM WIDE) TYPICAL OCC CONTROLS & INDICATIONS</p> <p>Port Authority</p>
	DATE	DESCRIPTION					
							DWG. NO. SG16 SHT. 384

NON VITAL PROGRAMMABLE LOGIC



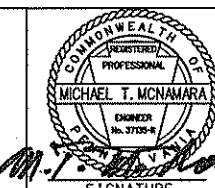
ALLEGHENY RELAY ROOM



Gannett Fleming
Transit & Rail Systems

NO.	DATE	DESCRIPTION
REVISONS		

THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.



DMJM HARRIS | AECOM
FOUR GATEWAY CENTER
20TH FLOOR
PITTSBURGH, PA. 15222
CHECKED JF SAMEAN
IN CHARGE CD JONES
DATE APR. 28, 2008
SIGNATURE *[Signature]* APPROVED DATE *[Signature]*

PORT AUTHORITY OF ALLEGHENY COUNTY
PITTSBURGH
NORTH SHORE CONNECTOR
NSC TRAIN SYSTEM (SYSTEM WIDE)
TYPICAL
MISC. ALARMS CIRCUITS & CONTROLS LOGIC
Port Authority
CONTRACT NO. NSC-009
DWG. NO. SG117 SHT. 385

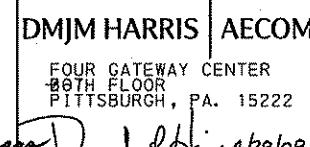
ALLEGHENY CODE CHART

CONTROL BITS

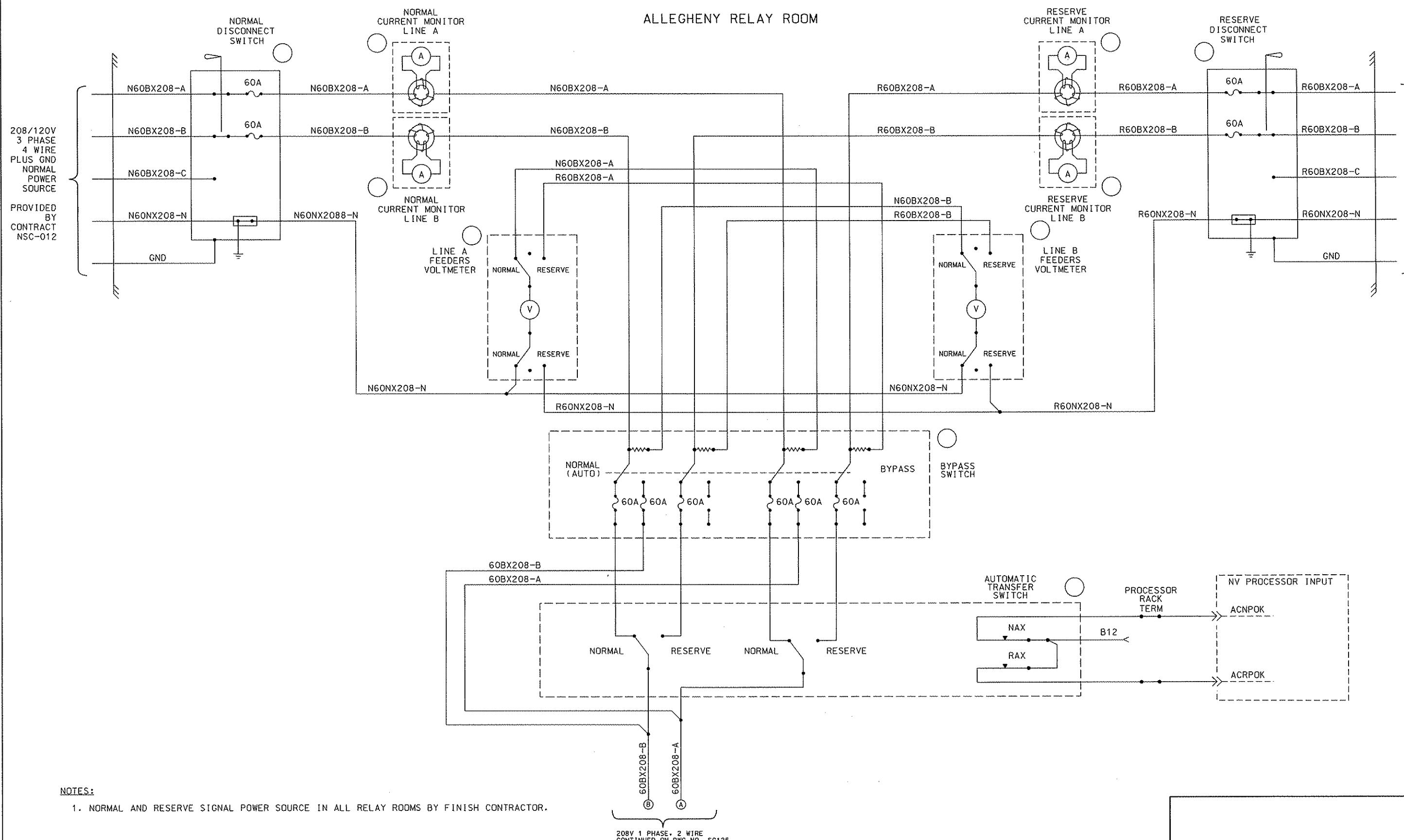
WORD	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
0	1NLPZ	1RLPZ	3NLPZ	3RLPZ	5NLPZ	5RLPZ										
1	2NGZ	2NCANZ	2NCOZ		4NGZ	4NCANZ	4NCOZ	10NGZ	10NCANZ	10NCOZ	12NGZ	12NCANZ	12NCOZ			
2	6SGZ	6SCANZ	6SCOZ		8SGZ	8SCANZ		8SCOZ		14SGZ	14SCANZ	14SCOZ		18SGZ	18SCANZ	18SCOZ
3	2NEXBLZ	2NEXBLCANZ	4NEXBLZ	4NEXBLCANZ	6S-12N EXBLZ	6S-12N EXBLCANZ	8S-10N EXBLZ	8S-10N EXBLCANZ	14SEXBLZ	14SEXBLCANZ	18SEXBLZ	18SEXBLCANZ				
4	SMZ	SMCANZ	MCZ	MCCANZ	AUTOZ	REMZ	LCLZ									
5																
6																
7																
8																
9																
10																
11																
12																
13																
14																
15																

INDICATION BITS

WORD	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
0	1NWCK	1RWCK	1LK	3NWCK	3RWCK	3LK	5NWCK	5RWCK	5LK							
1	2NGK	2NGKR	2NCOK		4NGK	4NGKR	4NCOK	10NGK	10NGKR	10NCOK	12NGK	12NGKR	12NCOK			
2	6SGK	6SGKR	6SCOK		8SGK	8SGKR	8SCOK		14SGK	14SGKR	14SCOK		18SGK	18SGKR	18SCOK	
3	1TK	1ATK	1BTK		2TK	2ATK	2BTK	01ATK		02ATK		6074NTK	6071NTK	6077STK	6073STK	
4	1NSK	1SSK	1ANSK	1ASSK	1BNSK	1BSSK	01ANSK		2NSK	2SSK	2ANSK	2ASSK	2BNSK	2BSSK	02ANSK	
5	1NFK	1SFK	2NFK	2SFK												
6	2NEXBLK	4NEXBLK	6S-12N EXBLK	8S-10N EXBLK	14SEXBLK	18SEXBLK										
7	REMK	LCLK	AUTOK	FIREK	INTK	BFK	SMK	MCK								
8	ACPOK	DCPOK	ACGDK	DCGDK												
9																
10																
11																
12																
13																
14																
15																

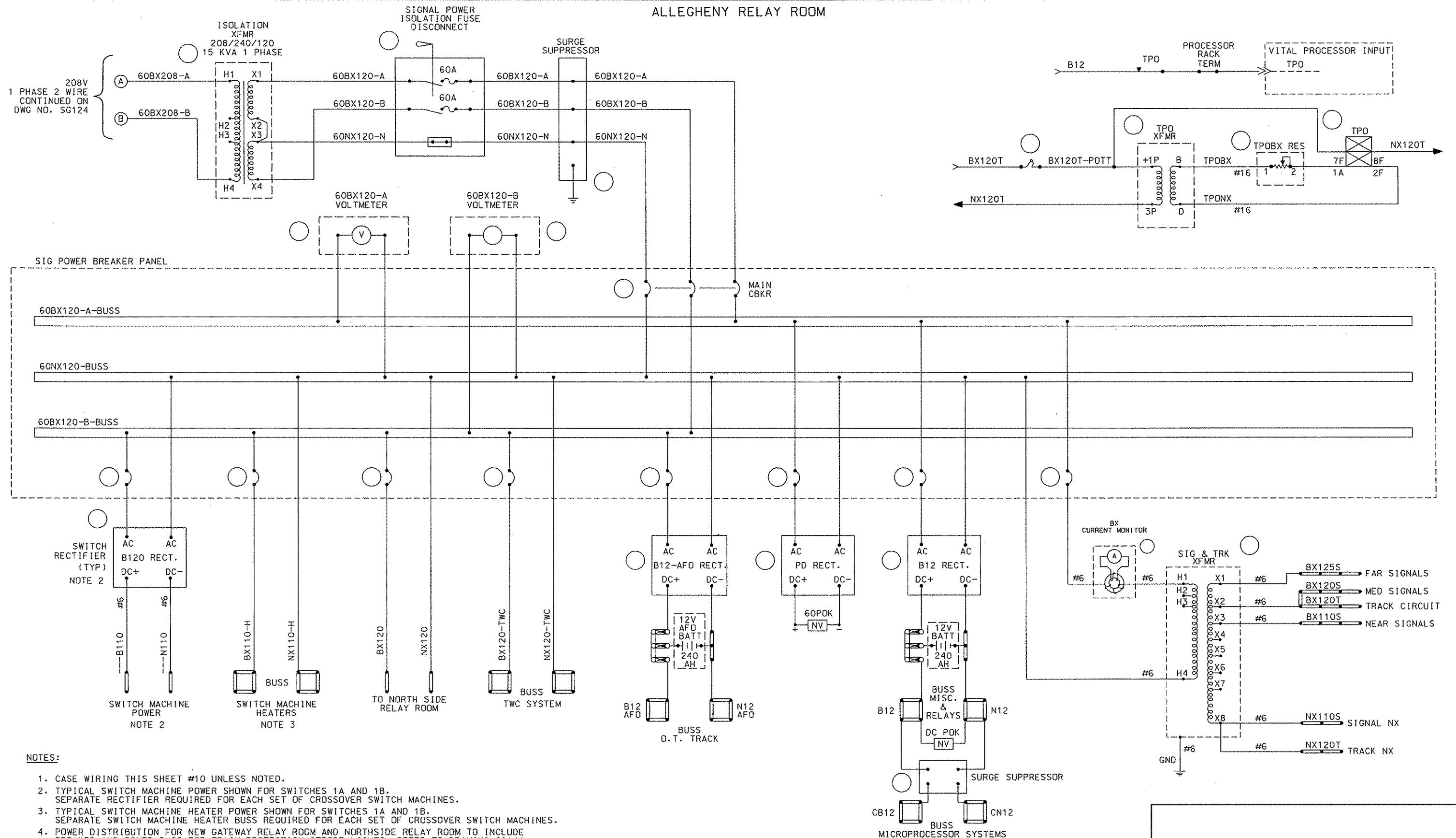
 <p>Gannett Fleming Transit & Rail Systems</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">NO.</td> <td style="width: 50%;">DATE</td> </tr> <tr> <td colspan="2" style="text-align: center;">DESCRIPTION</td> </tr> <tr> <td colspan="2" style="text-align: center;">REVISIONS</td> </tr> </table>	NO.	DATE	DESCRIPTION		REVISIONS		 <p>THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.</p>	<p>DESIGNED BY SM NARANG DRAWN BY HT TRAN</p> <p>CHECKED BY JF SAMEAN IN CHARGE BY CD JONES</p> <p>DATE APR. 28, 2008 SCALE NTS</p> <p>SIGNATURE  APPROVED  DATE 4/28/08</p>	<p>PORT AUTHORITY OF ALLEGHENY COUNTY PITTSBURGH</p> <p>NORTH SHORE CONNECTOR NSC TRAIN SYSTEM (SYSTEM WIDE) ALLEGHENY INTERLOCKING OCC CODE & FUNCTION ASSIGNMENT</p>	
		NO.	DATE								
DESCRIPTION											
REVISIONS											
<p>CONTRACT NO. NSC-009 DWG. NO. SG118 SHT. 386</p>											

ALLEGHENY RELAY ROOM



				DMJM HARRIS AECOM	DESIGNED JC TRAUM	PORT AUTHORITY OF ALLEGHENY COUNTY PITTSBURGH
					DRAWN JC TRAUM	
					CHECKED JF SAMEAN	NORTH SHORE CONNECTOR NSC TRAIN SYSTEM (SYSTEM WIDE) TYPICAL SIGNAL POWER DISTRIBUTION CIRCUITS
					IN CHARGE CD JONES	
					DATE APR. 28, 2008	
	NO. DATE	DESCRIPTION		SIGNATURE	SCALE NTS	 Port Authority CONTRACT NO. NSC-009 DWG. NO. SG124 SHT. 387
		REVISIONS		APPROVED	DATE	

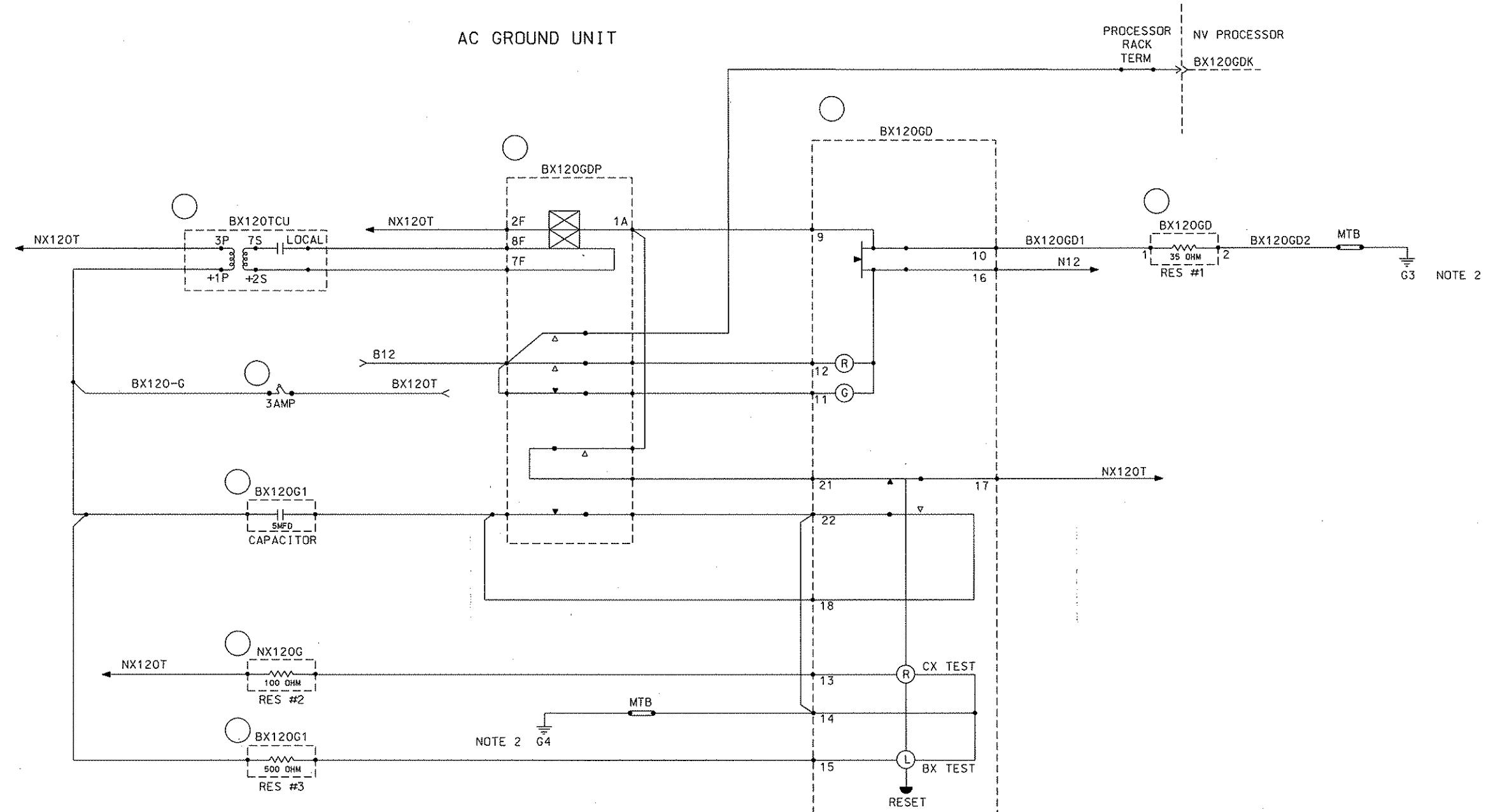
ALLEGHENY RELAY ROOM



Gannett Fleming Transit & Rail Systems			THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.	DMJM HARRIS	AECOM	DESIGNED	J.C. TRAUM	PORT AUTHORITY OF ALLEGHENY COUNTY	
						DRAWN	J.C. TRAUM	PITTSTON	
						CHECKED	J.F. SAMEAN	NORTH SHORE CONNECTOR	
						IN CHARGE	C.D. JONES	NSC TRAIN SYSTEM (SYSTEM WIDE)	
						DATE	APR. 28, 2008	TYPICAL	
						SCALE	NTS	SIGNAL POWER DISTRIBUTION CIRCUITS	
						SIGNATURE	<i>David F. Henry 4/28/08</i>	Port Authority	
								CONTRACT NO.	NSC-009
								DWG. NO.	SG125
								SHT.	388

ALLEGHENY RELAY ROOM

AC GROUND UNIT

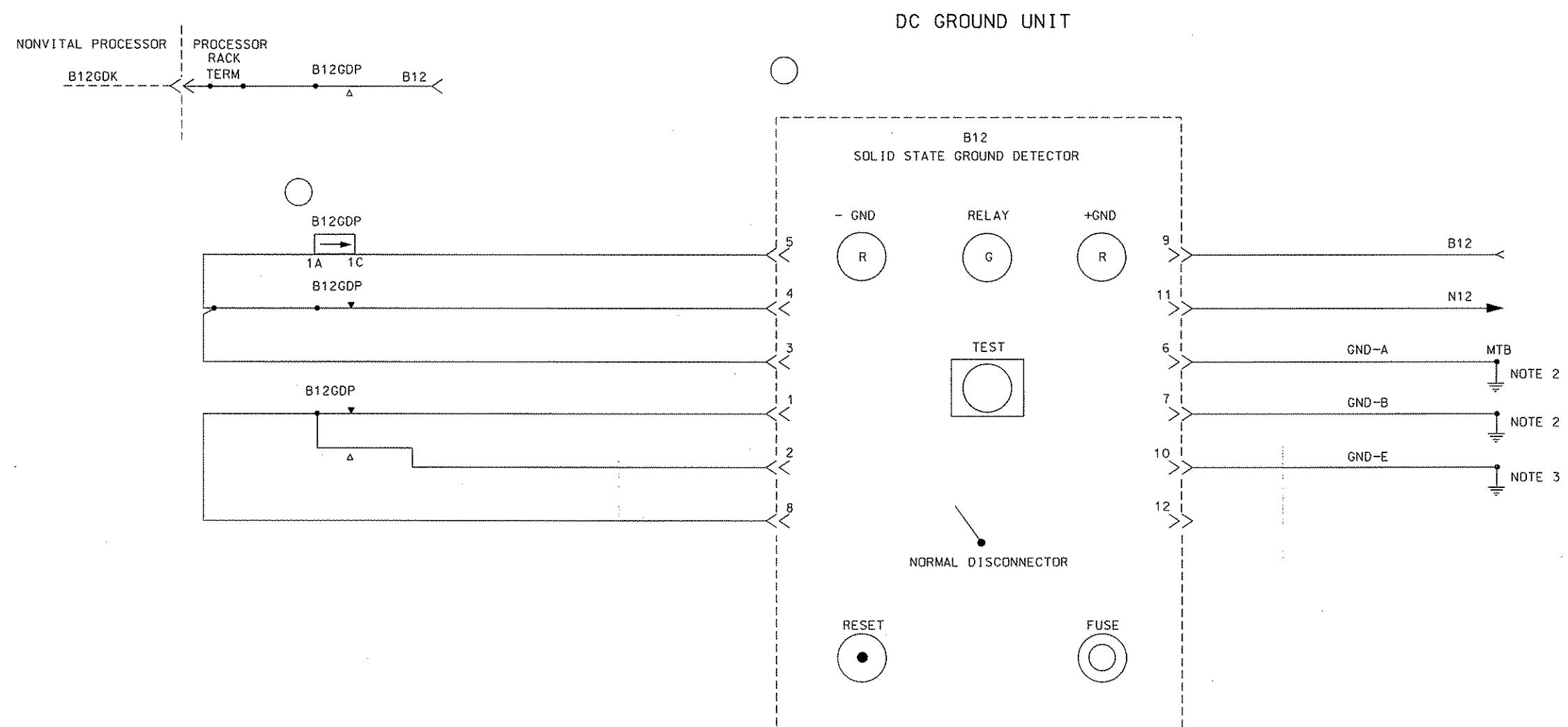


NOTES:

- CASE WIRING THIS SHEET #14, UNLESS NOTED.
- GND 3 & 4 TO BE CIRCUITED TO INDEPENDENT GND RODS.

 Gannett Fleming Transit & Rail Systems			THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.	 MICHAEL T. McNAMARA PROFESSIONAL ENGINEER Pittsburgh, PA	DMJM HARRIS AECOM FOUR GATEWAY CENTER 20TH FLOOR PITTSBURGH, PA. 15222 APPROVED DATE	DESIGNED SM NARANG DRAWN HT TRAN CHECKED JF SAMEAN IN CHARGE CD JONES DATE APR. 28, 2008 SCALE NTS	PORT AUTHORITY OF ALLEGHENY COUNTY PITTSBURGH NORTH SHORE CONNECTOR NSC TRAIN SYSTEM (SYSTEM WIDE) TYPICAL AC GROUND DETECTOR CIRCUITS	
							 Port Authority	CONTRACT NO. NSC-009 DWG. NO. SG128 SHT. 389

ALLEGHENY RELAY ROOM

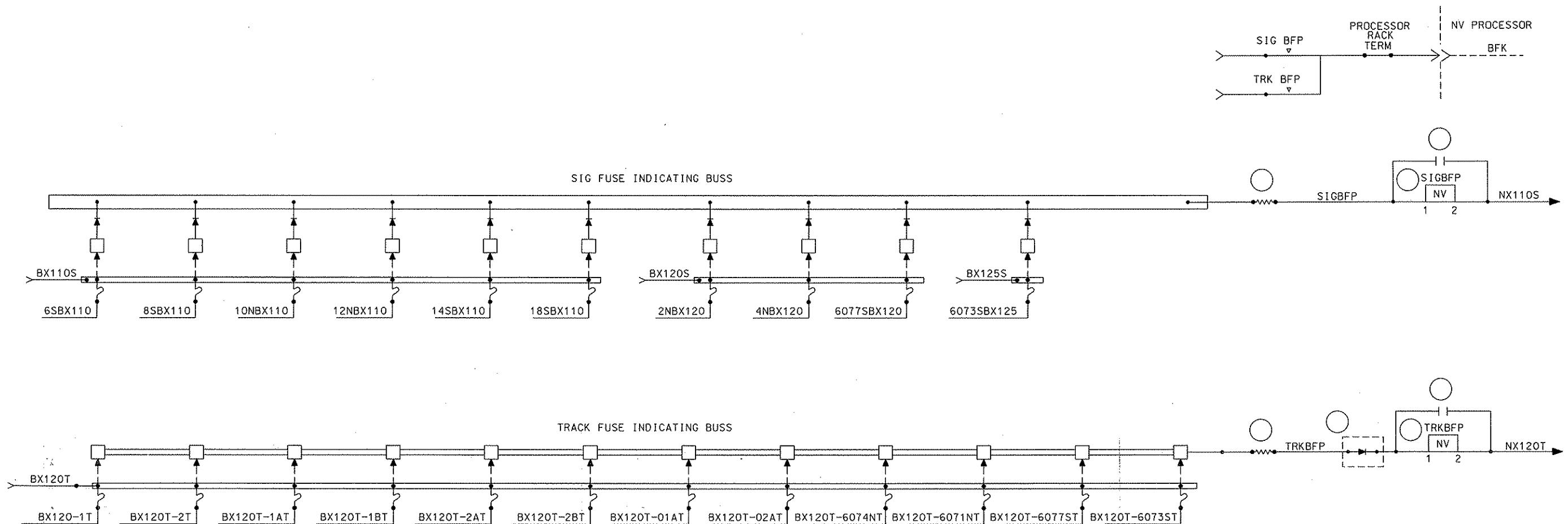


NOTES:

- ALL WIRING #16 UNLESS OTHERWISE NOTED.
- GND-A & GND-B TO BE CIRCUTED TO INDEPENDENT GND RODS.
- GND-E IS TO BE CIRCUTED TO GND BUSS.

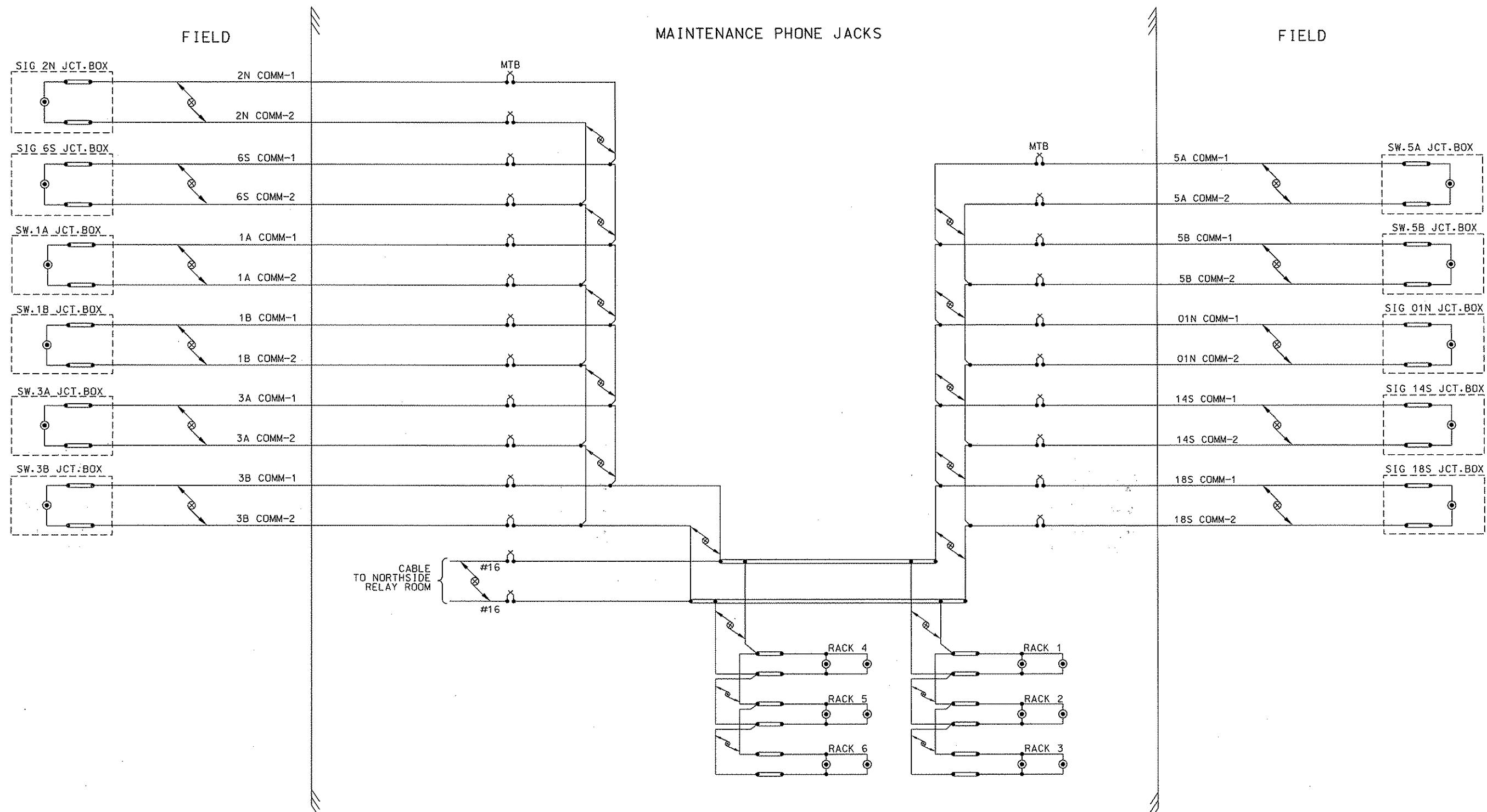
 Gannett Fleming Transit & Rail Systems	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 5%;">NO.</th><th style="width: 15%;">DATE</th><th style="width: 80%;">DESCRIPTION</th></tr> </thead> <tbody> <tr> <td></td><td></td><td>REVISIONS</td></tr> </tbody> </table>	NO.	DATE	DESCRIPTION			REVISIONS	<p>THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.</p>	 MICHAEL T. McNAMARA LICENSE NO. 3705-R EXAMINER	DMJM HARRIS AECOM FOUR GATEWAY CENTER 20TH FLOOR PITTSBURGH, PA. 15222	DESIGNED BY SM NARANG	PORT AUTHORITY OF ALLEGHENY COUNTY PITTSBURGH
NO.	DATE	DESCRIPTION										
		REVISIONS										
DRAWN BY HT TRAN												
					CHECKED BY JF SAMEAN	NORTH SHORE CONNECTOR NSC TRAIN SYSTEM (SYSTEM WIDE) TYPICAL DC GROUND DETECTOR CIRCUITS						
					IN CHARGE BY CD JONES							
					DATE APR. 28, 2008							
					SCALE NTS	 Port Authority CONTRACT NO. NSC-009 DWG. NO. SG129 SHT. 390						

ALLEHENY RELAY ROOM



Gannett Fleming Transit & Rail Systems			<p>THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.</p>	<p>REGISTERED PROFESSIONAL</p> <p>MICHAEL T. McNAMARA DOWNS NO. 3703-2</p>	<p>DMJM HARRIS AECOM</p> <p>FOUR GATEWAY CENTER 20TH FLOOR PITTSBURGH, PA. 15222</p>	<p>DESIGNED SM NARANG DRAWN HT TRAN CHECKED JF SAMEAN IN CHARGE CD JONES DATE APR. 28, 2008 SCALE NTS</p>	<p>PORT AUTHORITY OF ALLEGHENY COUNTY PITTSBURGH</p> <p>NORTH SHORE CONNECTOR NSC TRAIN SYSTEM (SYSTEM WIDE) TYPICAL AC BLOWN FUSE CIRCUITS</p>	
							<p>Port Authority</p>	<p>CONTRACT NO. NSC-009 DWG. NO. SG191 SHT. 391</p>
NO. DATE	DESCRIPTION	REVISIONS	<p>Michael T. McNamara David P. Henry 4/28/08</p>		SIGNATURE	APPROVED	DATE	

ALLEGHENY RELAY ROOM



NOTES:

1. RACK TO RACK WIRING #16.
 2. MTB WIRING #20.
 3. FIELD WIRE #14, UNLESS NOTED.



No.	DATE	DESCRIPTION
REVISIONS		

THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.



DMJM HARRIS AECON
FOUR GATEWAY CENTER
20TH FLOOR
PITTSBURGH, PA. 15222
Daniel P. Harrington 4/28/08
APPROVED DATE

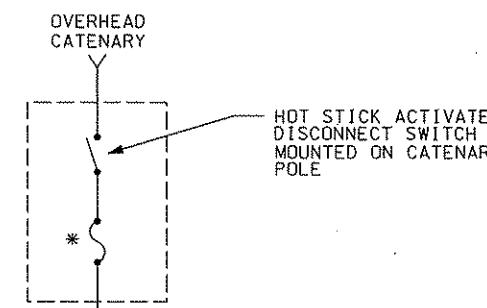
PORT AUTHORITY OF ALLEGHENY COUNTY
 PITTSBURGH
 NORTH SHORE CONNECTOR
 NSC TRAIN SYSTEM (SYSTEM WIDE)
 TYPICAL
 MAINTENANCE TELEPHONE CIRCUITS

ALLEGHENY RELAY ROOM

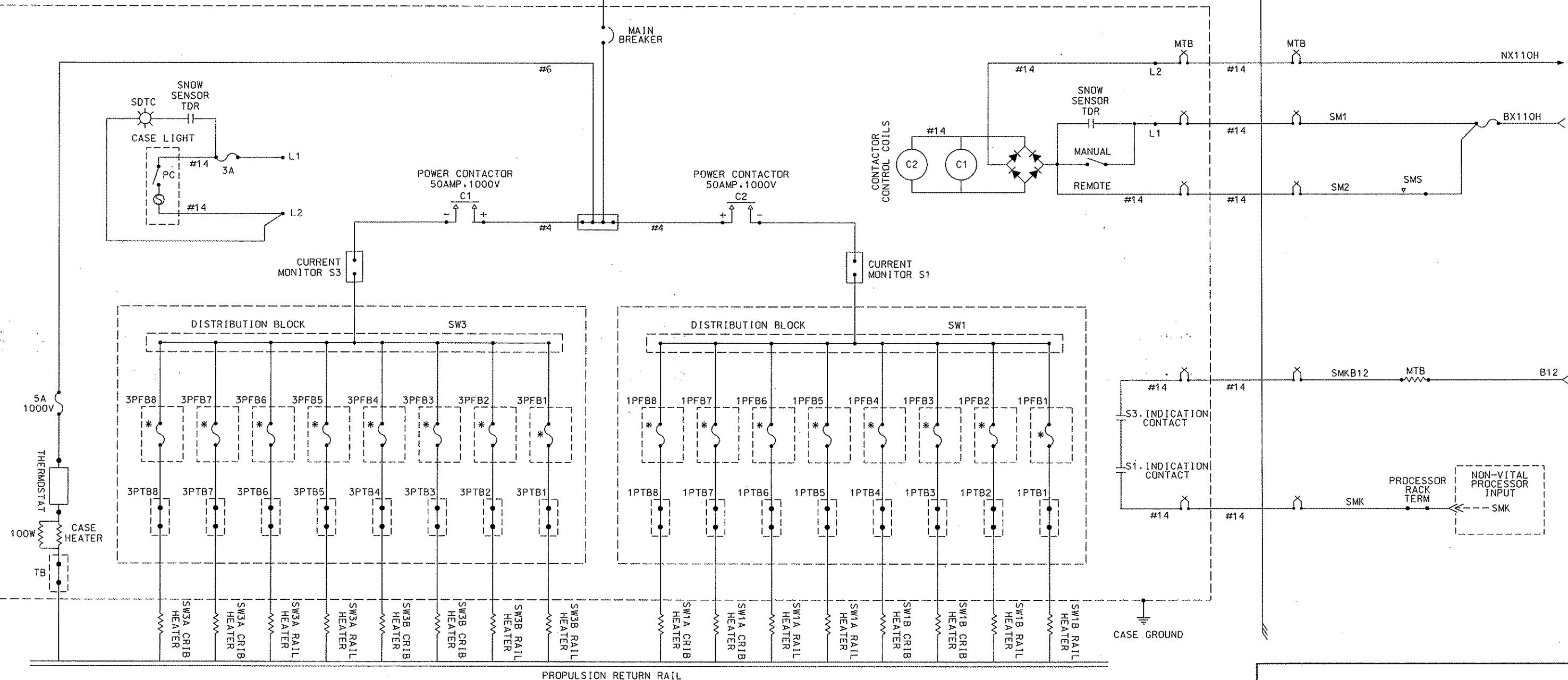
LOAD CALCULATIONS

#8 SW RAIL LENGTH = 19' - 6"
 LENGTH OF SW HTR RODS = 19.5' x 2 = 39' SAY = 40'
 LENGTH OF CRIB HTR RODS = 5' x 4 = 20'
 TOTAL LENGTH OF ALL HTR RODS = 40' + 20' = 60'
 TOTAL WATTAGE PER SW = 60' x 150W = 9000W
 TOTAL WATTAGE FOR X-OVER = 9000 x 2 = 18000W
 TOTAL CURRENT/X-OVER = 18000/650V = 27.69 x 125% = 35A

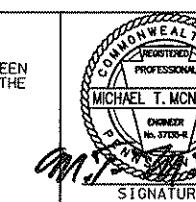
FIELD



SWITCH HEATER CONTROL CASE 1-3



THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.



DMJM HARRIS

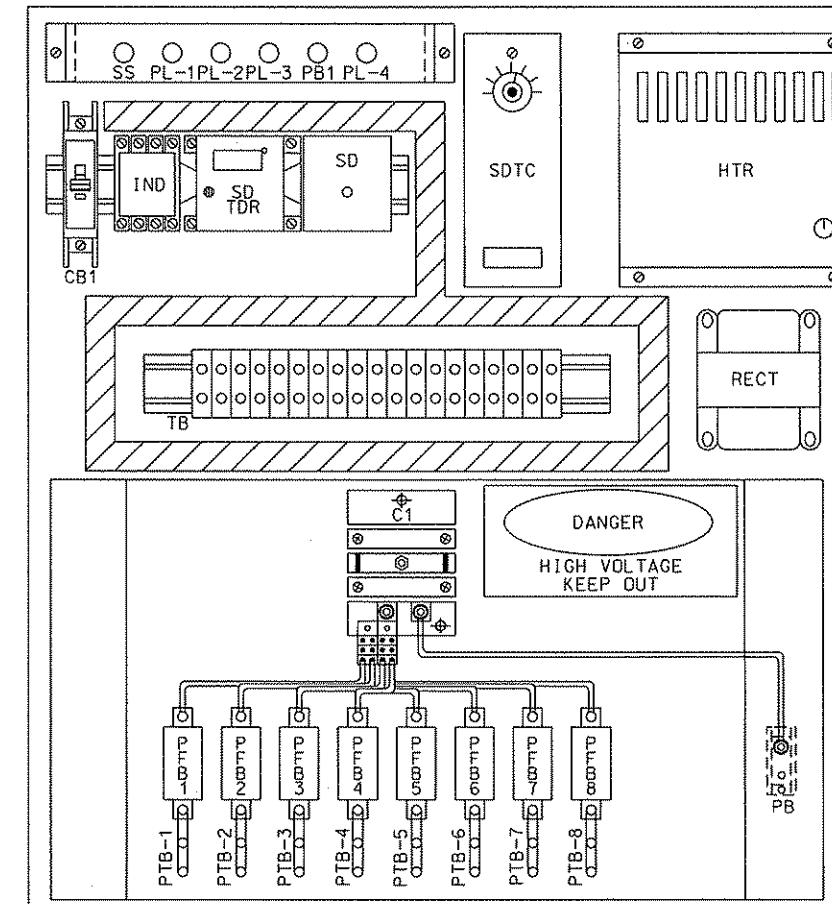
AECOM

DESIGNED SM NARANG
DRAWN HT TRAN
CHECKED JF SAMEAN
IN CHARGE CD JONES
DATE APR. 28, 2008
SIGNATURE
APPROVED DATE

PORT AUTHORITY OF ALLEGHENY COUNTY
PITTSBURGH
NORTH SHORE CONNECTOR
NSC TRAIN SYSTEM (SYSTEM WIDE)
TYPICAL
SWITCH HEATER CONTROL CIRCUITS
Port Authority
CONTRACT NO. NSC-009
DWG. NO. SG134 SHT. 393

Gannett Fleming
Transit & Rail Systems

NO.	DATE	DESCRIPTION
REVISIONS		



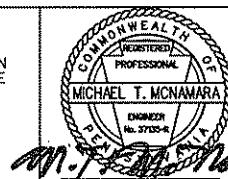
SWITCH HEATER CONTROL CASE DETAIL-TYPICAL

NOTES:

1. TYPICAL CASE SHOWN FOR SINGLE CROSSOVER.
CONTRACTOR TO SIZE CASE TO FIT ALL NECESSARY
EQUIPMENT FOR ALL SWITCH HEATERS REQUIRED.
 2. CASE SIZE SHALL NOT EXCEED ALLOCATED BLISTER SPACE
PROVIDE ON ELEVATED STRUCTURE. SEE NSC-007 (OTHER DRAWING)



THE PREPARATION OF THIS DOCUMENT HAS BEEN
FINANCED IN PART THROUGH A GRANT FROM THE
FEDERAL TRANSIT ADMINISTRATION, U.S.
DEPARTMENT OF TRANSPORTATION, UNDER THE
URBAN MASS TRANSPORTATION ACT OF 1964,
AS AMENDED, FOR THE PORT AUTHORITY OF
ALLEYNG COUNTY, PENNSYLVANIA.



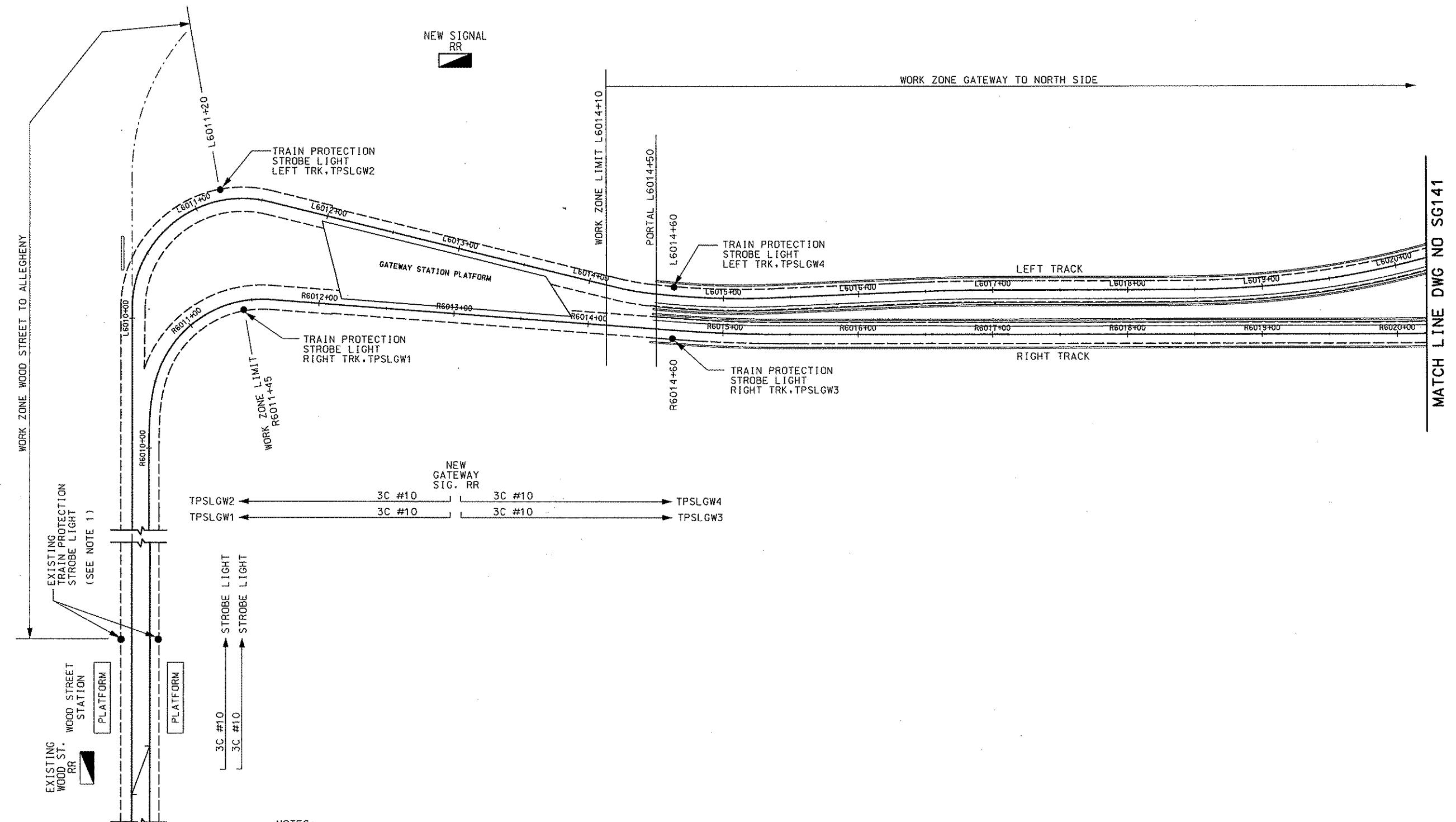
DMJM HARRIS | **AECON**
FOUR GATEWAY CENTER
20TH FLOOR
PITTSBURGH, PA. 15222
 **David F. Harrington** 4/28/08
APPROVED DATE

PITTSBURGH

PENNSYLVANIA

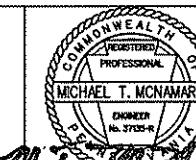
**NORTH SHORE CONNECTOR
NSC TRAIN SYSTEM (SYSTEM WIDE)
TYPICAL
SWITCH HEATER CASE DETAILS**

Port Authority <small>Moving people to life</small>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%; padding: 2px;">CONTRACT NO.</td><td style="width: 33%; padding: 2px;">NSC-009</td></tr> <tr> <td style="padding: 2px;">DWG. NO.</td><td style="padding: 2px;">SG195</td></tr> <tr> <td></td><td style="padding: 2px;">SHT.</td></tr> </table>	CONTRACT NO.	NSC-009	DWG. NO.	SG195		SHT.
CONTRACT NO.	NSC-009						
DWG. NO.	SG195						
	SHT.						



MATCH LINE DWG NO SG141

THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.



DMJM HARRIS | AECOM
FOUR GATEWAY CENTER
20TH FLOOR
PITTSBURGH, PA. 15222
JF SAMEAN
CD JONES
APR. 28, 2008
Signature: *John J. McNamee*
APPROVED DATE: *David J. Henry 4/28/08*

PORT AUTHORITY OF ALLEGHENY COUNTY
Pittsburgh, Pennsylvania
NORTH SHORE CONNECTOR
NSC TRAIN SYSTEM (SYSTEM WIDE)
TRAINWAY PROTECTION-STROBE LIGHT SYSTEM
EQUIPMENT LOCATION AND CABLE PLAN
Port Authority
CONTRACT NO. NSC-009
DWG. NO. SG140 SHT. 395

Gannett Fleming
Transit & Rail Systems

NO.	DATE	DESCRIPTION
REVISIONS		

MATCH LINE DWG NO SC140

WORK ZONE GATEWAY TO NORTHSIDE

LEFT TR

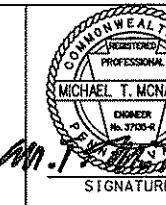
1

R6025-F00
LIGHT TRACK

MATCH LINE DWG NO 142



THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.



DMJM HARRIS AECO
FOUR GATEWAY CENTER
20TH FLOOR
PITTSBURGH, PA. 15222
Daniel J. Harrington 4/28/01
APPROVED DATE

PORT AUTHORITY OF ALLEGHENY COUNTY
 PITTSBURGH PENNSYLVANIA

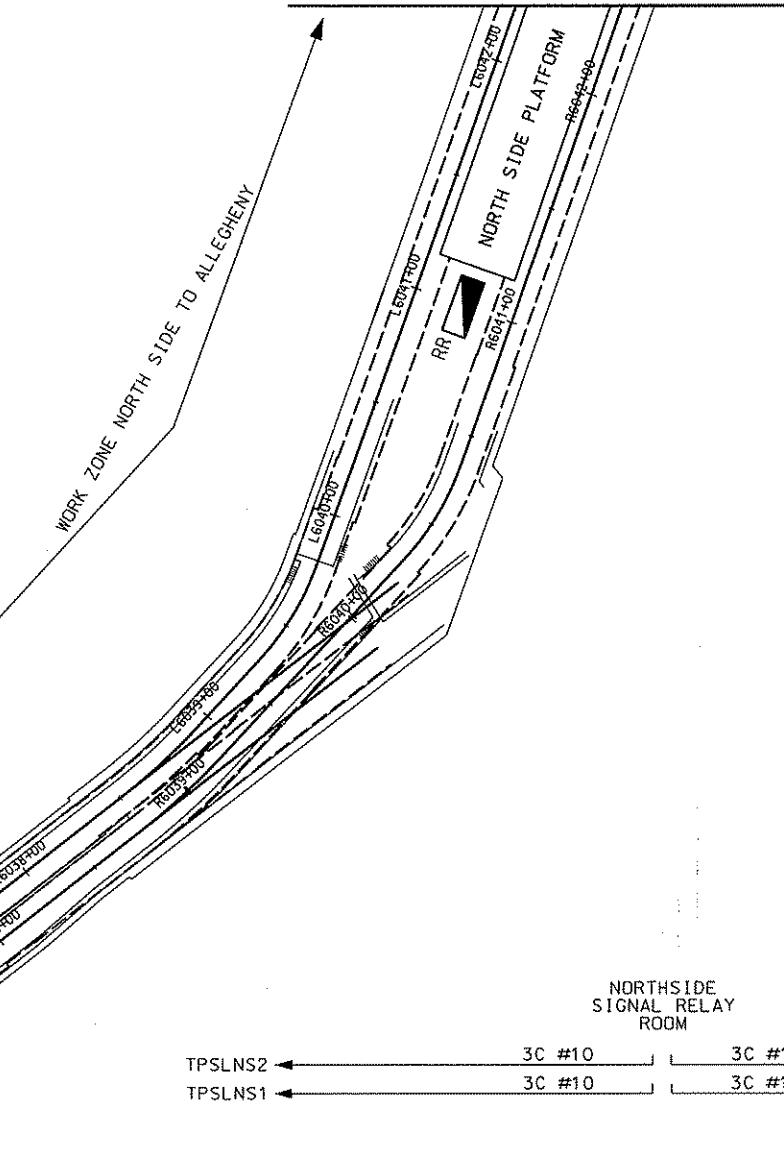
**NORTH SHORE CONNECTOR
 NSC TRAIN SYSTEM (SYSTEM WIDE)
 TRAINWAY PROTECTION STROBE LIGHT SYSTEM
 EQUIPMENT LOCATION AND CABLE PLAN**

MATCH LINE DWG NO SG141

WORK ZONE GATEWAY TO NORTH SIDE
TRAIN PROTECTION STROBE LIGHT LEFT TRK, TPSLNS2
LEFT TRACK
R6033+00 R6034+00 R6035+00
R6033+00 R6034+00 R6035+00
RIGHT TRACK
TRAIN PROTECTION STROBE LIGHT RIGHT TRK, TPSLNS1

WORK ZONE LIMIT R6037+20

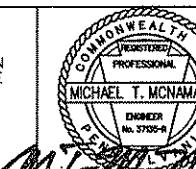
MATCH LINE DWG NO SG143



DWG NO. SG143

Gannett Fleming
Transit & Rail Systems

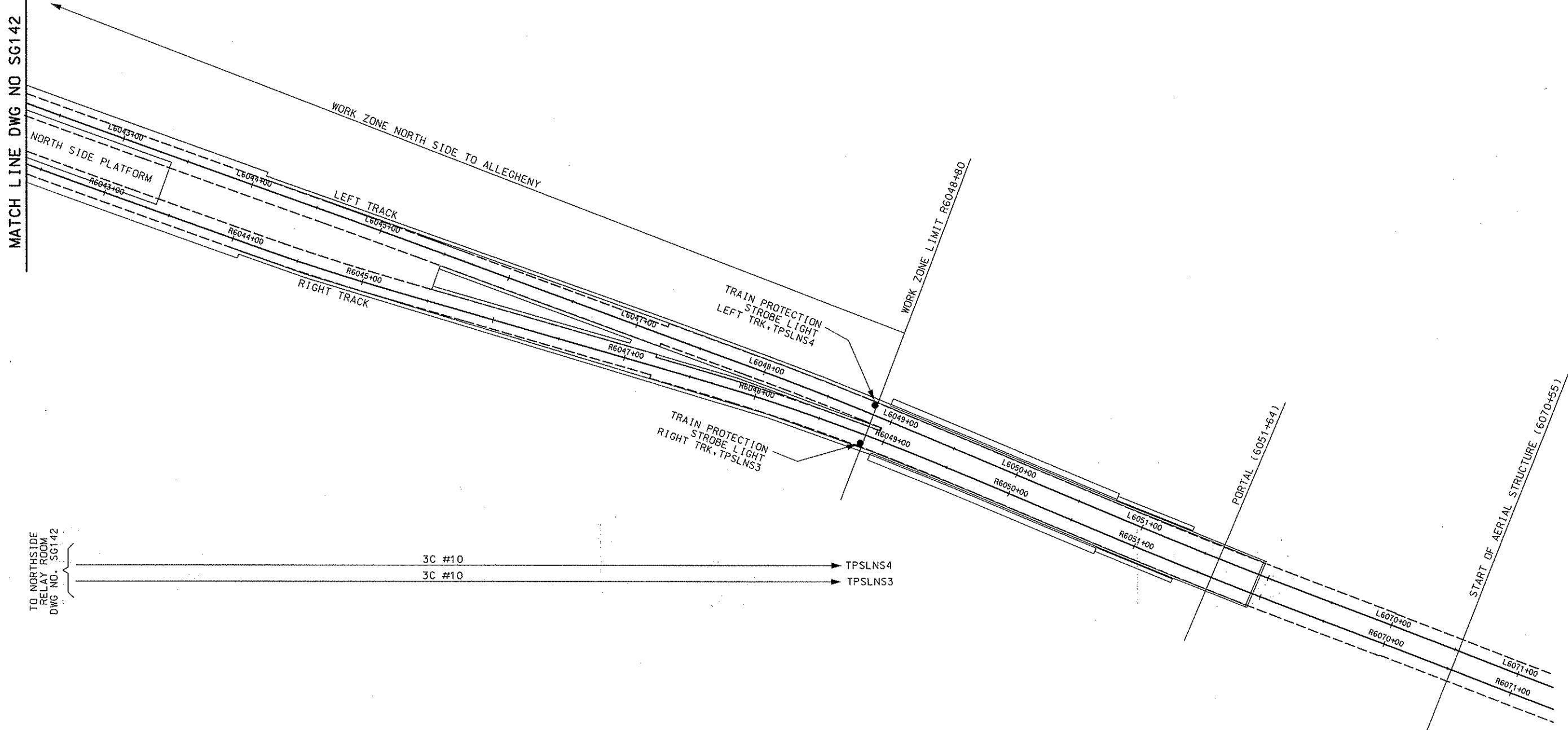
THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.



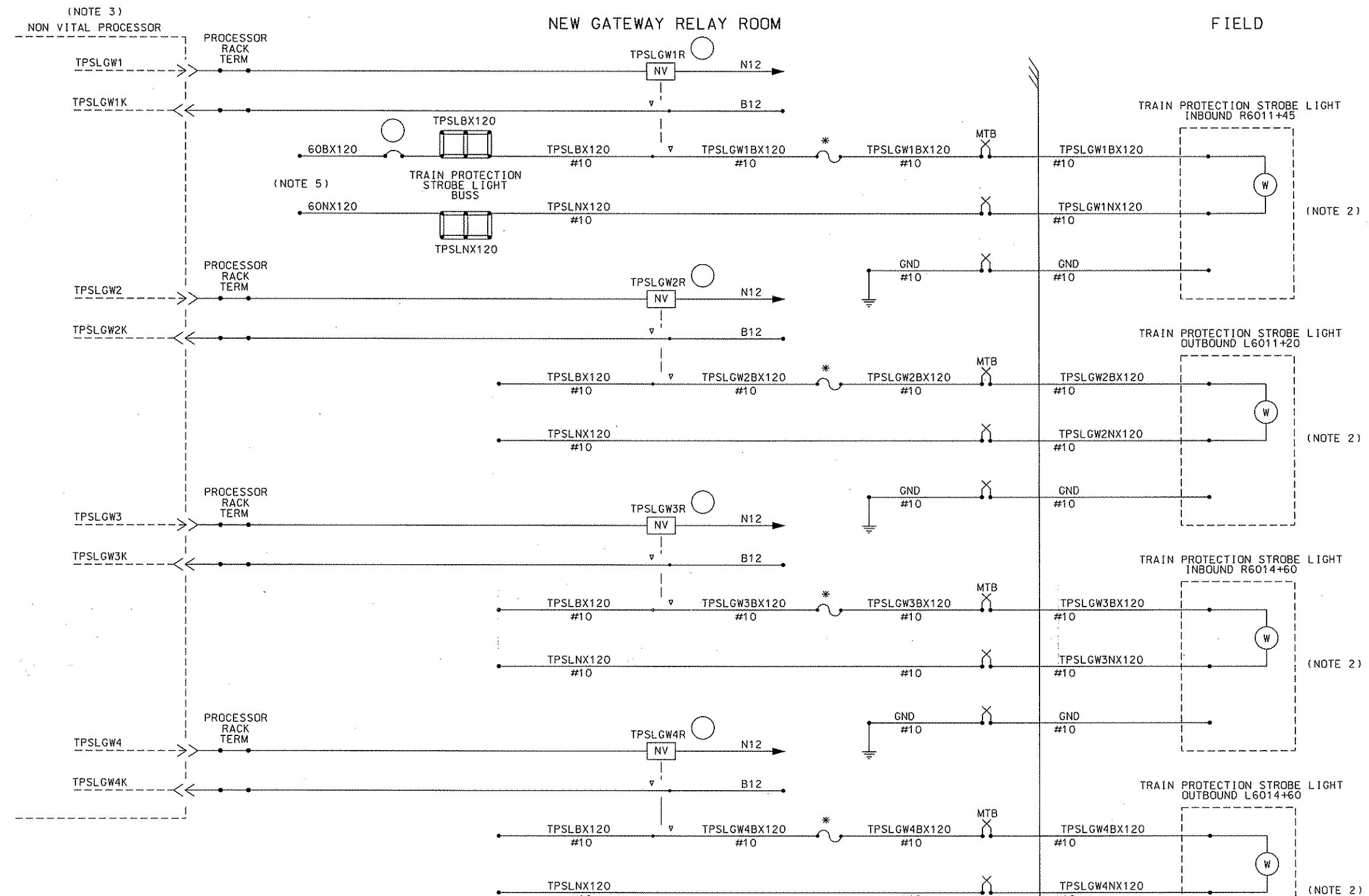
DMJM HARRIS | AECOM
FOUR GATEWAY CENTER
20TH FLOOR
PITTSBURGH, PA. 15222
JC TRAUM
JC TRAUM
JF SAMEAN
CD JONES
APR. 28, 2008
NTS
Port Authority
CONTRACT NO. NSC-009
DWG. NO. SG142
SHT. 397
Signature: Michael T. McNamara, April 28, 2008
Signature: David F. Tracy, April 28, 2008
Signature: JC Traum, April 28, 2008
Signature: JF Samean, April 28, 2008
Signature: CD Jones, April 28, 2008"/>

PORT AUTHORITY OF ALLEGHENY COUNTY
PITTSBURGH
PENNSYLVANIA
NORTH SHORE CONNECTOR
NSC TRAIN SYSTEM (SYSTEM WIDE)
TRAINWAY PROTECTION STROBE LIGHT SYSTEM
EQUIPMENT LOCATION PLAN
CONTRACT NO. NSC-009
DWG. NO. SG142
SHT. 397

NO.	DATE	DESCRIPTION	REVISIONS

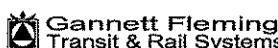


 Gannett Fleming Transit & Rail Systems			<small>THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.</small>	 MICHAEL T. MCNAMARA PROFESSIONAL ENGINEER PE No. 3735-R	DMJM HARRIS AECOM <small>FOUR GATEWAY CENTER 20TH FLOOR PITTSBURGH, PA. 15222</small>	DESIGNED JC TRAUM	PORT AUTHORITY OF ALLEGHENY COUNTY	
	NO. DATE	DESCRIPTION				DRAWN JC TRAUM	PITTSTONIA	
		REVISIONS				CHECKED JF SAMEAN	NORTH SHORE CONNECTOR	
						IN CHARGE CD JONES	NSC TRAIN SYSTEM (SYSTEM WIDE)	
						DATE APR. 28, 2008	TRAINWAY PROTECTION STROBE LIGHT SYSTEM EQUIPMENT LOCATION PLAN	
	SCALE	NTS					Port Authority	
	CONTRACT NO.	NSC-009					DWG. NO. SG143	
	DWG. NO.	SG143					SHT. 398	



NOTES:

1. CIRCUIT AS SHOWN IS TYPICAL FOR STROBE LIGHTS FROM NEW GATEWAY SIGNAL RELAY ROOM. CONTRACTOR TO WIRE STROBE LIGHTS FROM NORTHSIDE RELAY ROOM IN ACCORDANCE WITH CABLE PLAN SG142.
 2. CONTRACTOR TO VERIFY STROBE LIGHT OPERATION, WIRING, AND INSTALLATION REQUIREMENTS WITH MANUFACTURER.
 3. STROBE LIGHTS ARE CONTROLLED BY THE OPERATIONS CONTROL CENTER (OCC) VIA INPUT TO THE SIGNAL RELAY ROOM NON-VITAL PROCESSOR. CONTRACTOR TO VERIFY CONTROL INPUTS WITH PAAC OPERATIONS.
 4. * - TO BE SIZED BY CONTRACTOR.
 5. 60BX120 AND 60NX120 TO BE CONNECTED TO 60 HZ 120V AC POWER DISTRIBUTION



THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.



DMJM HARRIS
FOUR GATEWAY C
20TH FLOOR
PITTSBURGH, PA

AECON
ENTER
. 15222
. aheas

DESIGN
DRAWN
CHECKED
IN CHARGE
DATE
SCALE

ED J
D J S
RGE CD
APR. 28,

TRAUM
TRAUM
AMEAN
JONES
2008
NTC

POP
PITTSBU

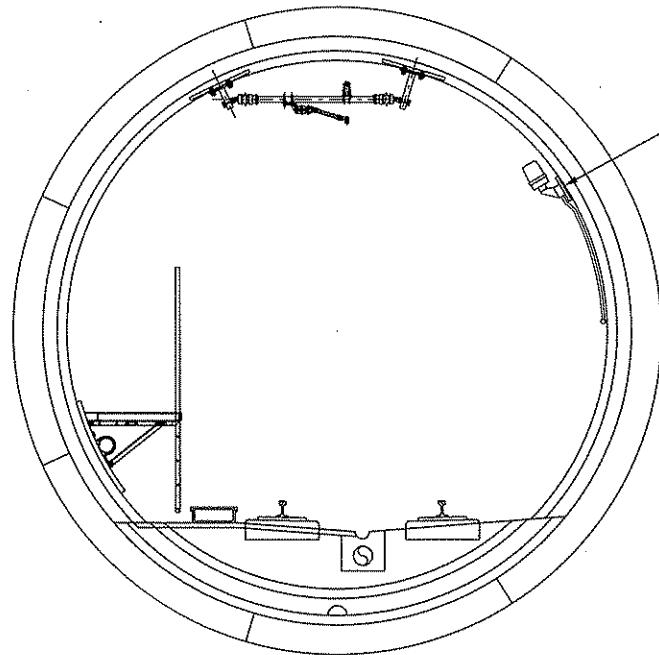
RT AUTI
URGH

**NORTH
EBC TRAIN
WAY PROTE
T**

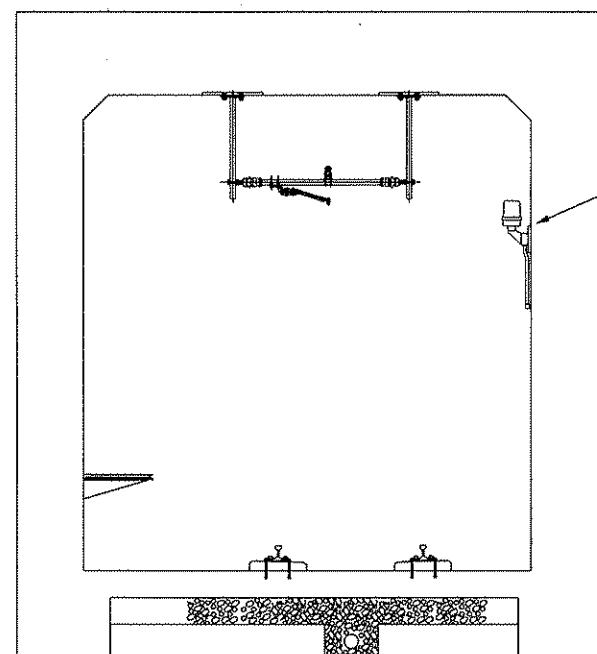
OF ALLEGED
SHORE CONNECTOR
SYSTEM (SYSTEM
SECTION STROBE
TYPICAL CIRCUITS)

PITTSBURGH PORT AUTHORITY OF ALLEGHENY COUNTY
PENNSYLVANIA

**NORTH SHORE CONNECTOR
NSC TRAIN SYSTEM (SYSTEM WIDE)
TRAINWAY PROTECTION STROBE LIGHT SYSTEM
TYPICAL CIRCUITS**



INSTALLATION IN BORED TUNNEL

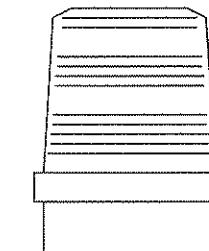


INSTALLATION IN BOXED TUNNEL

STROBE LIGHT TUNNEL INSTALLATION

STROBE WARNING LIGHT

WALL MOUNTING BRACKET KIT
FEDERAL SIGNAL CORP MODEL LWMB2
OR APPROVED EQUAL



STROBE WARNING LIGHT W/ CLEAR
DOME COVER FEDERAL SIGNAL CORP
MODEL FB2PST OR APPROVED EQUAL

HOT DIPPED GALVANIZED
CONCRETE ANCHORS,
SIZE TO BE SUBMITTED
BY CONTRACTOR
FOR APPROVAL

WATERTIGHT SEALED
CONNECTION
1/2" RGS CONDUIT
(NOTE 1)

SIDE VIEW

TOP VIEW

STROBE LIGHT MOUNTING

STROBE WARNING LIGHT

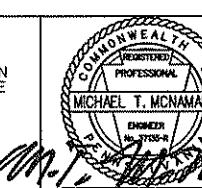
NOTES:

1. DETAILS SHOWN ARE TYPICAL. CONTRACTOR TO INSTALL STROBE LIGHTS IN ACCORDANCE WITH MANUFACTURER REQUIREMENTS AND SPECIFICATIONS.
2. CONTRACTOR TO VERIFY STROBE LIGHT INSTALLATION DOES NOT VIOLATE PAAC TRAIN CAR DYNAMIC MOVEMENT ENVELOPE.
3. CONDUIT TO BE INSTALLED FROM STROBE LIGHT MOUNTING DOWN ALONG WALL TO MEET THE EXPRESS CONDUITS.

Gannett Fleming
Transit & Rail Systems

NO.	DATE	DESCRIPTION
REVISIONS		

THE PREPARATION OF THIS DOCUMENT HAS BEEN
FINANCED IN PART THROUGH A GRANT FROM THE
FEDERAL TRANSIT ADMINISTRATION, U.S.
DEPARTMENT OF TRANSPORTATION, UNDER THE
URBAN MASS TRANSPORTATION ACT OF 1964,
AS AMENDED, FOR THE PORT AUTHORITY OF
ALLEGHENY COUNTY, PENNSYLVANIA.



DMJM HARRIS | AECOM

FOUR GATEWAY CENTER
20TH FLOOR
PITTSBURGH, PA. 15222

DESIGNED J TRAUM
DRAWN J TRAUM
CHECKED J SAMEAN
IN CHARGE CD JONES
DATE APR. 26, 2008
SCALE NTS

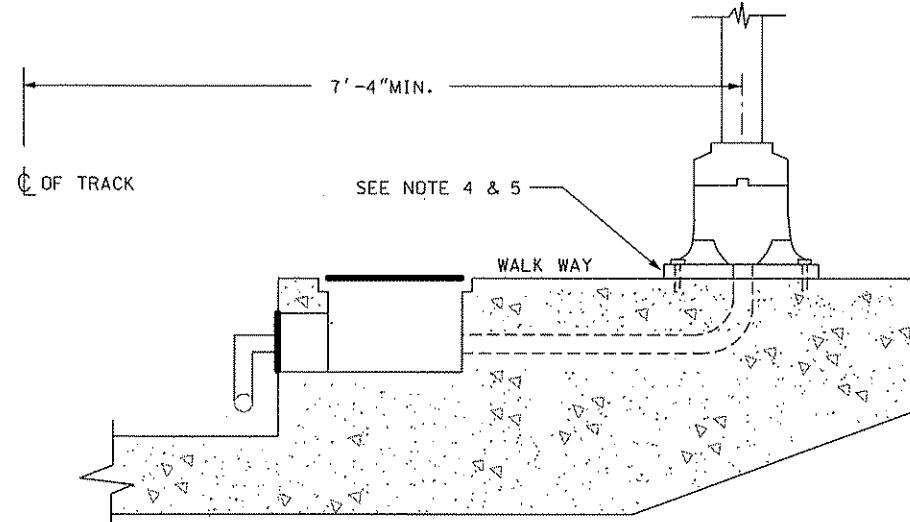
Daniel P. Tracy 4/28/08
APPROVED DATE

PORT AUTHORITY OF ALLEGHENY COUNTY
PITTSBURGH
PENNSYLVANIA

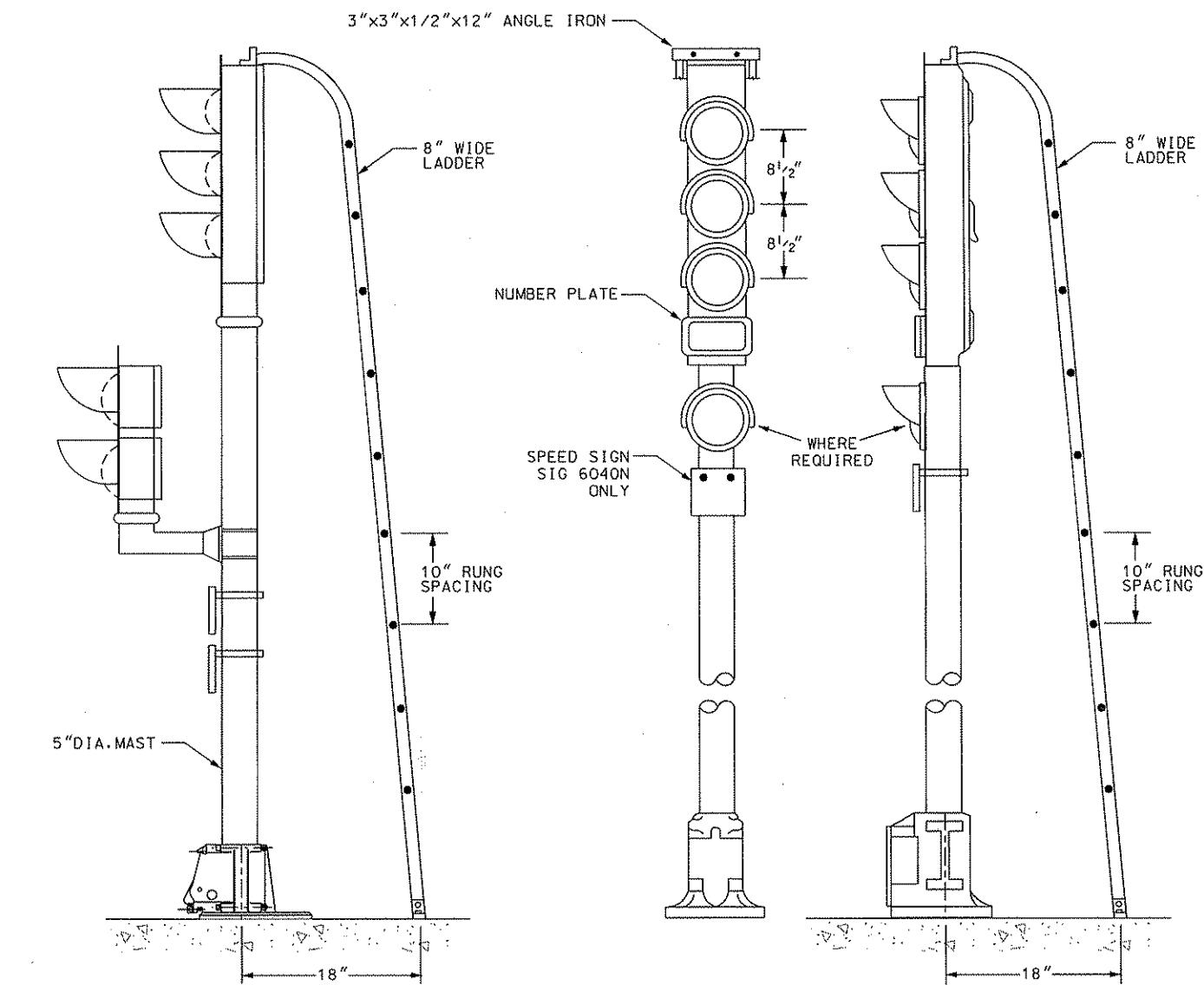
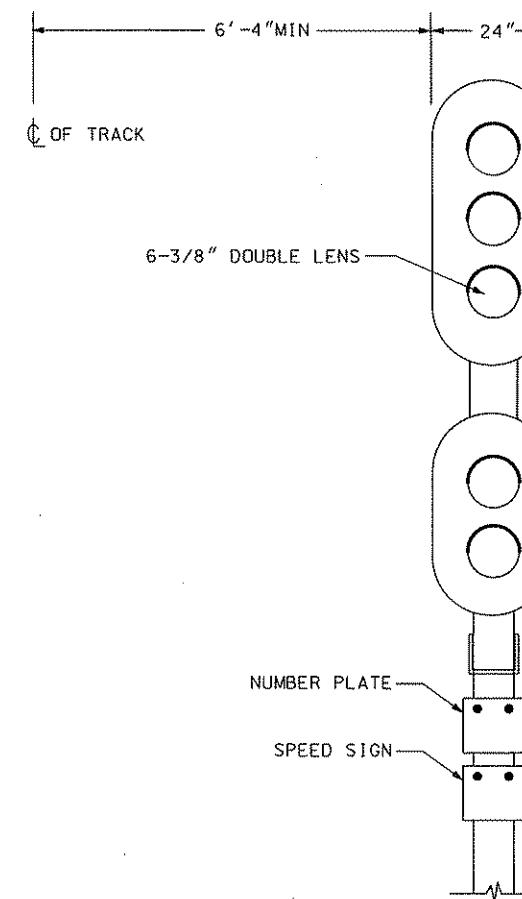
NORTH SHORE CONNECTOR
NSC TRAIN SYSTEM (SYSTEM WIDE)
TRAINWAY PROTECTION STROBE LIGHT SYSTEM
INSTALLATION DETAILS

Port Authority

CONTRACT NO. NSC-009
DWG. NO. SG145 SHT. 400



ELEVATED STRUCTURE MOUNTED SIGNAL DETAIL



NOTES:

1. SIGNAL AS SHOWN IS TYPICAL. CONFIGURATION AND NUMBER OF SIGNAL HEADS VARIES ACCORDING TO ASPECT REQUIRED. (SEE DWG. SG154)
2. SIGNAL TO BE MOUNTED WITH CENTER LINE OF BOTTOM RED UNIT TO BE 9 FT ABOVE TOP OF RAIL.
3. JUNCTION BOX BASE TO HAVE 24 TERMINALS.
4. BASE TO BE SHIMMED AS REQUIRED TO LEVEL SIGNAL MAST.
5. BASE TO BE GROUTED TO SEAL OUT WEATHER.
6. ALL SIGNAL BASE OPENING TO BE SEALED WITH DUX SEAL OR EQUIVALENT AFTER CABLE IS INSTALLED.
7. ALL SIGNALS TO BE GROUNDED TO SIGNAL SYSTEM GROUND.
8. JUNCTION BOX FOR CABLES TO BE LOCATED AND INSTALLED BY CONTRACTOR.
9. JUNCTION BOX NOT REQUIRED. SIGNAL CABLES TO BE TERMINATED IN SIGNAL BASE.

ELEVATED STRUCTURE MAST MOUNTED SIGNAL DETAILS

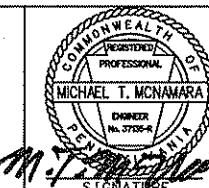
(SEE NOTE 9)

MAST MOUNTED SIGNAL DETAILS

(SIGNS 6040N, 1010S)

(SEE NOTE 8)

THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.

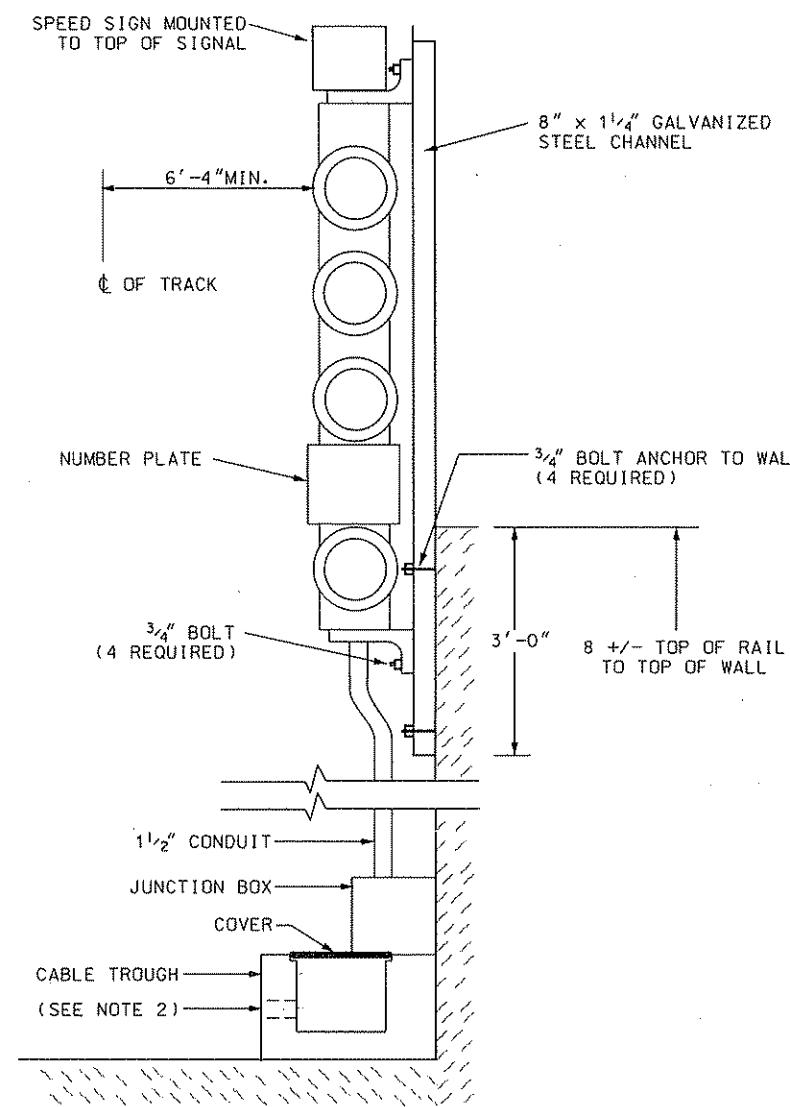


DMJM HARRIS | AECOM
FOUR GATEWAY CENTER
20TH FLOOR
PITTSBURGH, PA. 15222
CHECKED ED SPOTTS
IN CHARGE CD JONES
DATE APR. 28, 2008
SCALE NTS
APPROVED *David F. Hays 4/28/08*
SIGNATURE DATE

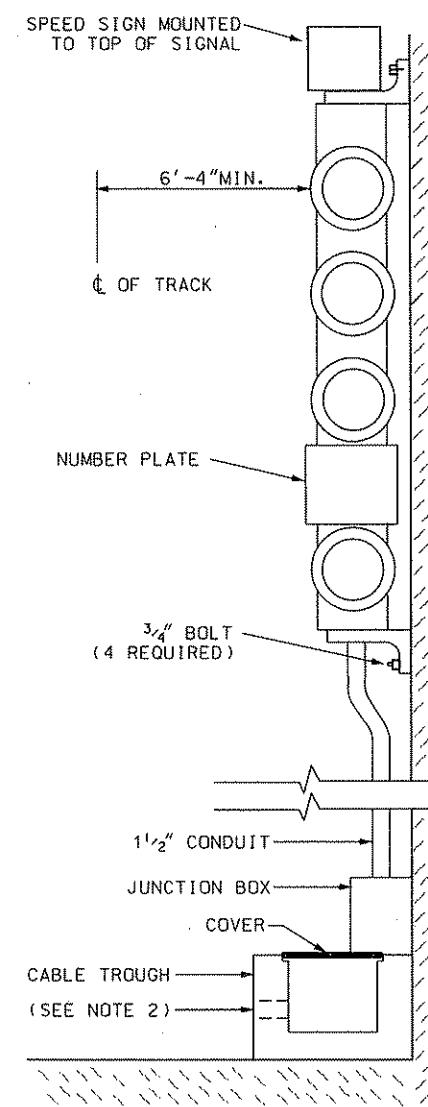
PORT AUTHORITY OF ALLEGHENY COUNTY
PITTSBURGH
NORTH SHORE CONNECTOR
NSC TRAIN SYSTEM (SYSTEM WIDE)
TYPICAL
SIGNAL LAYOUTS - MAST MOUNTED DETAILS
Port Authority
CONTRACT NO. NSC-009
DWG. NO. SG150
SHT. 401

Gannett Fleming
Transit & Rail Systems

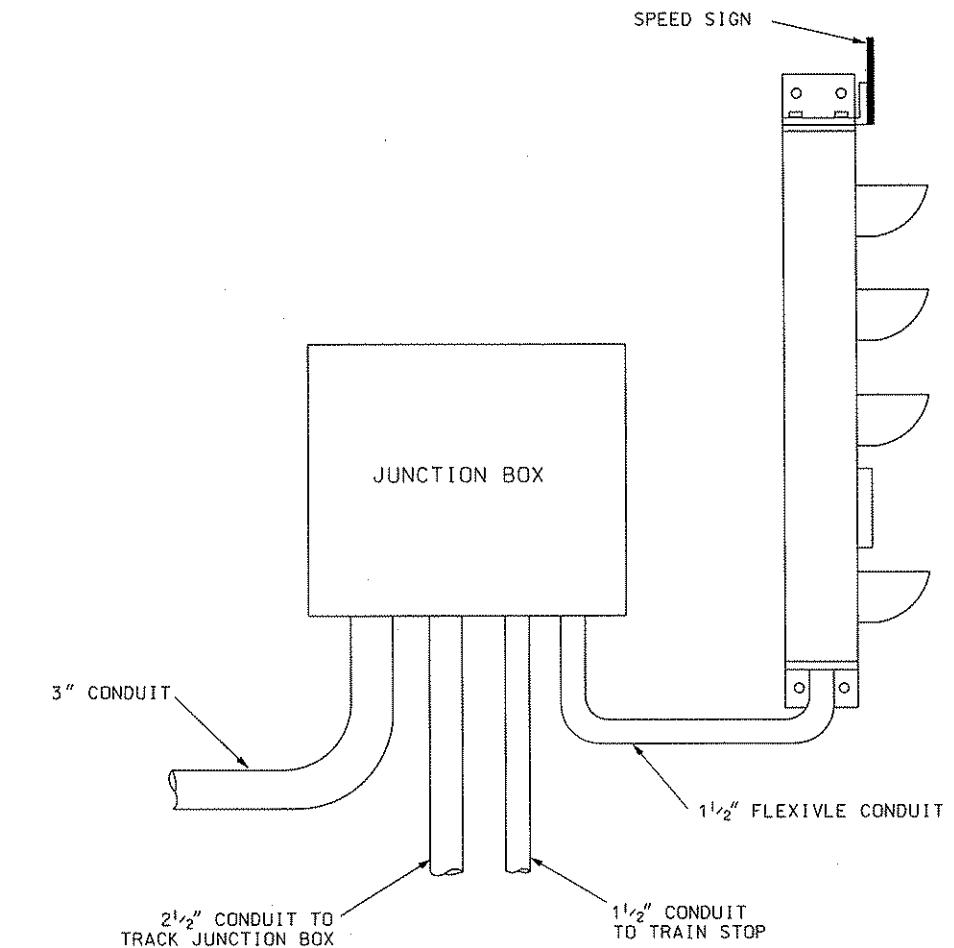
NO.	DATE	DESCRIPTION
REVISIONS		



WALL MOUNTED DETAILS
(SIGNAL 6051S)



TYPICAL TUNNEL WALL-MOUNTED SIGNAL



TYPICAL WALL-MOUNTED SIGNAL
(SIGNALS 1011N, 6011N, 6011S)

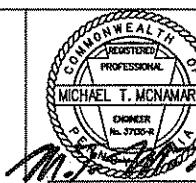
SEE NOTE 5

NOTES:

1. PROVIDE ACCESS IN COVER FOR CABLES TO ENTER JUNCTION BOX. JUNCTION BOX TO BE PROVIDED WITH COVER PLATE AND NECESSARY APPROVED TERMINALS FOR TERMINATING SIGNAL CABLE.
2. CORE BORE CABLE TROUGH AS REQUIRED FOR TRACK AND TRAIN STOP CONDUITS.
3. SIGNAL TO BE MOUNTED WITH CENTER LINE OF BOTTOM UNIT 108" ABOVE TOP OF RAIL.
4. SEE DWG #SG154 FOR SIGNAL CONFIGURATIONS.
5. FOR SIMILAR MOUNTING DETAILS OF SIGNAL AND JUNCTION BOX, SEE BORED TUNNEL DETAILS DWG SG152.
6. CONTRACTOR TO VERIFY CONDUIT SIZES BASED ON CABLE USED.

NO.	DATE	DESCRIPTION	
		REVISIONS	
Gannett Fleming Transit & Rail Systems			

THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.



SIGNATURE

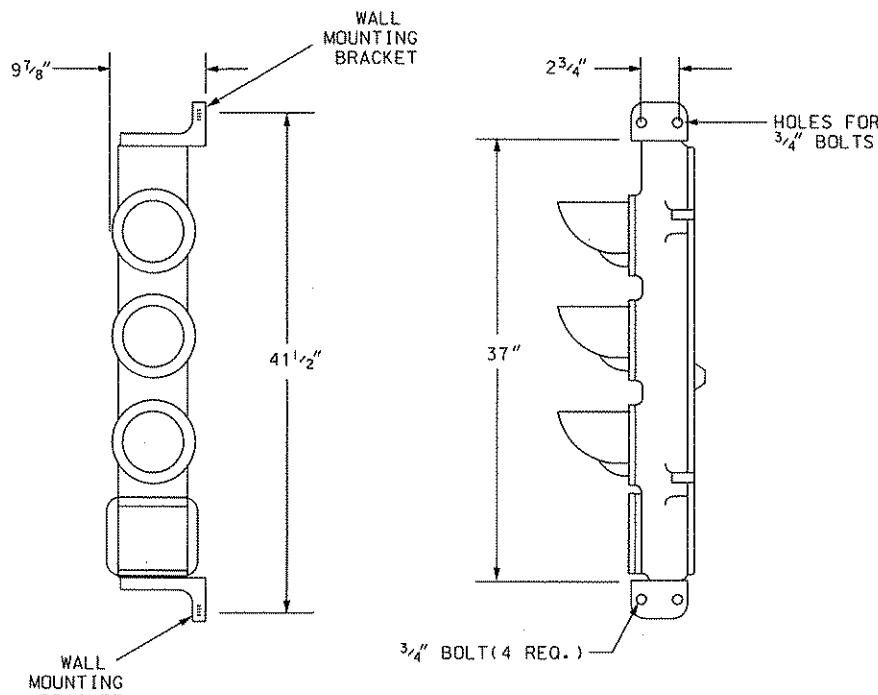
APPROVED

DATE

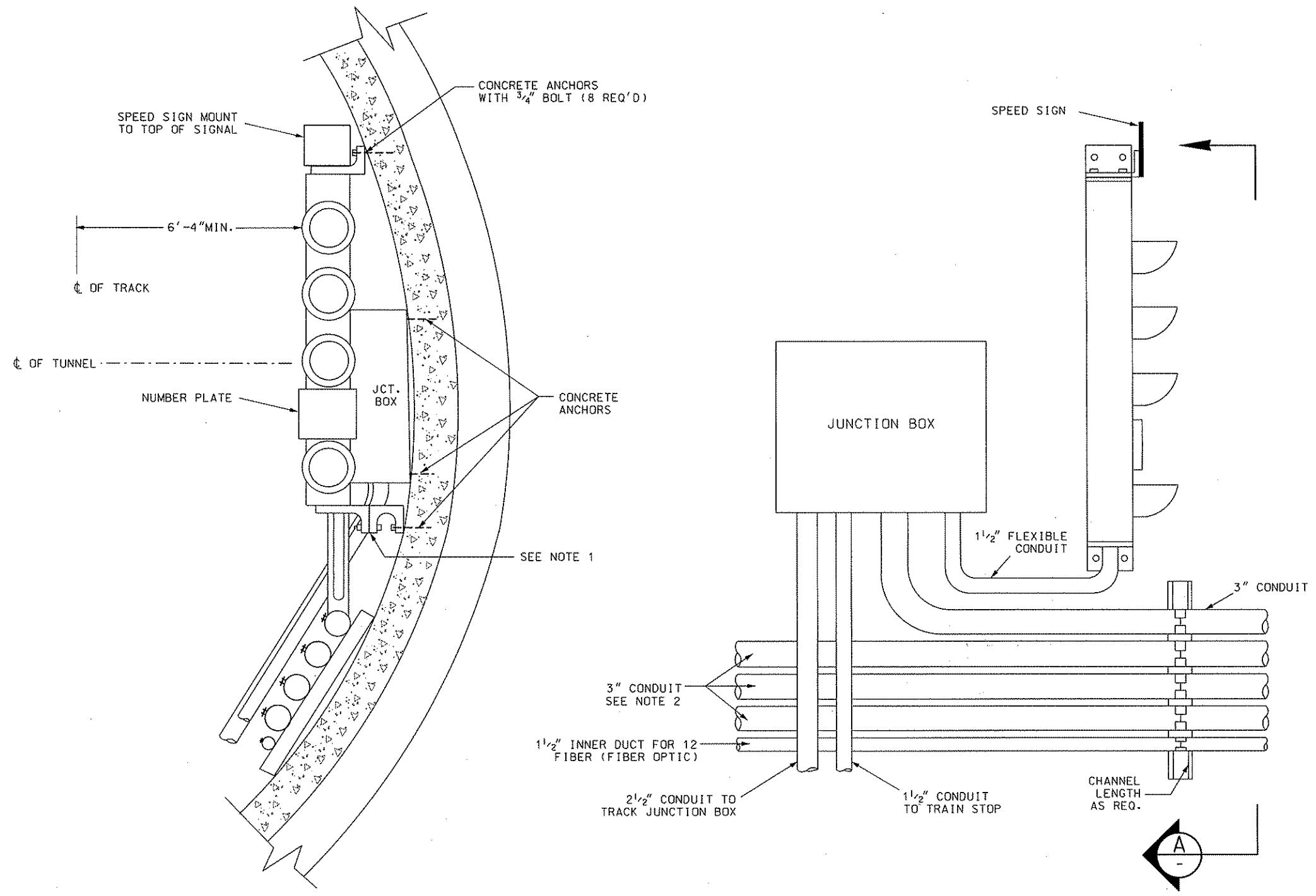
4/28/08

DMJM HARRIS | AECOM
FOUR GATEWAY CENTER
20TH FLOOR
PITTSBURGH, PA. 15222
CHECKED ED SPOTTS
IN CHARGE CD JONES
DATE APR. 28, 2008
SCALE NTS

PORT AUTHORITY OF ALLEGHENY COUNTY
PITTSBURGH
NORTH SHORE CONNECTOR
NSC TRAIN SYSTEM (SYSTEM WIDE)
TYPICAL
SIGNAL LAYOUT - WALL MOUNTED INSTALLATIONS
Port Authority
CONTRACT NO. NSC-009
DWG. NO. SG151
SHT. 402



TYPICAL TUNNEL WALL-MOUNTED SIGNAL



TYPICAL BORED TUNNEL WALL MOUNTING DETAILS

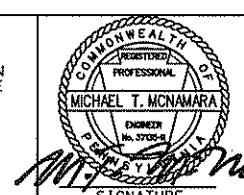
NOTES:

1. JUNCTION BOX SIZE TO BE DETERMINED BY EQUIPMENT REQUIREMENTS BUT SHALL NOT BE DEEPER THAN 8".
2. CONDUITS TO ADDITIONAL SIGNAL AND/OR CUT SECTIONS (CS) AS REQUIRED. NUMBER OF CONDUITS AND SIZE VARIES ACCORDING TO LOCATIONS.
3. CONTRACTOR TO VERIFY CONDUIT SIZES BASED ON CABLE USED.
4. SIGNAL TO BE CENTERED ON TUNNEL CENTER LINE.
5. DEPTH OF MOUNTING PENETRATION SHALL NOT EXCEED 3".

SECTION A

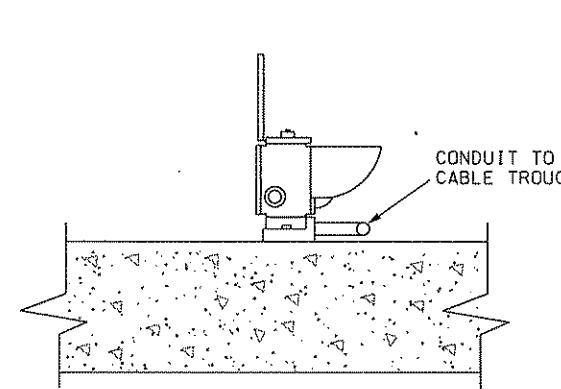
NO.	DATE	DESCRIPTION
REVISIONS		

THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.

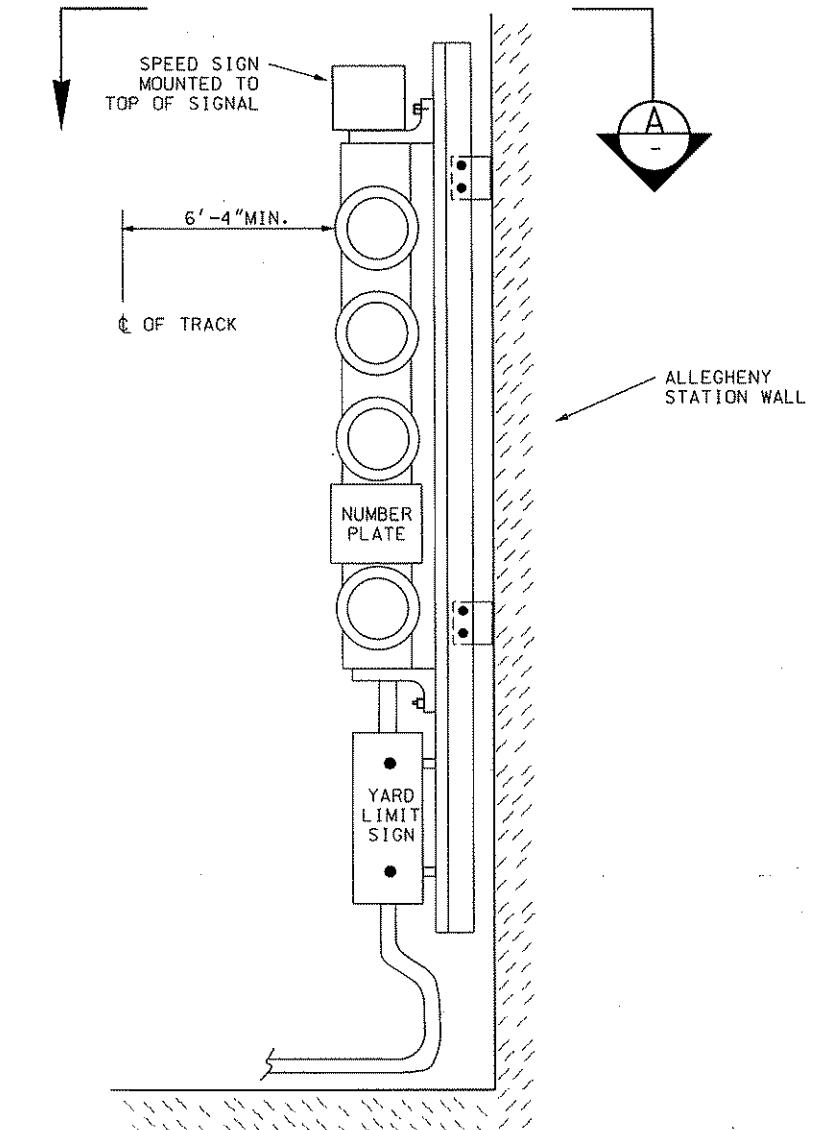
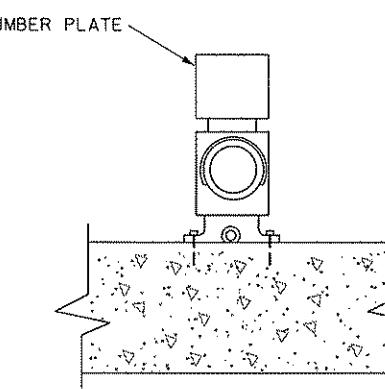


DMJM HARRIS | AECOM
FOUR GATEWAY CENTER
20TH FLOOR
PITTSBURGH, PA. 15222
SIGNATURE: *Michael T. McNamara*
APPROVED: *David F. Hays 4/28/08*
DATE: APR. 28, 2008
SCALE: NTS

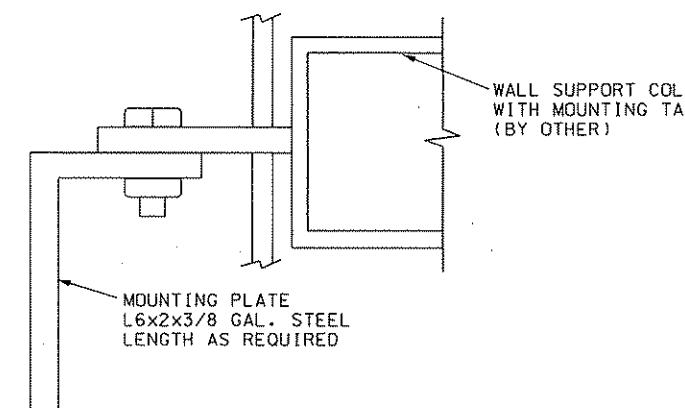
PORT AUTHORITY OF ALLEGHENY COUNTY
PITTSBURGH, PENNSYLVANIA
NORTH SHORE CONNECTOR
NSC TRAIN SYSTEM (SYSTEM WIDE)
TYPICAL
SIGNAL LAYOUT - BORED TUNNEL WALL MOUNTED DETAILS
Port Authority
CONTRACT NO. NSC-009
DWG. NO. SG152
SHT. 403



DWARF SIGNAL - ELEVAT



SECTION



WALL MOUNTED DETAILS

SOUTH BOUND TRACK			SPEED SIGNAL REQ'D
SIGNAL NO.	SIGNAL TYPE	CONFIGURATIONS	
1010S	M	4	-
6011S	W	1	8
6012S	W	1	8
6014S	W	1	8
6015S	TW	1	10
6018S	TW	1	10
6020S	TW	1	25
6027S	TW	1	25
6034S	TW	1	25
6037S	W	4	-
6039S	W	1	10
6040S	W	1	10
6043S	W	1	15
6046S	W	4	-
6051S	WS	1	25
6070S	ME	6	25
6072S	ME	6	25
6073S	ME	6	25
6077S	ME	6	25
4N	ME	7	-
6S	ME	7	-
12N	WS *	2	-
14S	ME	7	15
01N	D	5	-

LEGENDS:

W - WALL MOUNT
 TW - BORED TUNNEL WALL MOUNT
 M - MAST MOUNT
 ME - MAST MOUNT ELEVATED STRUCTURE
 D - DWARF
 WS - SPECIAL WALL MOUNT (DWG# SG151)
 * - "YARD LIMITS" SIGN REQUIRED

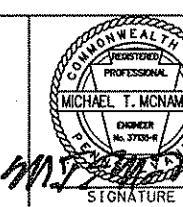
NOTE:

1. SEE DRAWINGS SG155 FOR CONFIGURATIONS.

NORTH BOUND TRACK			SPEED SIGNAL REQ'D
SIGNAL NO.	SIGNAL TYPE	CONFIGURATIONS	
1011N	W	1	8
6011N	W	1	8
6012N	W	1	15
6014N	W	1	25
6017N	TW	1	25
6020N	TW	1	25
6027N	TW	4	-
6032N	TW	4	-
6034N	TW	1	8
6037N	W	1	8
6039N	W	1	8
6040N	M	1	15
6043N	W	1	25
6046N	W	1	25
6051N	W	1	25
6074N	ME	6	10
2N	ME	7	10
8S	ME	3	-
10N	ME *	8	-
18S	ME	7	15
02N	D	5	-

NO.	DATE	DESCRIPTION	
		REVISIONS	

THE PREPARATION OF THIS DOCUMENT HAS BEEN
 FINANCED IN PART THROUGH A GRANT FROM THE
 FEDERAL TRANSIT ADMINISTRATION, U.S.
 DEPARTMENT OF TRANSPORTATION, UNDER THE
 URBAN MASS TRANSPORTATION ACT OF 1964,
 AS AMENDED, FOR THE PORT AUTHORITY OF
 ALLEGHENY COUNTY, PENNSYLVANIA.



DMJM HARRIS | AECOM
 FOUR GATEWAY CENTER
 20TH FLOOR
 PITTSBURGH, PA. 15222
 APPROVED *David J. Hay 4/28/08*
 DATE *APR. 28, 2008*

SIGNATURE

APPROVED DATE

PORT AUTHORITY OF ALLEGHENY COUNTY
 PITTSBURGH
 PENNSYLVANIA

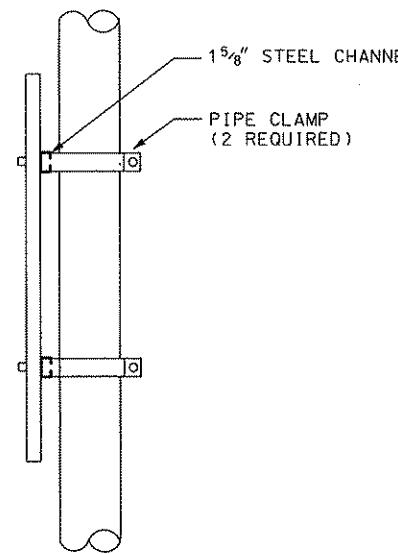
NORTH SHORE CONNECTOR
 NSC TRAIN SYSTEM (SYSTEM WIDE)
 TYPICAL
 SIGNAL TYPE

Port Authority

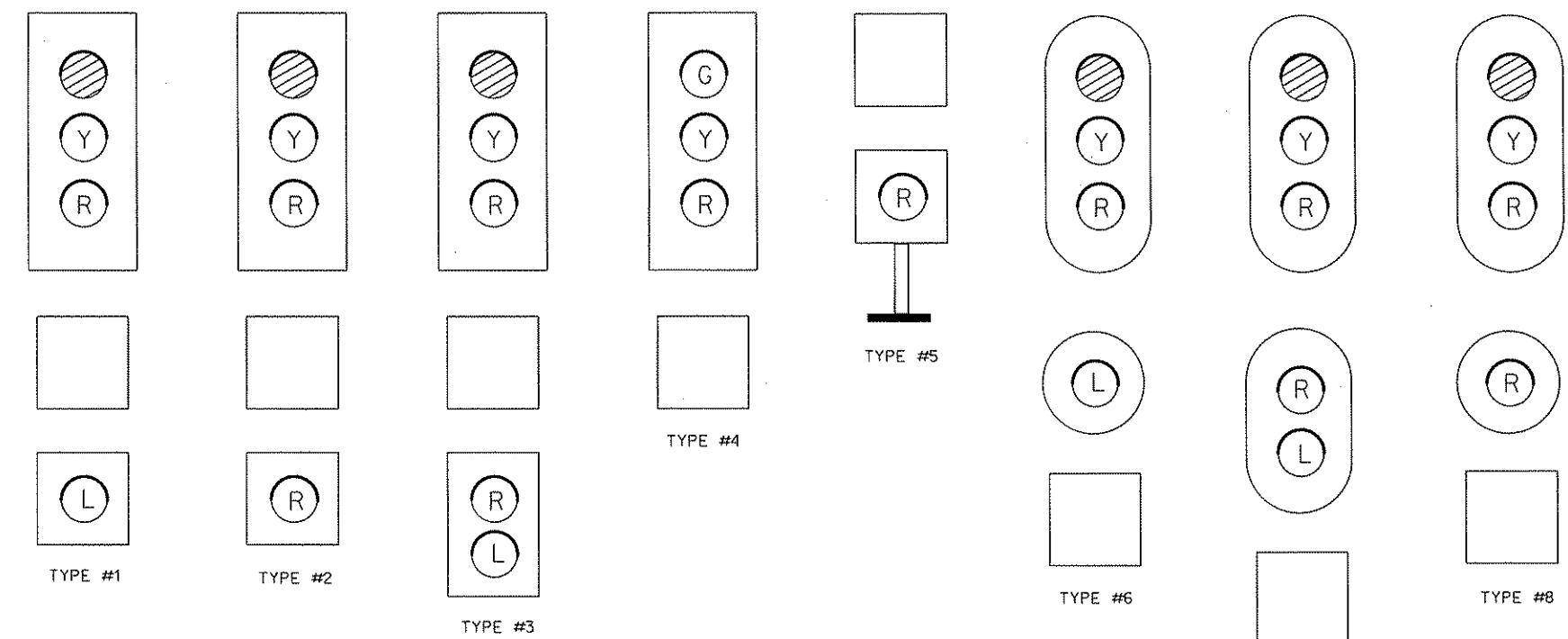
CONTRACT NO. NSC-009
 DWG. NO. SG154 SHT. 105

YARD
LIMIT

SEE NOTE 3



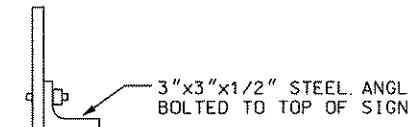
TYPICAL SIGN



SIGNAL CONFIGURATIONS

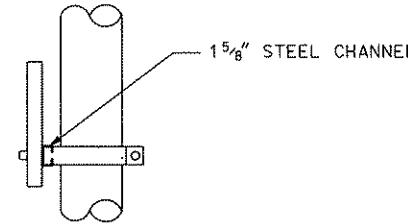
15
O O

SEE NOTE 2



15
O O

SEE NOTE 2



TOP OF SIGNAL MOUNTING

MAST MOUNTING

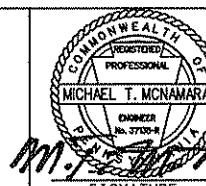
NOTES:

- ALL SIGNAL TO BE MOUNTED WITH BOTTOM UNIT 9'-0" ABOVE TOP OF THE RAIL OUTSIDE OF BORED TUNNEL.
- TYPICAL SPEED LIMIT SIGN. SEE SG154 FOR LOCATION AND SPEED DESIGNATIONS.
- YARD LIMIT SIGN TO BE INSTALLED ON SIGNAL 10N & 12N, AT ALLEGHENY.

Gannett Fleming
Transit & Rail Systems

NO.	DATE	DESCRIPTION
REVISIONS		

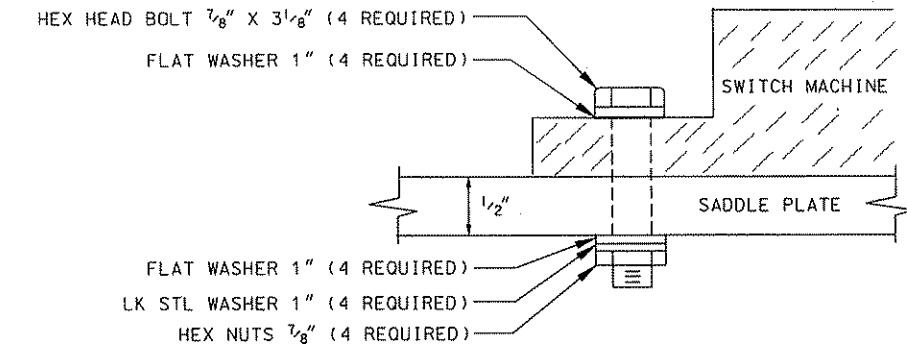
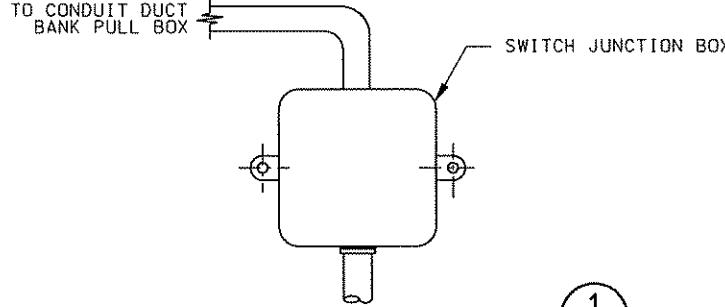
THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.



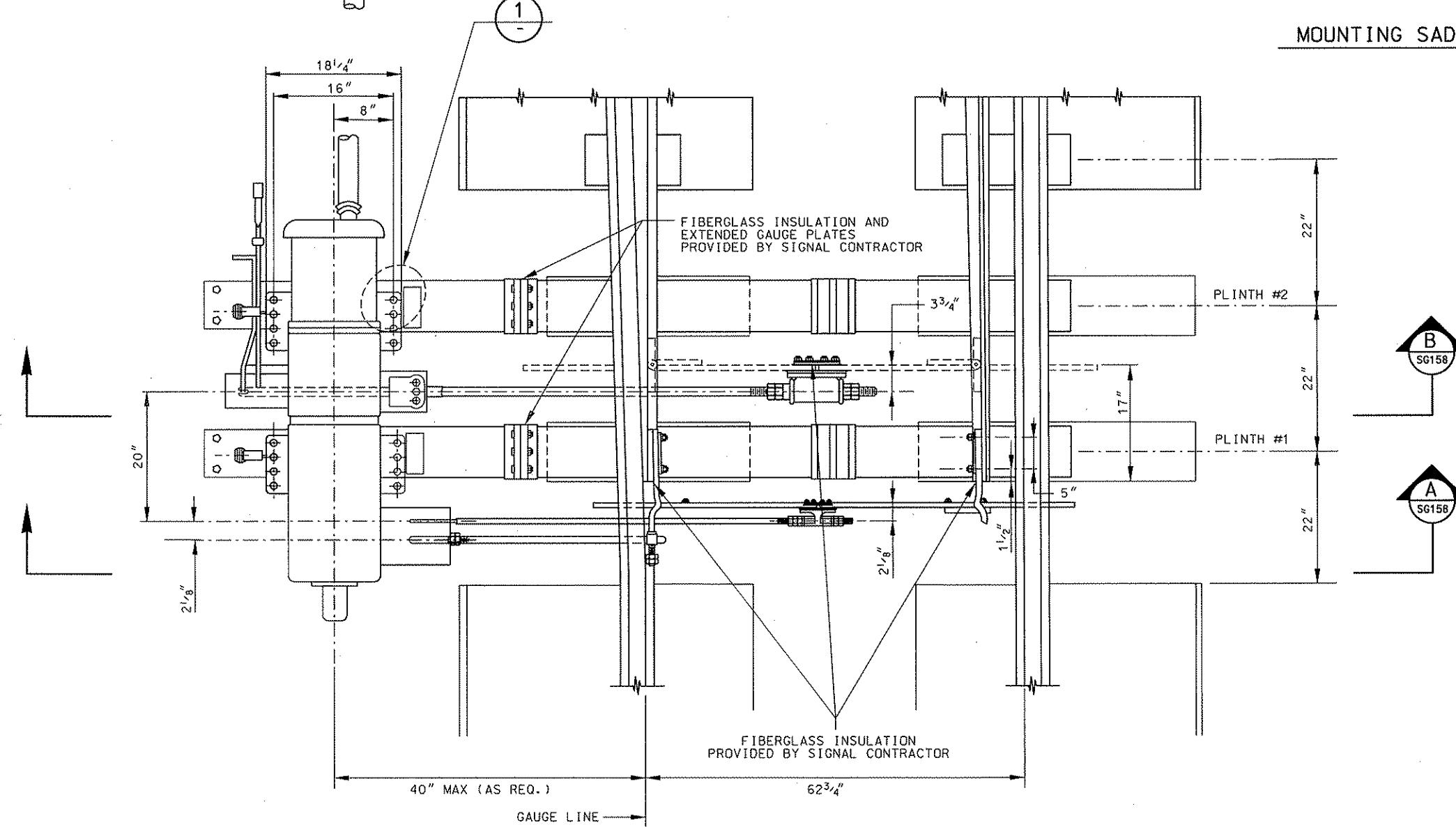
DMJM HARRIS | AECOM
FOUR GATEWAY CENTER
20TH FLOOR
PITTSBURGH, PA. 15222
CHECKED JF SAMEAN
IN CHARGE CD JONES
DATE APR. 28, 2008
SCALE NTS

APPROVED
SIGNATURE
DATE

PORT AUTHORITY OF ALLEGHENY COUNTY
PITTSBURGH
NORTH SHORE CONNECTOR
NSC TRAIN SYSTEM (SYSTEM WIDE)
TYPICAL
SIGNAL CONFIGURATIONS
Port Authority
CONTRACT NO. NSC-009
DWG. NO. SG155
SHT. 406



MOUNTING SADDLE PLATE TO SWITCH MACHINE DETAIL



POWER SWITCH LAYOUT - DIRECT FIXATION

NO.	DATE	DESCRIPTION		
			REVISIONS	

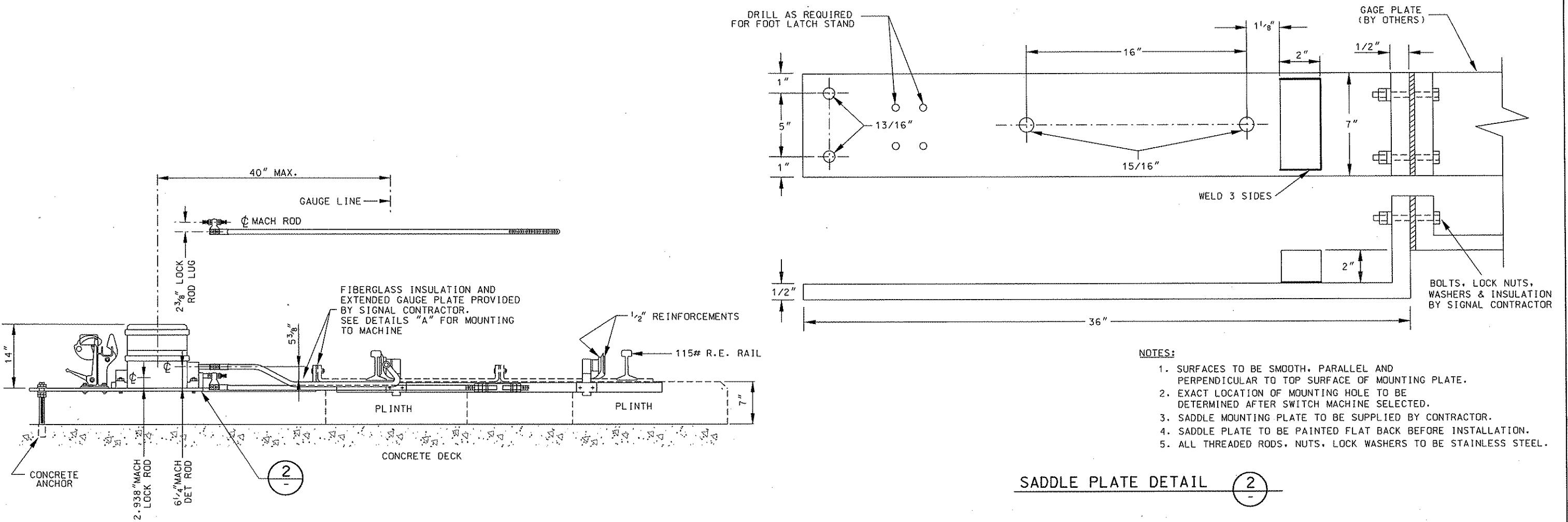
THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.



DMJM HARRIS | AECOM
FOUR GATEWAY CENTER
20TH FLOOR
PITTSBURGH, PA. 15222
CHECKED ED SPOTTS
IN CHARGE CD JONES
DATE APR. 28, 2008
SIGNATURE *David P. Henry 4/28/08*
APPROVED DATE

PORT AUTHORITY OF ALLEGHENY COUNTY
PITTSBURGH
NORTH SHORE CONNECTOR
NSC TRAIN SYSTEM (SYSTEM WIDE)
TYPICAL
DUAL CONTROL POWER SWITCH LAYOUT - DIRECT FIXATION (1 OF 2)

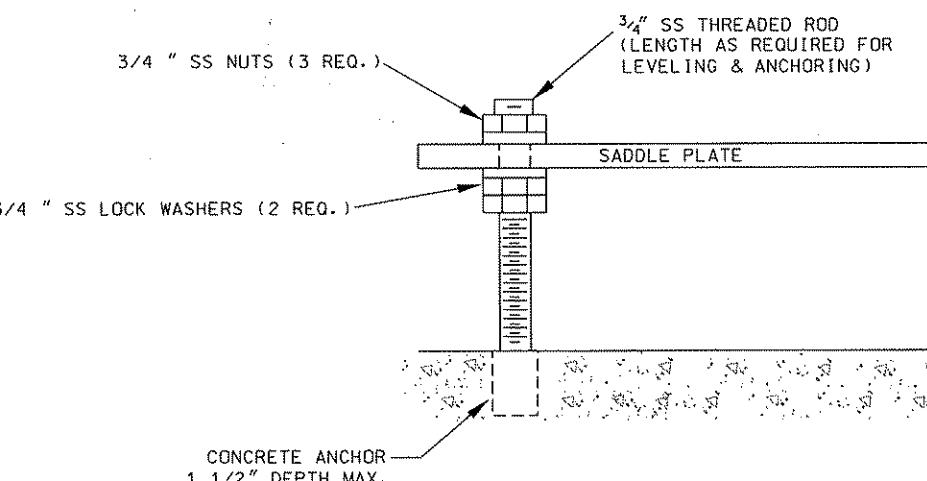
Port Authority	CONTRACT NO. NSC-009
DWG. NO. SG156	SHT. 407



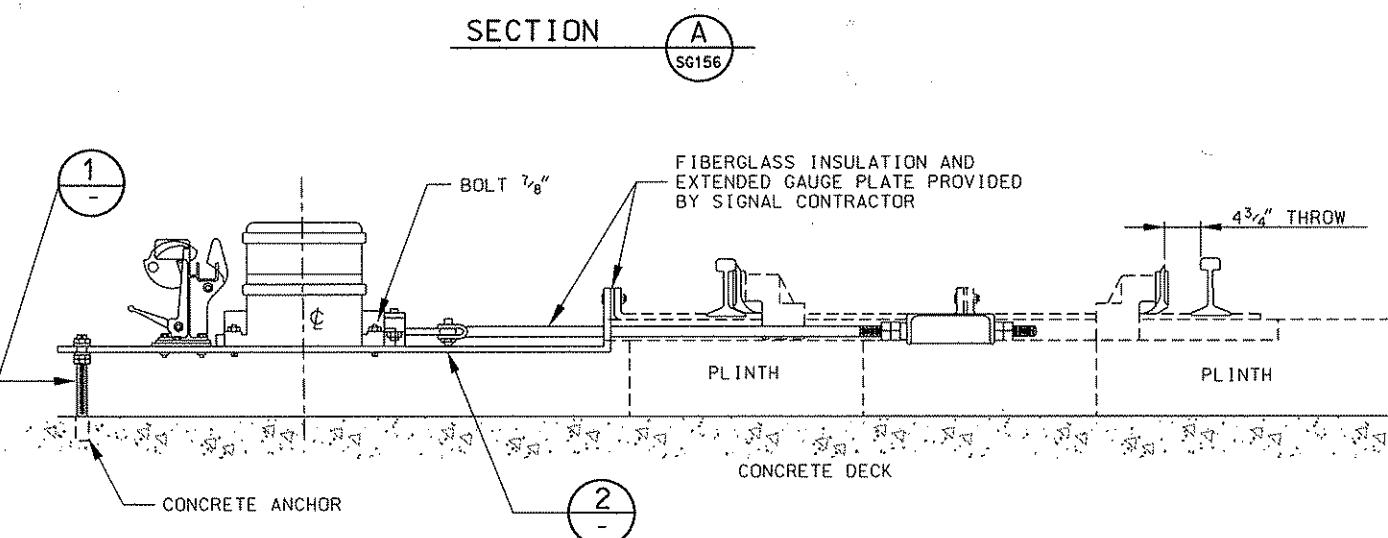
NOTES:

1. SURFACES TO BE SMOOTH, PARALLEL AND PERPENDICULAR TO TOP SURFACE OF MOUNTING PLATE.
2. EXACT LOCATION OF MOUNTING HOLE TO BE DETERMINED AFTER SWITCH MACHINE SELECTED.
3. SADDLE MOUNTING PLATE TO BE SUPPLIED BY CONTRACTOR.
4. SADDLE PLATE TO BE PAINTED FLAT BACK BEFORE INSTALLATION.
5. ALL THREADED RODS, NUTS, LOCK WASHERS TO BE STAINLESS STEEL.

SADDLE PLATE DETAIL

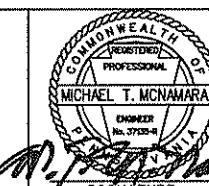


SADDLE PLATE ANCHOR DETAIL



SECTION B SG156

THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.



MICHAEL T. McNAMARA
OWNER
PENNSYLVANIA
NO. 37354

SIGNATURE

APPROVED

DATE

David P. Hause 4/28/08

APR. 28, 2008

DATE

NTS

SCALE

DESIGNED

DRAWN

CHECKED

IN CHARGE

DATE

HT TRAN

ED SPOTTS

CD JONES

APR. 28, 2008

NSC-009

CONTRACT NO.

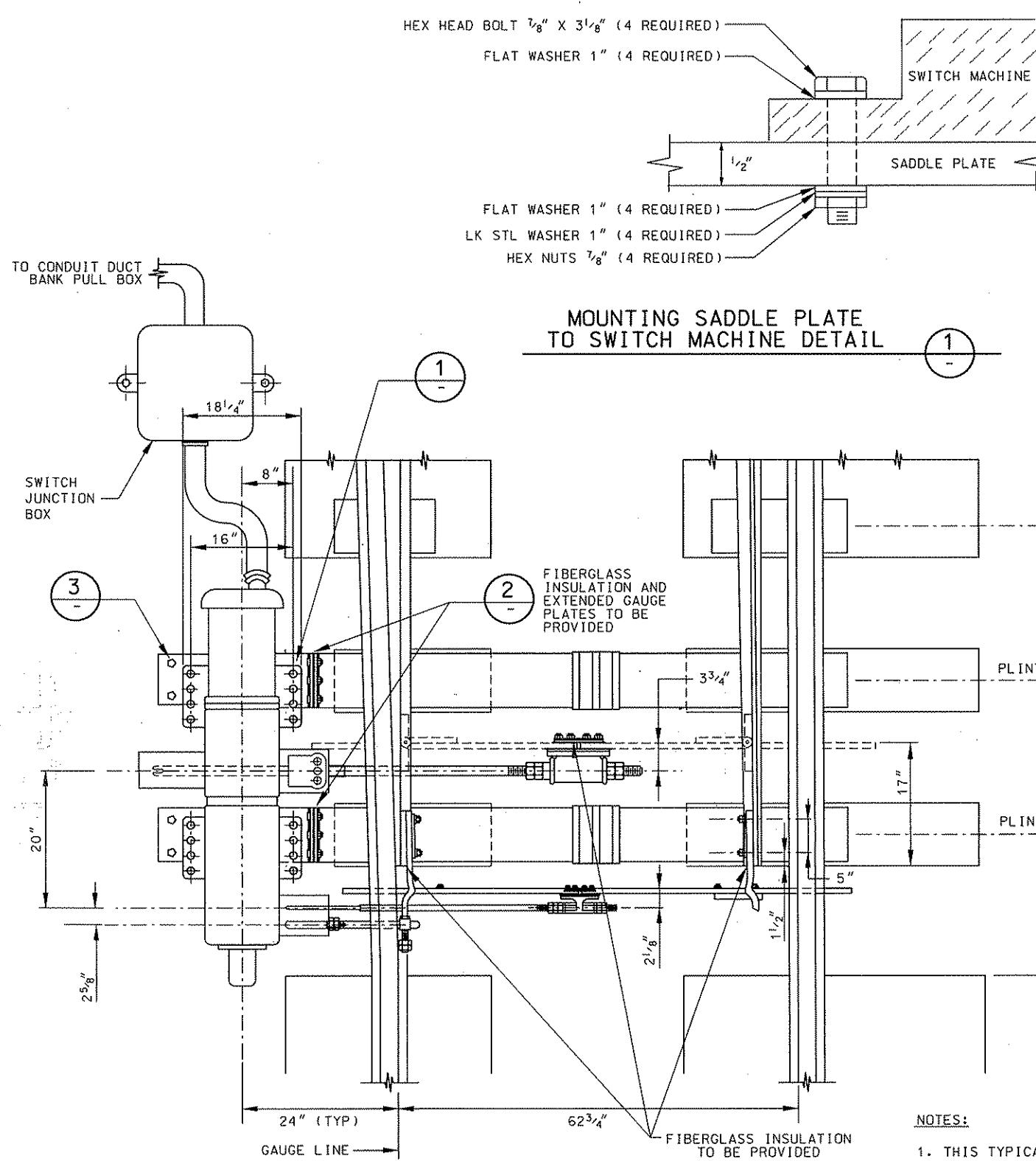
SG158

DWG. NO.

SHT. 408

NO.	DATE	DESCRIPTION	REVISIONS
Gannett Fleming Transit & Rail Systems			

DMJM HARRIS	AECOM	DESIGNED H LAY	PORT AUTHORITY OF ALLEGHENY COUNTY PITTSBURGH
DRAWN HT TRAN			NORTH SHORE CONNECTOR NSC TRAIN SYSTEM (SYSTEM WIDE) TYPICAL
CHECKED ED SPOTTS			DUAL CONTROL POWER SWITCH LAYOUT - DIRECT FIXATION (2 OF 2)
IN CHARGE CD JONES			
DATE APR. 28, 2008			
SCALE NTS			Port Authority
CONTRACT NO. NSC-009			
DWG. NO. SG158			SHT. 408

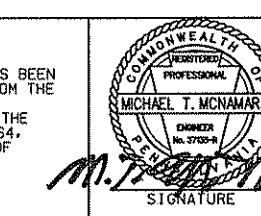


M3 POWER SWITCH LAYOUT - DIRECT FIXATION

- NOTES:
1. THIS TYPICAL TO BE UTILIZED FOR SWITCH MACHINES AT WOOD STREET INTERLOCKING ONLY.
 2. FOR STRAP GUARD END FLARE DETAILS SEE DRAWING GW124. END OF STRAP GUARD SHALL BE AS CLOSE AS POSSIBLE TO THE POINT OF SWITCH WITHOUT INTERFERING WITH SWITCH MACHINE CONNECTING RODS AND POINT DETECTOR ROD. FURNISH TWO (2) PIECES OF STRAP GUARD AHEAD OF SWITCH POINT. LENGTH TO BE 5'-0" TO 7'-0".
 3. THIS PLAN FOR INSTALLATION ONLY. MATERIAL PURCHASED UNDER EARLY PROCUREMENT PACKAGE.

NO.	DATE	DESCRIPTION	REVISIONS
Gannett Fleming Transit & Rail Systems			

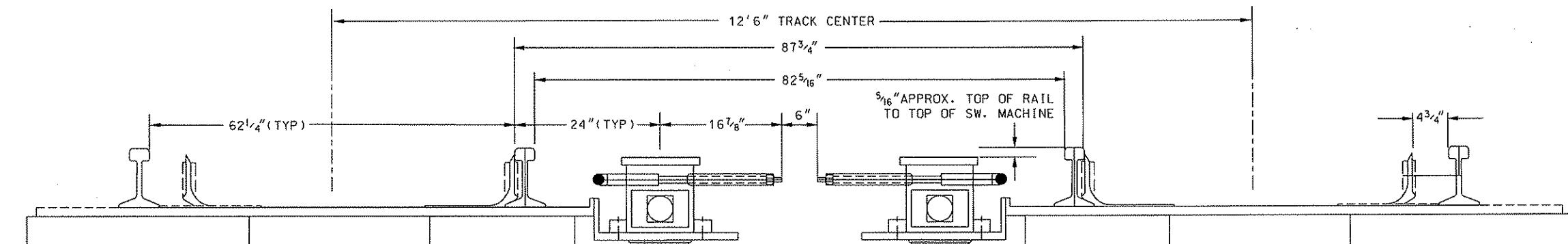
THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.



DMJM HARRIS | AECOM
FOUR GATEWAY CENTER
20TH FLOOR
PITTSBURGH, PA. 15222
CHECKED CD JONES
IN CHARGE CD JONES
DATE APR. 28, 2008
APPROVED *David F. Henry* 4/28/08
SIGNATURE DATE
SCALE NTS

PORT AUTHORITY OF ALLEGHENY COUNTY
PITTSBURGH
NORTH SHORE CONNECTOR
NSC TRAIN SYSTEM (SYSTEM WIDE)
WOOD STREET DOUBLE CROSSOVER
TYPICAL M3 POWER SWITCH LAYOUT - DIRECT FIXATION (1 OF 2)

Port Authority	CONTRACT NO. NSC-009
DWG. NO. SG160	SHT. 409



BACK TO BACK M3 SWITCH MACHINES

NOTES

1. THIS TYPICAL TO BE UTILIZED FOR SWITCH MACHINES AT WOOD STREET INTERLOCKING ONLY.
 2. THIS DRAWING INDICATES TYPICAL INSTALLATION DIMENSIONS FOR A US&S STYLE M3 LOW PROFILE SWITCH MACHINE. ALL DIMENSIONS TO BE VERIFIED BY THE CONTRACTOR.
 3. CONTRACTOR IS RESPONSIBLE FOR ACTUAL MECHANICAL DESIGN OF LAYOUT AND ALL RODS AND THROW BARS.
 4. SEE DRAWING SG160 FOR SWITCH MACHINE MOUNTING DETAIL



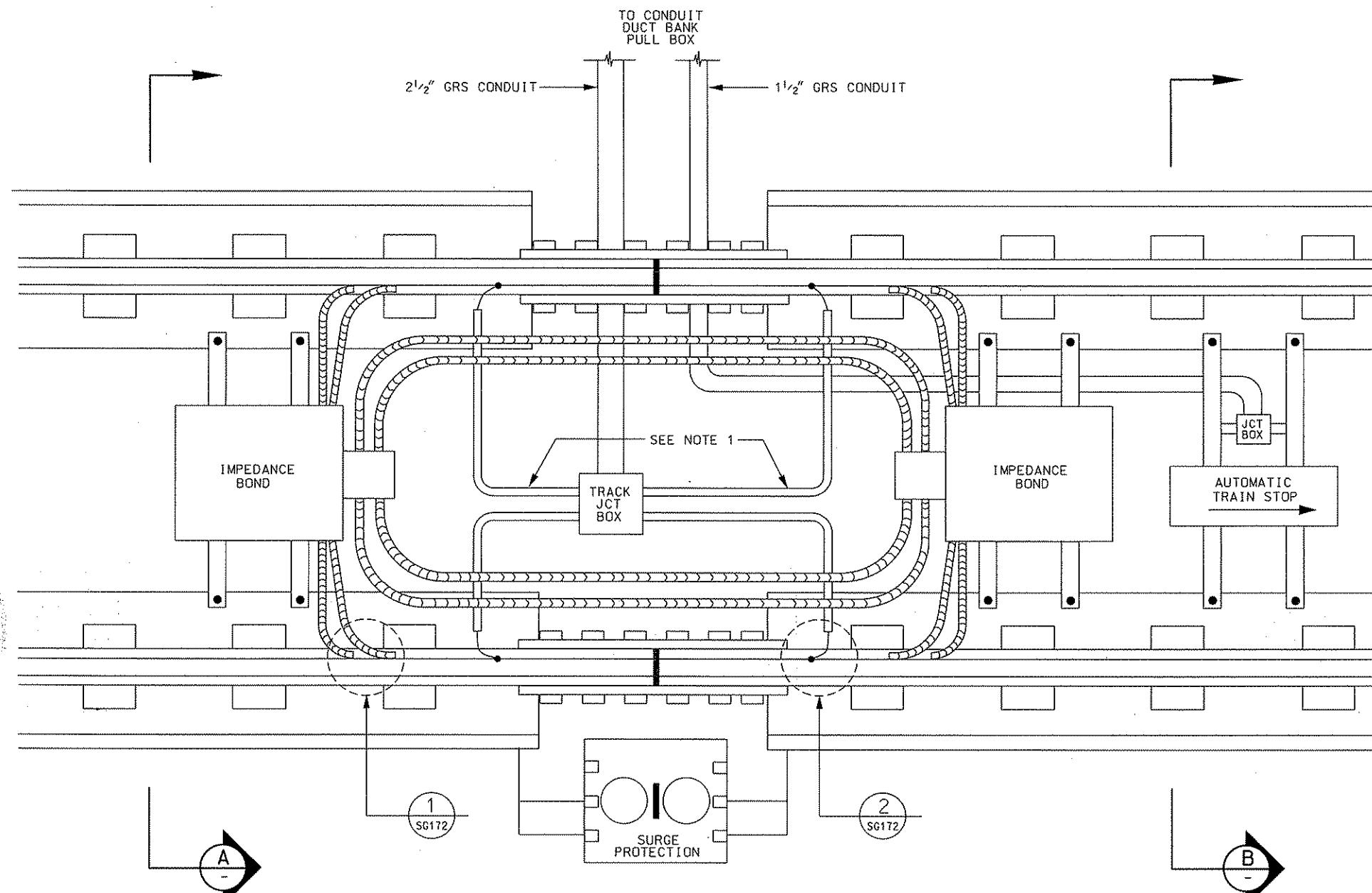
 Gannett Fleming Transit & Rail Systems					
NO.	DATE	DESCRIPTION			
		REVISIONS			

THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.



M	DESIGNED	JF SAMEAN
	DRAWN	JC TRAUM
	CHECKED	CD JONES
	IN CHARGE	CD JONES
B	DATE	APR. 28, 2008
	SCALE	NTS

PORT AUTHORITY OF ALLEGHENY COUNTY	
PITTSBURGH	PENNSYLVANIA
NORTH SHORE CONNECTOR	
NSC TRAIN SYSTEM (SYSTEM WIDE)	
WOOD STREET DOUBLE CROSSOVER	
TYPICAL M3 POWER SWITCH LAYOUT - DIRECT FIXATION (2 OF 2)	
Port Authority	CONTRACT NO. NSC-009
	PHNU NO. SC161

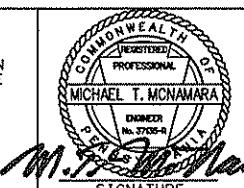


DOUBLE BOND LAYOUT - DIRECT FIXATION

NOTES:

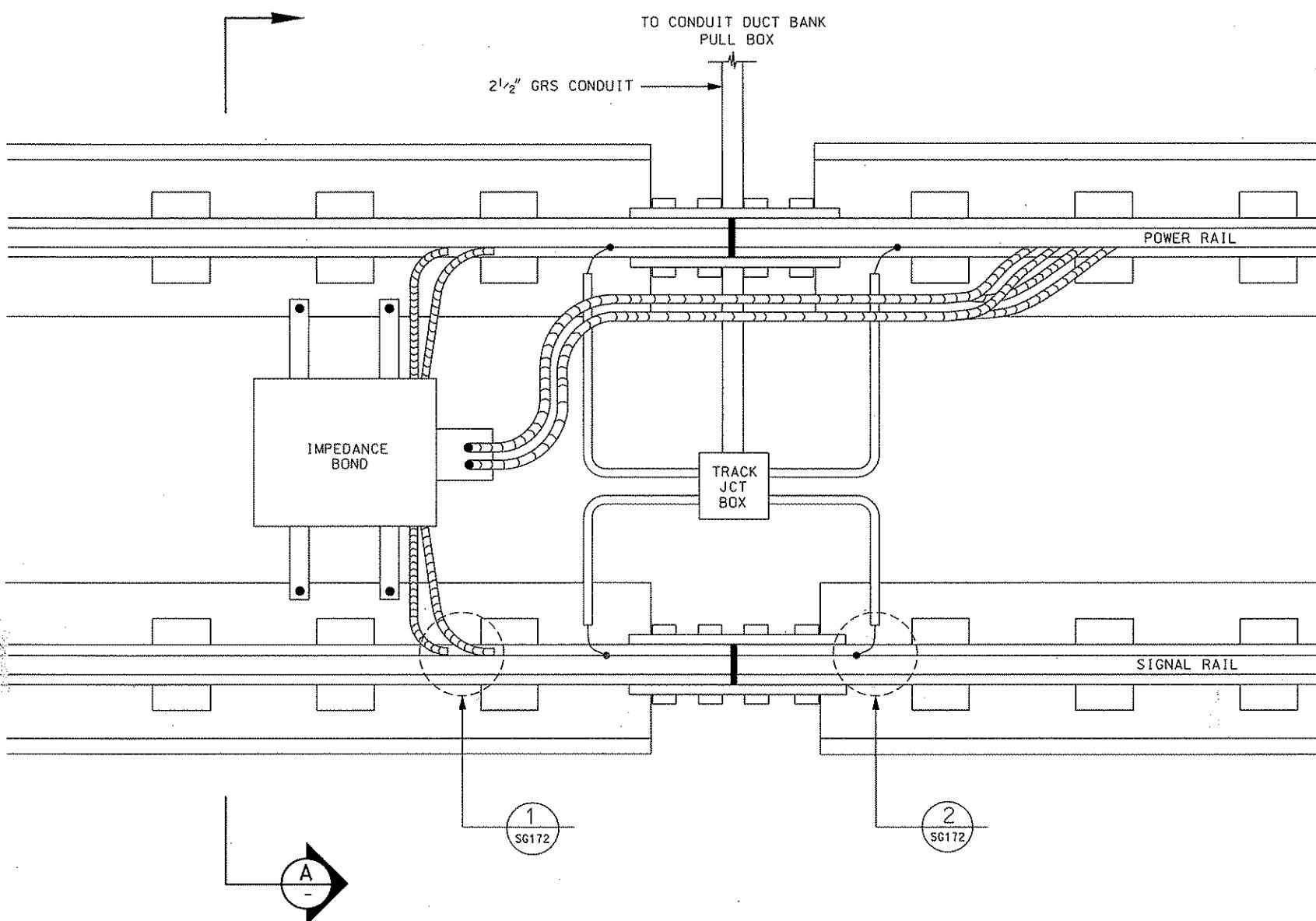
1. TRACK WIRES FROM JUNCTION BOX TO RAIL TO BE IN 1" GRS CONDUIT.
2. SEE DRAWING SG172 FOR IMPEDANCE BOND CABLE SIZES.
3. SEE DRAWING SG172 FOR TRACK BONDING DETAIL.

THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.



DMJM HARRIS | AECOM
FOUR GATEWAY CENTER
20TH FLOOR
PITTSBURGH, PA. 15222
[Handwritten signatures]
APPROVED DATE
APR. 28, 2008

PORT AUTHORITY OF ALLEGHENY COUNTY PITTSBURGH	
NORTH SHORE CONNECTOR NSC TRAIN SYSTEM (SYSTEM WIDE) TYPICAL IMPEDANCE BOND LAYOUT - DOUBLE	
Port Authority	CONTRACT NO. NSC-009 DWG. NO. SG164 SHT. 4/11



SINGLE BOND LAYOUT - DIRECT FIXATION

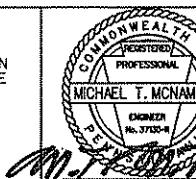
NOTES:

1. TRACK WIRES FROM JUNCTION BOX TO RAIL TO BE IN 1" GRS CONDUIT.
2. SEE DRAWING SG172 FOR IMPEDANCE BOND CABLE SIZES.
3. SEE DRAWING SG172 FOR TRACK BOND DETAILS.

Gannett Fleming
Transit & Rail Systems

NO.	DATE	DESCRIPTION
REVISIONS		

THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.



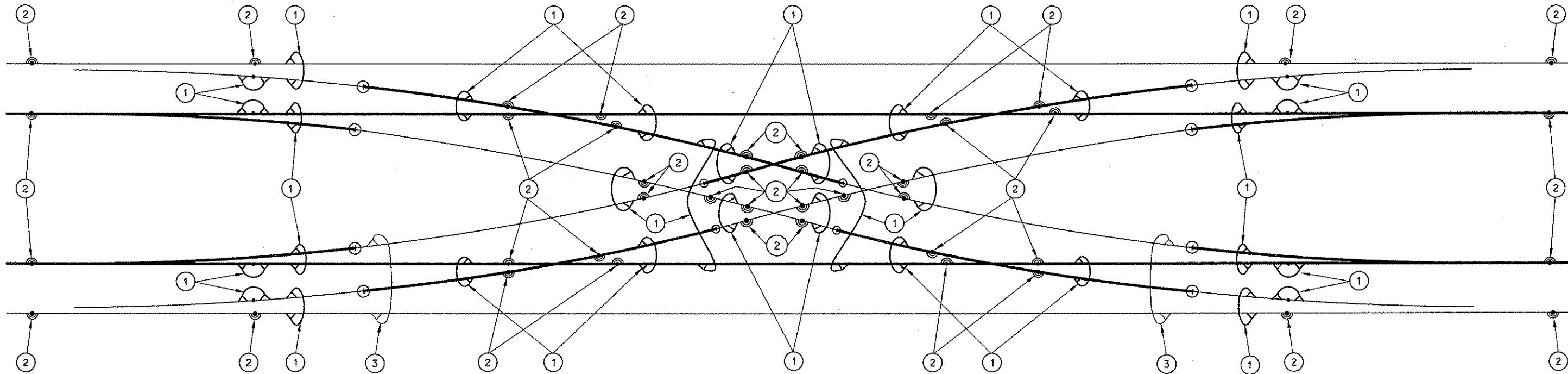
Signature: *[Handwritten signature]*

APPROVED *[Handwritten signature]* DATE *4/28/08*

DMJM HARRIS | AECOM
FOUR GATEWAY CENTER
20TH FLOOR
PITTSBURGH, PA. 15222
IN CHARGE CD JONES
DATE APR. 28, 2008

DESIGNED H LAY
DRAWN HT TRAN
CHECKED ED SPOTTS
IN CHARGE CD JONES
DATE APR. 28, 2008
SCALE NTS

PORT AUTHORITY OF ALLEGHENY COUNTY
Pittsburgh, Pennsylvania
NORTH SHORE CONNECTOR
NSC TRAIN SYSTEM (SYSTEM WIDE)
TYPICAL
IMPEDANCE BOND LAYOUT - SINGLE
Port Authority
Contract No. NSC-009
DWG. NO. SG166 Sht. 4-12



ALLEGHENY INTERLOCKING DIAMOND CROSS-OVER SWITCH BONDING

EQUIPMENT:

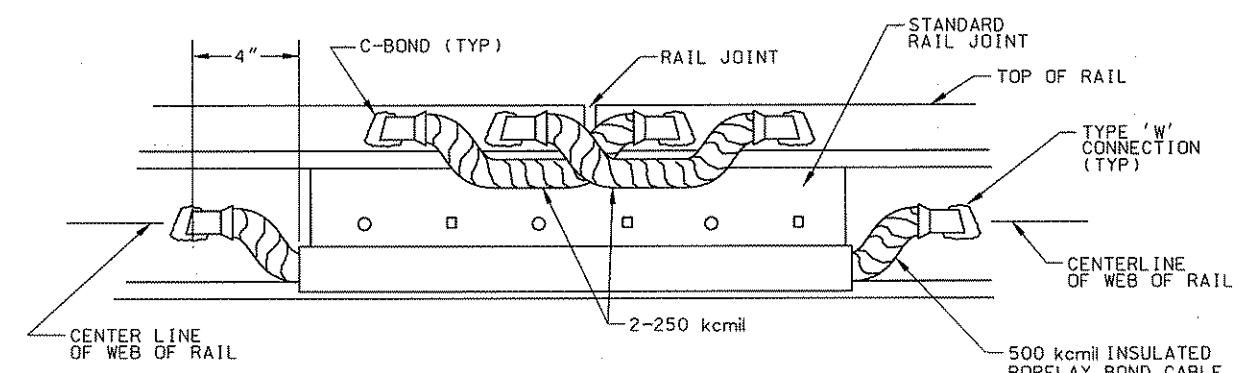
- ① DUAL 500 kcmil FROG OR CROSSBOND CABLE WITH EXOTHERMIC WELDS.
- ② TWO 250 kcmil BONDS SHALL BE EXOTHERMICALLY WELDED TO THE FIELD SIDE OF THE RAIL HEAD WITHIN THE LIMITS OF A JOINT BAR, PER DETAIL 1, AND ONE 500 kcmil BOND SHALL BE EXOTHERMICALLY WELDED TO THE FIELD SIDE OF THE WEB OF THE RAILS AT THE CENTERLINE OF THE WEB 4 INCHES BEYOND THE JOINT BARS AS SHOWN IN DETAIL 1.
- ③ DUAL #6 BONDSTRAND CROSSBOND CABLE, WELDED.

LEGEND:

- NEGATIVE RETURN RAIL
- SIGNAL RAIL
- + INSULATED RAIL JOINTS
- NEGATIVE RETURN OR SIGNAL RAIL JOINT WITH 2-250 kcmil, TYPE 'C' WELDED RAIL-HEAD BONDS AND 1-500 kcmil ROPELAY INSULATED BOND CABLE WELDED TO THE FIELD SIDE OF THE WEB OF THE RAILS AT THE CENTERLINE OF THE WEB 4 INCHES BEYOND THE ENDS OF THE JOINT BAR AS SHOWN IN DETAIL 1.
- WEB-OF-RAIL WELDED CONNECTION FOR 1000 kcmil OR DUAL 500 kcmil BONDS.

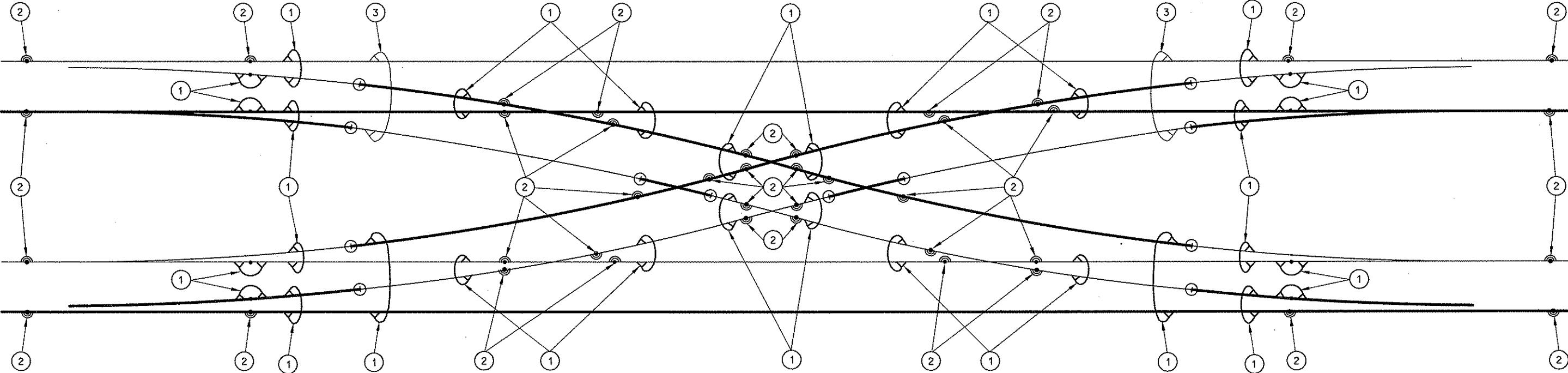
NOTES:

1. THE CONTRACTOR SHALL PROVIDE NEGATIVE RETURN RAIL BONDING ALL AROUND NEGATIVE-RETURN AND SIGNAL-RAIL NON-INSULATED JOINTS WITHIN INTERLOCKING LIMITS. THIS BONDING SHALL CONSIST OF TWO 250 kcmil, TYPE 'C' WELDED RAIL-HEAD BONDS AND ONE 500 kcmil, TYPE 'W' WELDED RAIL WEB BOND WHEREVER POSSIBLE.
2. THE CONTRACTOR SHALL PROVIDE 1000 kcmil OR DUAL 500 kcmil WELDED BONDS FOR NEGATIVE-RETURN PURPOSES.



TYPICAL RAIL JOINT BONDING DETAIL

<p>Gannett Fleming Transit & Rail Systems</p>						THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.		<div style="text-align: center;"> PROFESSIONAL REGISTRATION MICHAEL T. McNAMARA <small>OWNER / MEMBER</small> </div>	<div style="text-align: center;"> DMJM HARRIS <small>FOUR GATEWAY CENTER 20TH FLOOR PITTSBURGH, PA. 15222</small> </div>	<div style="text-align: center;"> AECOM <small>IN CHARGE CD JONES</small> </div>	DESIGNED H LAY DRAWN HT TRAN	PORT AUTHORITY OF ALLEGHENY COUNTY <small>PITTSBURGH, PENNSYLVANIA</small>	
						DRAWN HT TRAN	NORTH SHORE CONNECTOR NSC TRAIN SYSTEM (SYSTEM WIDE) ALLEGHENY INTERLOCKING SWITCH BONDING - DIAMOND CROSSOVER						
NO. DATE	DESCRIPTION	APPROVED DATE	SIGNATURE	APPROVED DATE	Port Authority	CONTRACT NO. NSC-009							
NO. DATE	DESCRIPTION	APPROVED DATE	SIGNATURE	APPROVED DATE	Port Authority	CONTRACT NO. NSC-009							
NO. DATE	DESCRIPTION	APPROVED DATE	SIGNATURE	APPROVED DATE	Port Authority	CONTRACT NO. NSC-009							
NO. DATE	DESCRIPTION	APPROVED DATE	SIGNATURE	APPROVED DATE	Port Authority	CONTRACT NO. NSC-009							
NO. DATE	DESCRIPTION	APPROVED DATE	SIGNATURE	APPROVED DATE	Port Authority	CONTRACT NO. NSC-009							
NO. DATE	DESCRIPTION	APPROVED DATE	SIGNATURE	APPROVED DATE	Port Authority	CONTRACT NO. NSC-009							
NO. DATE	DESCRIPTION	APPROVED DATE	SIGNATURE	APPROVED DATE	Port Authority	CONTRACT NO. NSC-009							
NO. DATE	DESCRIPTION	APPROVED DATE	SIGNATURE	APPROVED DATE	Port Authority	CONTRACT NO. NSC-009							
NO. DATE	DESCRIPTION	APPROVED DATE	SIGNATURE	APPROVED DATE	Port Authority	CONTRACT NO. NSC-009							
NO. DATE	DESCRIPTION	APPROVED DATE	SIGNATURE	APPROVED DATE	Port Authority	CONTRACT NO. NSC-009							
NO. DATE	DESCRIPTION	APPROVED DATE	SIGNATURE	APPROVED DATE	Port Authority	CONTRACT NO. NSC-009							
NO. DATE	DESCRIPTION	APPROVED DATE	SIGNATURE	APPROVED DATE	Port Authority	CONTRACT NO. NSC-009							
NO. DATE	DESCRIPTION	APPROVED DATE	SIGNATURE	APPROVED DATE	Port Authority	CONTRACT NO. NSC-009							
NO. DATE	DESCRIPTION	APPROVED DATE	SIGNATURE	APPROVED DATE	Port Authority	CONTRACT NO. NSC-009							
NO. DATE	DESCRIPTION	APPROVED DATE	SIGNATURE	APPROVED DATE	Port Authority	CONTRACT NO. NSC-009							
NO. DATE	DESCRIPTION	APPROVED DATE	SIGNATURE	APPROVED DATE	Port Authority	CONTRACT NO. NSC-009							
NO. DATE	DESCRIPTION	APPROVED DATE	SIGNATURE	APPROVED DATE	Port Authority	CONTRACT NO. NSC-009							
NO. DATE	DESCRIPTION	APPROVED DATE	SIGNATURE	APPROVED DATE	Port Authority	CONTRACT NO. NSC-009							
NO. DATE	DESCRIPTION	APPROVED DATE	SIGNATURE	APPROVED DATE	Port Authority	CONTRACT NO. NSC-009							
NO. DATE	DESCRIPTION	APPROVED DATE	SIGNATURE	APPROVED DATE	Port Authority	CONTRACT NO. NSC-009							
NO. DATE	DESCRIPTION	APPROVED DATE	SIGNATURE	APPROVED DATE	Port Authority	CONTRACT NO. NSC-009							
NO. DATE	DESCRIPTION	APPROVED DATE	SIGNATURE	APPROVED DATE	Port Authority	CONTRACT NO. NSC-009							
NO. DATE	DESCRIPTION	APPROVED DATE	SIGNATURE	APPROVED DATE	Port Authority	CONTRACT NO. NSC-009							
NO. DATE	DESCRIPTION	APPROVED DATE	SIGNATURE	APPROVED DATE	Port Authority	CONTRACT NO. NSC-009							
NO. DATE	DESCRIPTION	APPROVED DATE	SIGNATURE	APPROVED DATE	Port Authority	CONTRACT NO. NSC-009							
NO. DATE	DESCRIPTION	APPROVED DATE	SIGNATURE	APPROVED DATE	Port Authority	CONTRACT NO. NSC-009							
NO. DATE	DESCRIPTION	APPROVED DATE	SIGNATURE	APPROVED DATE	Port Authority	CONTRACT NO. NSC-009							
NO. DATE	DESCRIPTION	APPROVED DATE	SIGNATURE	APPROVED DATE	Port Authority								



WOOD STREET INTERLOCKING DIAMOND CROSS-OVER SWITCH BONDING

EQUIPMENT:

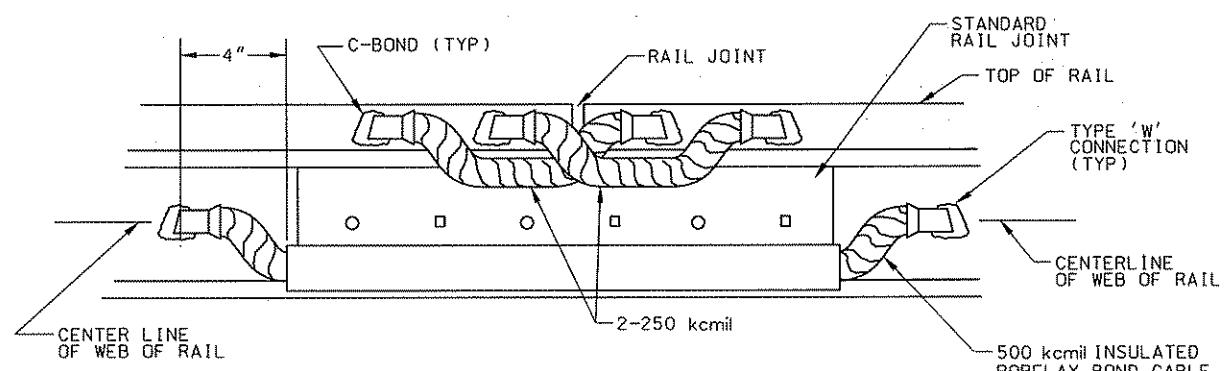
- ① DUAL 500 kcmil FROG OR CROSSBOND CABLE WITH EXOTHERMIC WELDS.
- ② TWO 250 kcmil BONDS SHALL BE EXOTHERMICALLY WELDED TO THE FIELD SIDE OF THE RAIL HEAD WITHIN THE LIMITS OF A JOINT BAR, PER DETAIL 1, AND ONE 500 kcmil BOND SHALL BE EXOTHERMICALLY WELDED TO THE FIELD SIDE OF THE WEB OF THE RAILS AT THE CENTERLINE OF THE WEB 4 INCHES BEYOND THE JOINT BARS AS SHOWN IN DETAIL 1.
- ③ DUAL #6 BONDSTRAND CROSSBOND CABLE, WELDED.

LEGEND:

- NEGATIVE RETURN RAIL
- SIGNAL RAIL
- +— INSULATED RAIL JOINTS
- +— NEGATIVE RETURN OR SIGNAL RAIL JOINT WITH 2-250 kcmil, TYPE 'C' WELDED RAIL-HEAD BONDS AND 1-500 kcmil ROPELAY INSULATED BOND CABLE WELDED TO THE FIELD SIDE OF THE WEB OF THE RAILS AT THE CENTERLINE OF THE WEB 4 INCHES BEYOND THE ENDS OF THE JOINT BAR AS SHOWN IN DETAIL 1.
- +— WEB-OF-RAIL WELDED CONNECTION FOR 1000 kcmil OR DUAL 500 kcmil BONDS.

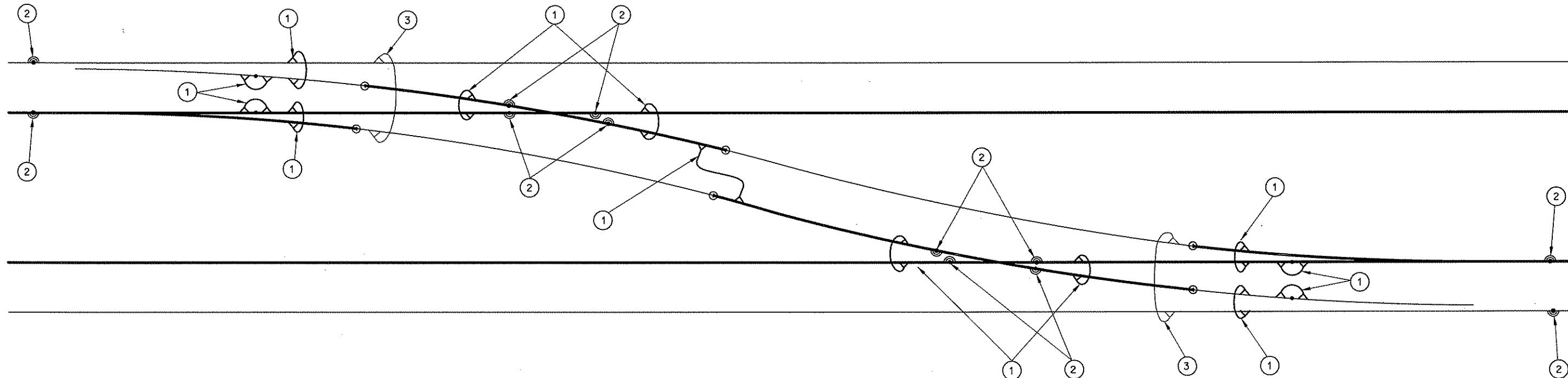
NOTES:

1. THE CONTRACTOR SHALL PROVIDE NEGATIVE RETURN RAIL BONDING ALL AROUND NEGATIVE-RETURN AND SIGNAL-RAIL NON-INSULATED JOINTS WITHIN INTERLOCKING LIMITS. THIS BONDING SHALL CONSIST OF TWO 250 kcmil, TYPE 'C' WELDED RAIL-HEAD BONDS AND ONE 500 kcmil, TYPE 'W' WELDED RAIL WEB BOND WHEREVER POSSIBLE.
2. THE CONTRACTOR SHALL PROVIDE 1000 kcmil OR DUAL 500 kcmil WELDED BONDS FOR NEGATIVE-RETURN PURPOSES.



TYPICAL RAIL JOINT BONDING DETAIL

 Gannett Fleming Transit & Rail Systems				 PROFESSIONAL REGISTERED MICHAEL T. McNAMARA OWNER No. 3739-R	DMJM HARRIS AECOM FOUR GATEWAY CENTER 20TH FLOOR PITTSBURGH, PA. 15222	DESIGNED	H LAY	PORT AUTHORITY OF ALLEGHENY COUNTY PITTSBURGH NORTH SHORE CONNECTOR NSC TRAIN SYSTEM (SYSTEM WIDE) WOOD STREET INTERLOCKING SWITCH BONDING - DIAMOND CROSSOVER	
	NO.	DATE	DESCRIPTION			DRAWN	H TIAN		
			REVISIONS			SIGNED	ED SPOTTS		
						IN CHARGE	CD JONES		
						DATE	APR. 28, 2008		
						SCALE	NTS		
						Port Authority CONTRACT NO. NSC-009 DWG. NO. SG169 SHT. 414			



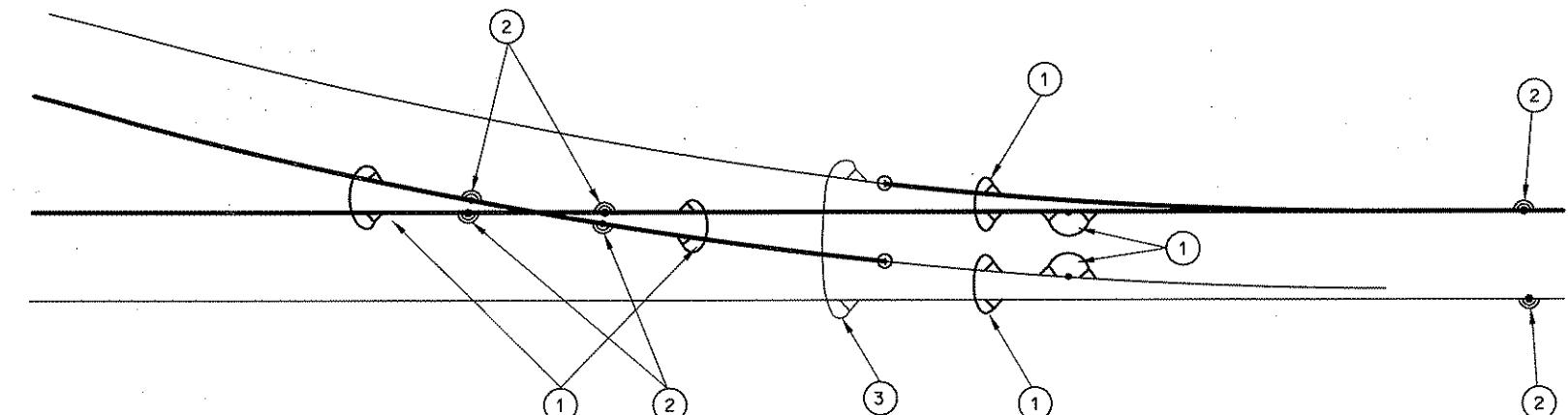
TYPICAL CROSS-OVER SWITCH BONDING

EQUIPMENT:

- ① DUAL 500 kcmil FROG OR CROSSBOND CABLE WITH EXOTHERMIC WELDS.
- ② TWO 250 kcmil BONDS SHALL BE EXOTHERMICALLY WELDED TO THE FIELD SIDE OF THE RAIL HEAD WITHIN THE LIMITS OF A JOINT BAR, PER DETAIL 1 (OF DWG NO. SG168), AND ONE 500 kcmil BOND SHALL BE EXOTHERMICALLY WELDED TO THE FIELD SIDE OF THE WEB OF THE RAILS AT THE CENTERLINE OF THE WEB 4 INCHES BEYOND THE JOINT BARS AS SHOWN IN DETAIL 1 (DWG# SG168).
- ③ DUAL #6 BONDSTRAND CROSSBOND CABLE, WELDED.

LEGEND:

- NEGATIVE RETURN RAIL
- SIGNAL RAIL
- + INSULATED RAIL JOINTS
- NEGATIVE RETURN OR SIGNAL RAIL JOINT WITH 2-250 kcmil, TYPE 'C' WELDED RAIL-HEAD BONDS AND 1-500 kcmil ROPELAY INSULATED BOND CABLE WELDED TO THE FIELD SIDE OF THE WEB OF THE RAILS AT THE CENTERLINE OF THE WEB 4 INCHES BEYOND THE ENDS OF THE JOINT BAR AS SHOWN IN DETAIL 1 (DWG# SG168).
- WEB-OF-RAIL WELDED CONNECTION FOR 1000 kcmil OR DUAL 500 kcmil BONDS.



TYPICAL TURNOUT SWITCH BONDING

NOTES:

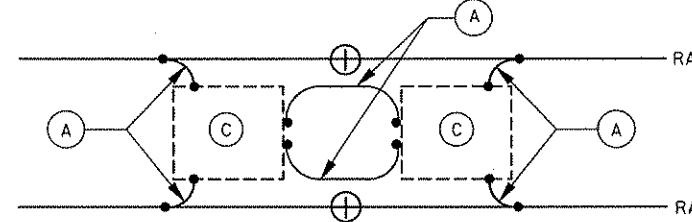
1. THE CONTRACTOR SHALL PROVIDE NEGATIVE RETURN RAIL BONDING ALL AROUND NEGATIVE-RETURN AND SIGNAL-RAIL NON-INSULATED JOINTS WITHIN INTERLOCKING LIMITS. THIS BONDING SHALL CONSIST OF TWO 250 kcmil, TYPE 'C' WELDED RAIL-HEAD BONDS AND ONE 500 kcmil, TYPE 'W' WELDED RAIL WEB BOND WHEREVER POSSIBLE.
2. THE CONTRACTOR SHALL PROVIDE 1000 kcmil OR DUAL 500 kcmil WELDED BONDS FOR NEGATIVE-RETURN PURPOSES.

 Gannett Fleming Transit & Rail Systems				<small>THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.</small>	 MICHAEL T. McNAMARA PENNSYLVANIA PROFESSIONAL ENGINEER REGISTRATION BOARD LICENSE NO. 3705-B	DMJM HARRIS AECOM	DESIGNED	H LAY	PORT AUTHORITY OF ALLEGHENY COUNTY PITTSBURGH
							DRAWN	HIT TRAN	
						CHECKED	ED SPOTTS		NORTH SHORE CONNECTOR NSC TRAIN SYSTEM (SYSTEM WIDE)
						IN CHARGE	CD JONES		TYPICAL SWITCH BONDING - CROSSOVER
						DATE	APR. 28, 2008		
						SCALE	NTS		
					SIGNATURE	APPROVED	DATE		
NO.	DATE	DESCRIPTION							
		REVISIONS							

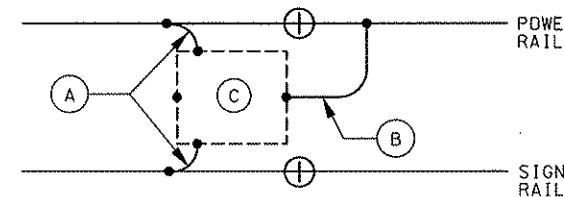
Michael T. McNamara
4/28/08

Port Authority

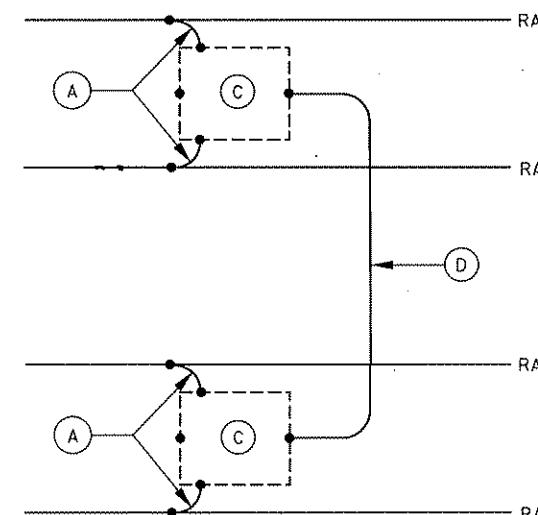
CONTRACT NO. NSC-009
DWG. NO. SG170 SHT. 415



POWER BONDING AT JUNCTION WITH DOUBLE RAIL TRACK CIRCUIT



POWER BONDING AT JUNCTION WITH SINGLE RAIL TRACK CIRCUIT

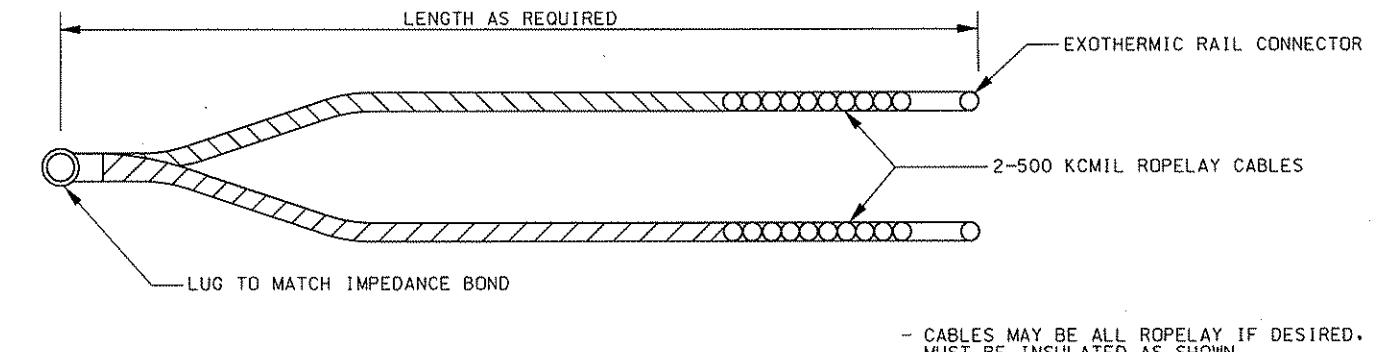
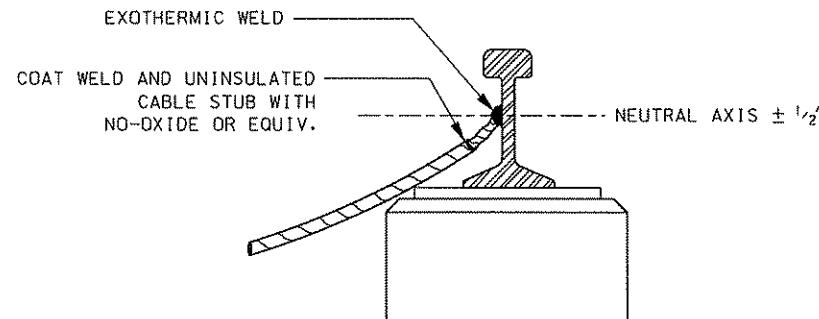


POWER BONDING KEY

- (A) 2-500 kcmil - RAIL AXIS WELD
- (B) 4-500 kcmil
- (C) IMPEDANCE BOND
- (D) 2-1000 kcmil
- (+) INSULATED JOINT

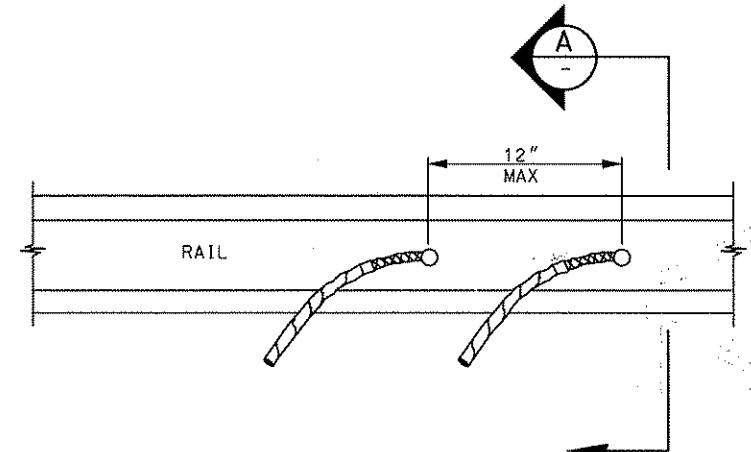
CROSS BONDING FOR TWO TRACKS

 Gannett Fleming Transit & Rail Systems			<small>THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.</small>	 MICHAEL T. MCNAMARA PROFESSIONAL ENGINEER NO. 37054 PENNSYLVANIA OWNER	DMJM HARRIS AECOM	DESIGNED DRAWN H. LAY H. TRAN	PORT AUTHORITY OF ALLEGHENY COUNTY PITTSBURGH	
						CHECKED IN CHARGE ED SPOTTS CD JONES	NORTH SHORE CONNECTOR NSC TRAIN SYSTEM (SYSTEM WIDE) TYPICAL POWER AND TRACK BONDING SCHEMATICS	
NO. DATE REVISIONS	DESCRIPTION	 Michael T. McNamara 4/28/08	APPROVED DATE	DATE APR. 28, 2008	SCALE NTS	Port Authority Contract No. NSC-009 DWG. No. SG171 Sht. 416		



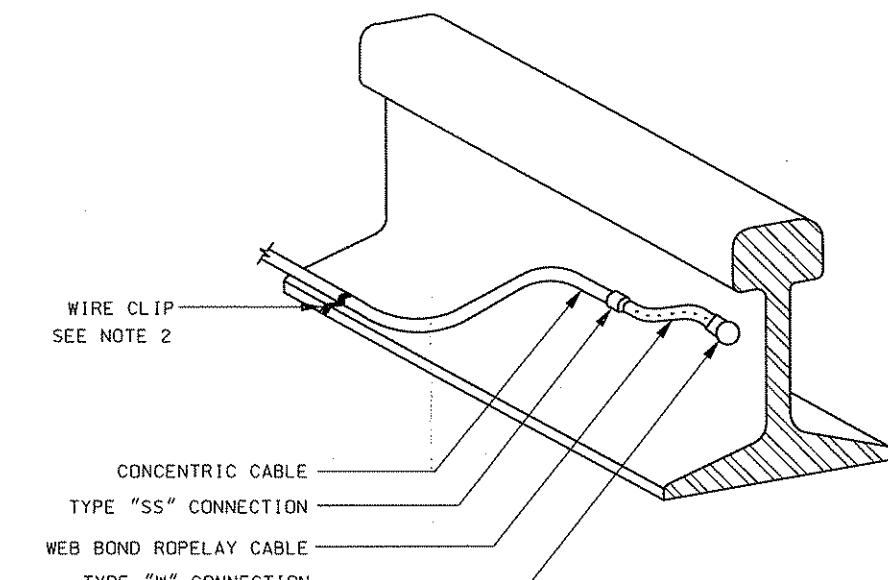
SECTION A

IMPEDANCE BOND CONNECTION DETAIL



NOTE:

PLACEMENT OF CABLES SHALL NOT INTERFERE WITH TRACK TAMPING OPERATION



RAIL AXIS WELD DETAIL

1

WEB RAIL CONNECTION DETAIL

2

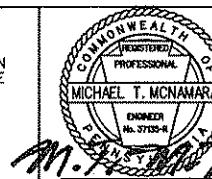
NOTES:

- ALL WELDS TO BE EXOTHERMIC WELDS.
- RAIL CLIPS SHALL BE USED TO PREVENT INTERFERENCE WITH TRACK TAMPING OPERATION.
- ALL 500 KCMIL CABLE ARE ROPELAY.
- THE AREA WHERE BOND IS TO BE PLACED TO BE FREE OF RUST, GREASE AND OIL.

Gannett Fleming
Transit & Rail Systems

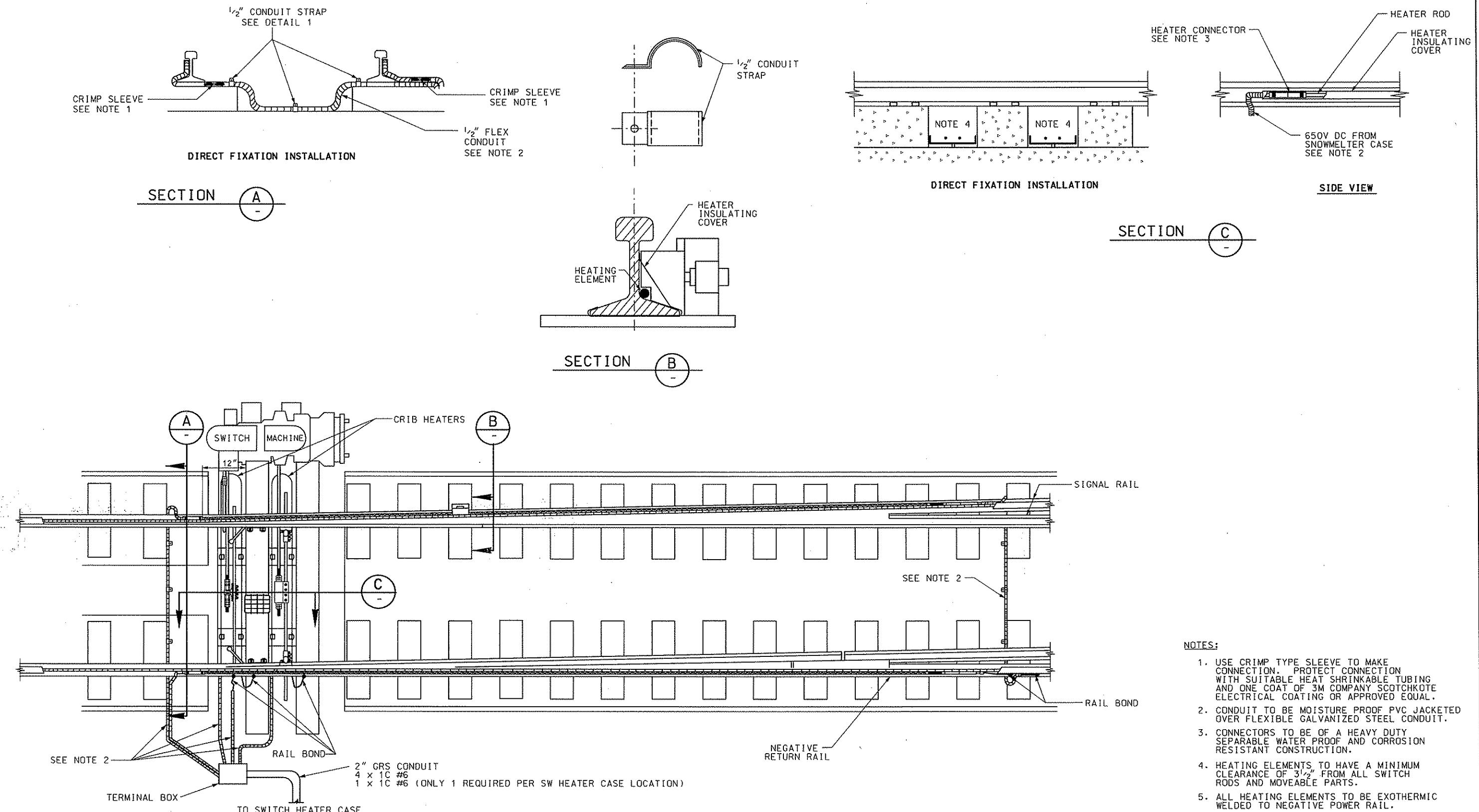
NO.	DATE	DESCRIPTION	
		REVISIONS	

THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.



DMJM HARRIS | AECOM
FOUR GATEWAY CENTER
20TH FLOOR
PITTSBURGH, PA. 15222
CHECKED ED SPOTTS
IN CHARGE CD JONES
DATE APR. 28, 2008
SIGNATURE *[Signature]* APPROVED *[Signature]* DATE *4/28/08*

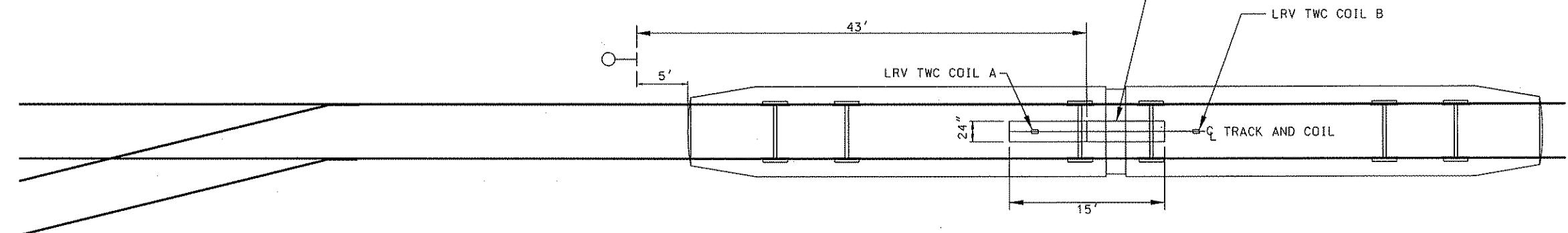
PORT AUTHORITY OF ALLEGHENY COUNTY
Pittsburgh, Pennsylvania
NORTH SHORE CONNECTOR
NSC TRAIN SYSTEM (SYSTEM WIDE)
TYPICAL
POWER AND TRACK BOND DETAILS
Port Authority
Contract No. NSC-009
Dwg. No. SG172 Sht. 417



TYPICAL SWITCH HEATER PLAN

 Gannett Fleming Transit & Rail Systems			<p>THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.</p>	 DMJM HARRIS AECOM FOUR GATEWAY CENTER 20TH FLOOR PITTSBURGH, PA. 15222 SIGNED M.T. MCNAMARA ENGINEER No. 1025-A APPROVED D. Spotts DATE APR. 28, 2008 SIGNATURE $\begin{matrix} \text{Michael T. McNamara} \\ \text{D. Spotts} \end{math}$ $4/28/08$	DESIGNED H LAY	PORT AUTHORITY OF ALLEGHENY COUNTY PITTSBURGH NORTH SHORE CONNECTOR NSC TRAIN SYSTEM (SYSTEM WIDE) TYPICAL SWITCH HEATER ARRANGEMENT
	NO. DATE	DESCRIPTION		DRAWN H. TRAN	CHECKED ED SPOTTS	
		REVISIONS		IN CHARGE CD JONES	DATE APR. 28, 2008	
				SCALE NTS		Port Authority CONTRACT NO. NSC-009 DWG. NO. SG174 SHT. 418

COIL TURN #12 WIRE
IN SCHEDULE-40 PVC PIPE LOCATED
SO LRV TRANSPONDER IS OVER COIL
WHEN LRV IS STOPPED WITHIN 5 FEET OF SIGNAL



TYPICAL TWC COIL LOOP LAYOUT AT INTERLOCKING

NOTES:

- ALL DIMENSIONS ARE IN INCHES AND ARE PROVIDED AS REPRESENTATIVE EXAMPLES OF DIMENSIONS TO BE SHOWN ON AS-BUILT DRAWINGS AND ARE NOT TO BE CONSTRUED TO APPLY TO ANY SPECIFIC LOCATION.

THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.



DMJM HARRIS

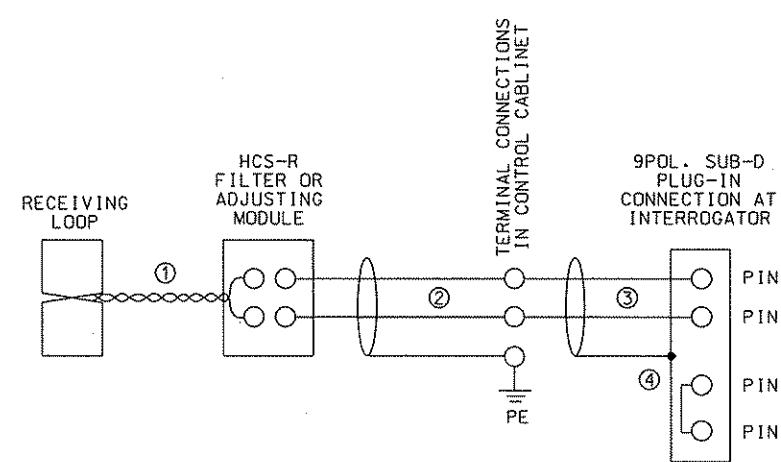
AECOM

DESIGNED ED SPOTTS
DRAWN HT TRAN
CHECKED JF SAMEAN
IN CHARGE CD JONES
DATE APR. 28, 2008
SCALE NTS

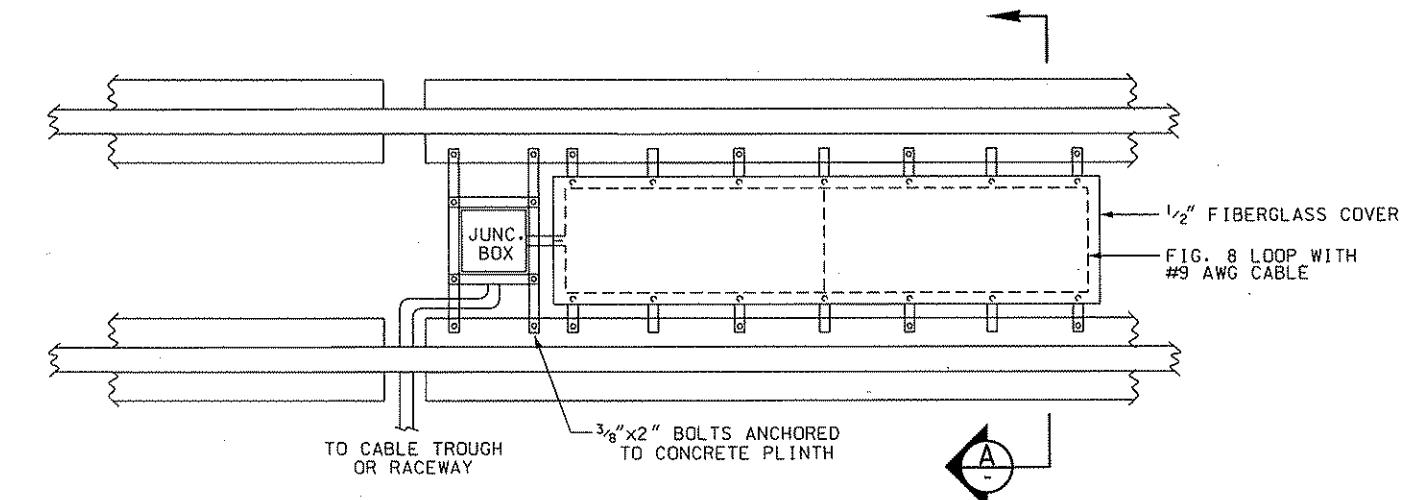
PORT AUTHORITY OF ALLEGHENY COUNTY
Pittsburgh, Pennsylvania
NORTH SHORE CONNECTOR
NSC TRAIN SYSTEM (SYSTEM WIDE)
TYPICAL
TWC LOOP LAYOUT
Port Authority
Contract No. NSC-009
DWG. No. SG176
Sht. 419

Gannett Fleming
Transit & Rail Systems

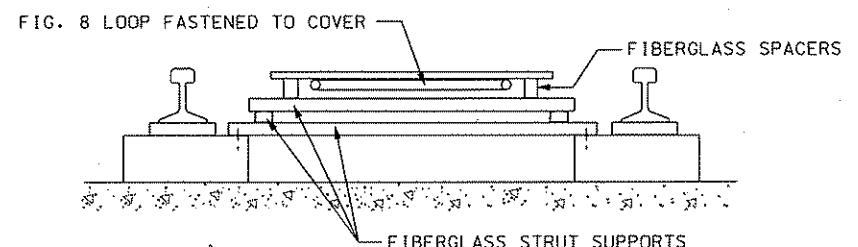
NO.	DATE	DESCRIPTION	REVISIONS
-----	------	-------------	-----------



ELECTRICAL CONNECTION OF RECEIVING LOOP



TWC LOOP LAYOUT



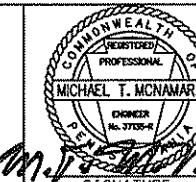
SECTION A

LEGENDS:

- ① RECEIVING LOOP CABLE, MAX. LENGTH 33 FT. TWISTED.
TYPE: H07-VK, 1C #9 AWG.
 - ② SHIELDED CONNECTING CABLE, MAX. LENGTH 1200 FT.
TYPE: LIY(C)Y, 2C #12 AWG SHIELDED CABLE
 - ③ CONNECTING CABLE HCS-R-R2 or 5, FACTORY MADE, LENGTH
6.5 FT - EDV - Nr.45.210.041 or
16.4 FT - EDV - Nr.45210.042
 - ④ SHIELDED CONNECTING CABLE ③ CONNECTED WITH THE CASING
OF THE 9 PIN SUB-D PLUG.



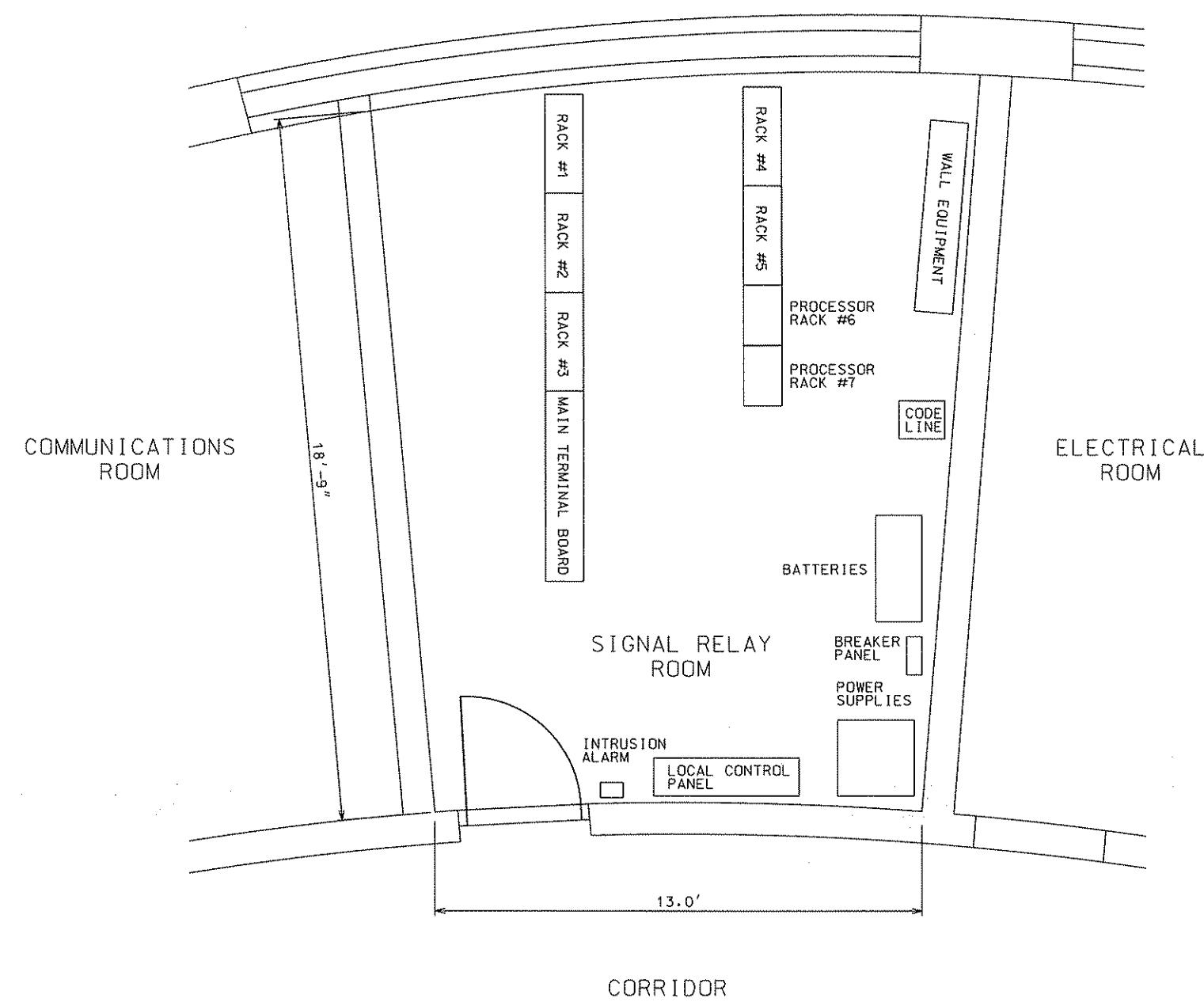
THE PREPARATION OF THIS DOCUMENT HAS BEEN
FINANCED IN PART THROUGH A GRANT FROM THE
FEDERAL TRANSIT ADMINISTRATION, U.S.
DEPARTMENT OF TRANSPORTATION, UNDER THE
URBAN MASS TRANSPORTATION ACT OF 1964,
AS AMENDED, FOR THE PORT AUTHORITY OF
ALLEGHENY COUNTY, PENNSYLVANIA.



DMJM HARRIS | **AECOM**
FOUR GATEWAY CENTER
20TH FLOOR
PITTSBURGH, PA. 15222
[Signature] and *[Signature]* 4/28/08
APPROVED DATE

PORT AUTHORITY OF ALLEGHENY COUNTY
PITTSBURGH **PENNSYLVANIA**

NORTH SHORE CONNECTOR
NSC TRAIN SYSTEM (SYSTEM WIDE)
TWC LOOP LAYOUT
TYPICAL

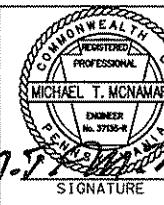


NOTES:

- PLAN IS NOT TO SCALE, FOR APPROXIMATE LAYOUT OF EQUIPMENT ONLY.
CONTRACTOR TO VERIFY ROOM DIMENSIONS AND EQUIPMENT DIMENSIONS
PRIOR TO INSTALLATION.
- CONTRACTOR SHALL FURNISH AND INSTALL OVERHEAD CABLE TRAYS AS
REQUIRED FOR THEIR EQUIPMENT.

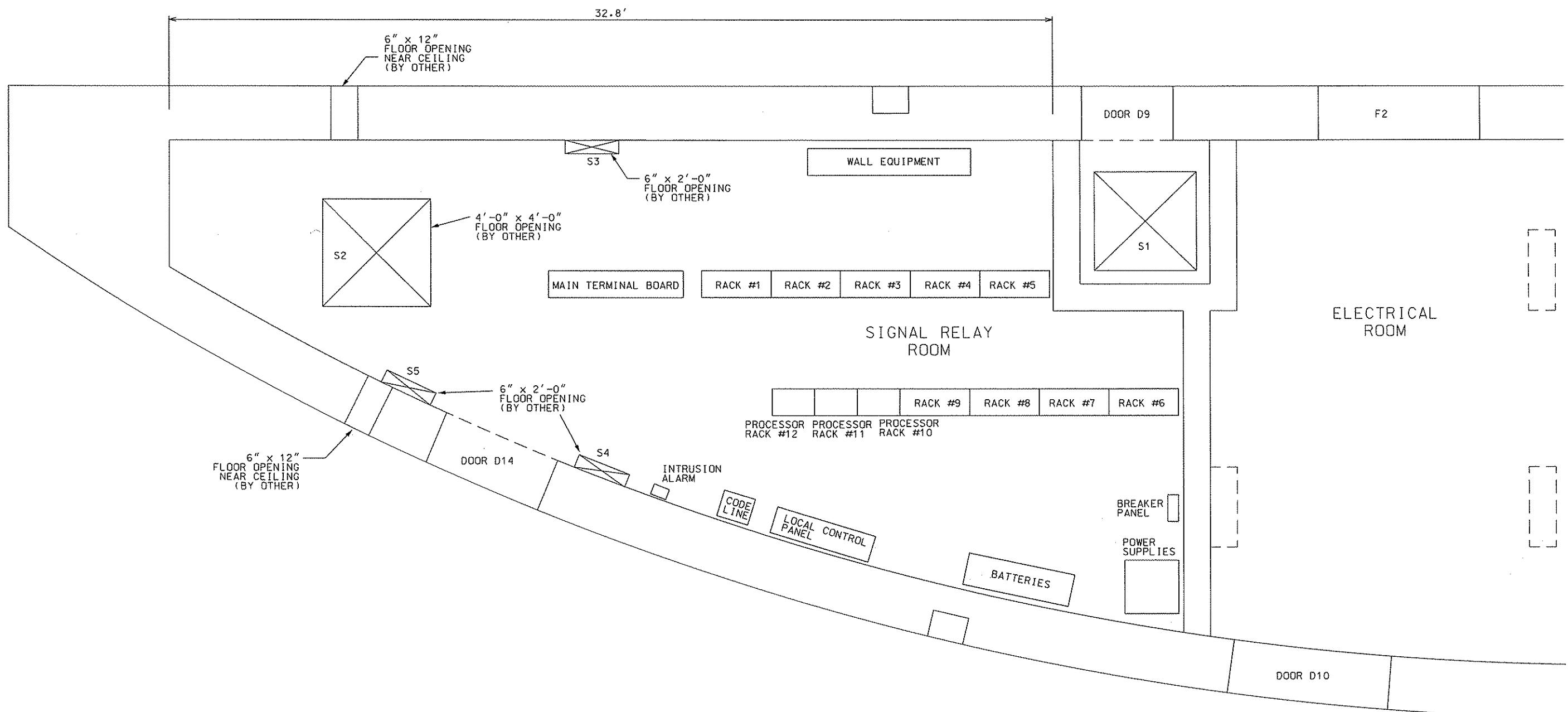
NO.	DATE	DESCRIPTION	
		REVISIONS	

THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.



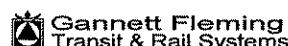
DMJM HARRIS | AECOM
FOUR GATEWAY CENTER
20TH FLOOR
PITTSBURGH, PA. 15222
CHECKED JF SAMEAN
IN CHARGE CD JONES
DATE APR. 28, 2008
SIGNATURE
APPROVED
DATE

PORT AUTHORITY OF ALLEGHENY COUNTY PITTSBURGH	
NORTH SHORE CONNECTOR NSC TRAIN SYSTEM (SYSTEM WIDE) SIGNAL RELAY ROOM LAYOUT GATEWAY STATION	
Port Authority	CONTRACT NO. NSC-009 DWG. NO. SG182 SHT. 4-21



NOTES:

1. PLAN IS NOT TO SCALE, FOR APPROXIMATE LAYOUT OF EQUIPMENT ONLY
CONTRACTOR TO VERIFY ROOM DIMENSIONS AND EQUIPMENT DIMENSIONS
PRIOR TO INSTALLATION.
 2. CONTRACTOR SHALL FURNISH AND INSTALL OVERHEAD CABLE TRAYS AS
REQUIRED FOR THEIR EQUIPMENT.



 Gannett Fleming Transit & Rail Systems		
NO.	DATE	DESCRIPTION
REVISIONS		

THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.



DMJM HARRIS AECON
FOUR GATEWAY CENTER
20TH FLOOR
PITTSBURGH, PA. 15222
Neen & Paul P. Hsing 4/28/01
APPROVED DATE

DESIGNED	JC TRAUM
DRAWN	JC TRAUM
CHECKED	JF SAMEAN
IN CHARGE	CD JONES
DATE	APR. 28, 2008
SCALE	NONE

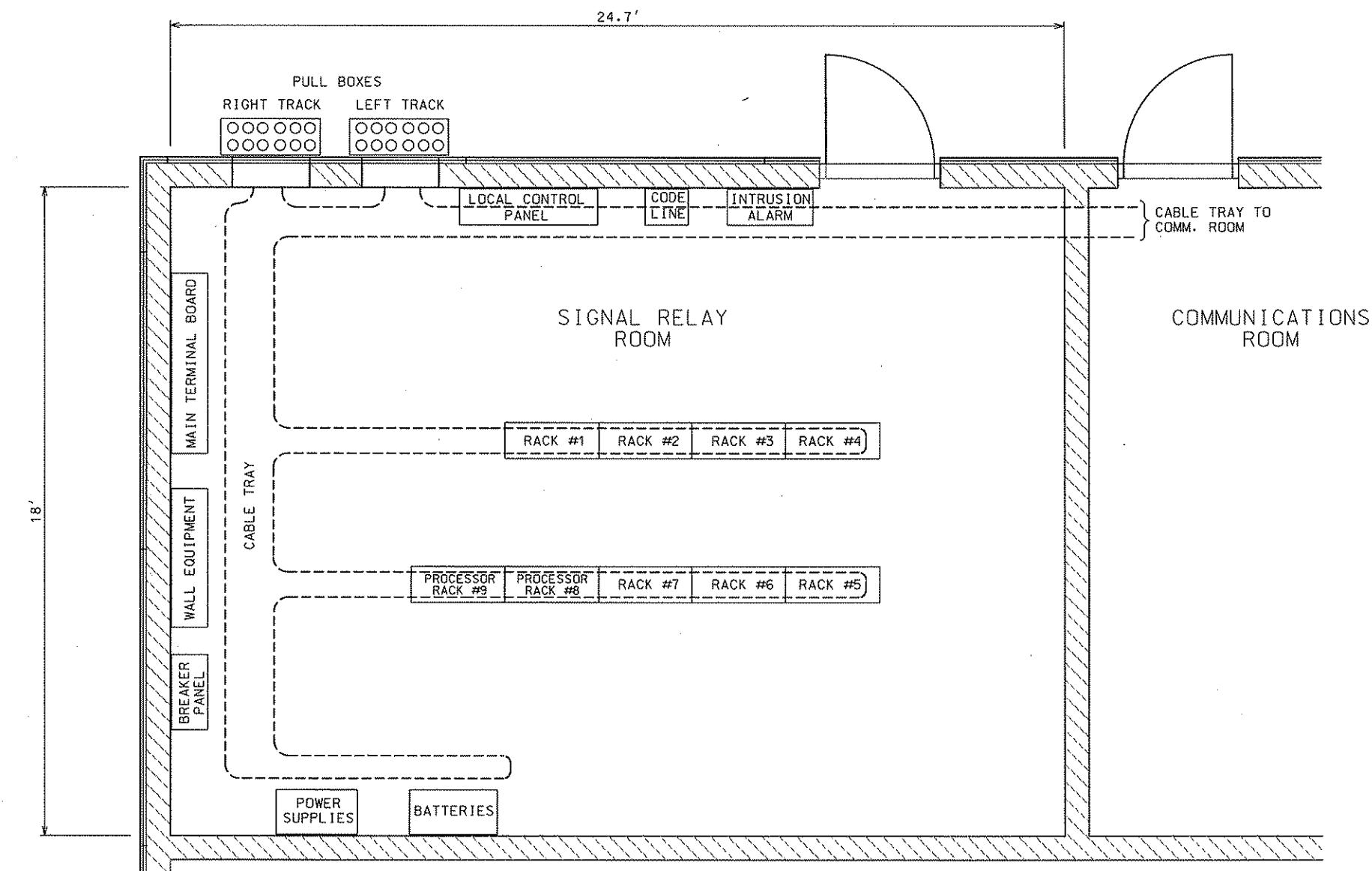
PITTSBURGH

PENNSYLVANIA

**NORTH SHORE CONNECTOR
NSC TRAIN SYSTEM (SYSTEM WIDE)
SIGNAL RELAY ROOM LAYOUT
NORTHSIDE STATION**

Port Authority

CONTRACT NO.	NSC-009
ITEM NO.	EC101



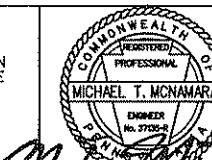
LEGEND:

----- CABLE TRAY

NOTES:

1. PLAN IS NOT TO SCALE, FOR APPROXIMATE LAYOUT OF EQUIPMENT ONLY.
CONTRACTOR TO VERIFY ROOM DIMENSIONS AND EQUIPMENT DIMENSIONS
PRIOR TO INSTALLATION.
2. CONTRACTOR SHALL FURNISH AND INSTALL OVERHEAD CABLE TRAYS AS
REQUIRED FOR THEIR EQUIPMENT.

THE PREPARATION OF THIS DOCUMENT HAS BEEN
FINANCED IN PART THROUGH A GRANT FROM THE
FEDERAL TRANSIT ADMINISTRATION, U.S.
DEPARTMENT OF TRANSPORTATION, UNDER THE
URBAN MASS TRANSPORTATION ACT OF 1964,
AS AMENDED, FOR THE PORT AUTHORITY OF
ALLEGHENY COUNTY, PENNSYLVANIA.



DMJM HARRIS | AECOM
FOUR GATEWAY CENTER
20TH FLOOR
PITTSBURGH, PA. 15222
IN CHARGE CD JONES
DATE APR. 28, 2008
SIGNATURE: M. T. McNamara, PE, 4/28/08
APPROVED: J. F. Samean
DATE: 4/28/08

DESIGNED H. LAY
DRAWN H. T. TRAN
CHECKED J. F. SAMEAN
IN CHARGE C. D. JONES
DATE APR. 28, 2008
SCALE NONE

PORT AUTHORITY OF ALLEGHENY COUNTY
Pittsburgh, Pennsylvania
NORTH SHORE CONNECTOR
NSC TRAIN SYSTEM (SYSTEM WIDE)
SIGNAL RELAY ROOM LAYOUT
ALLEGHENY STATION
Port Authority
Contract No. NSC-009
DWG. NO. SG166
Sht. 4-23

Gannett Fleming
Transit & Rail Systems

NO.	DATE	DESCRIPTION
REVISIONS		



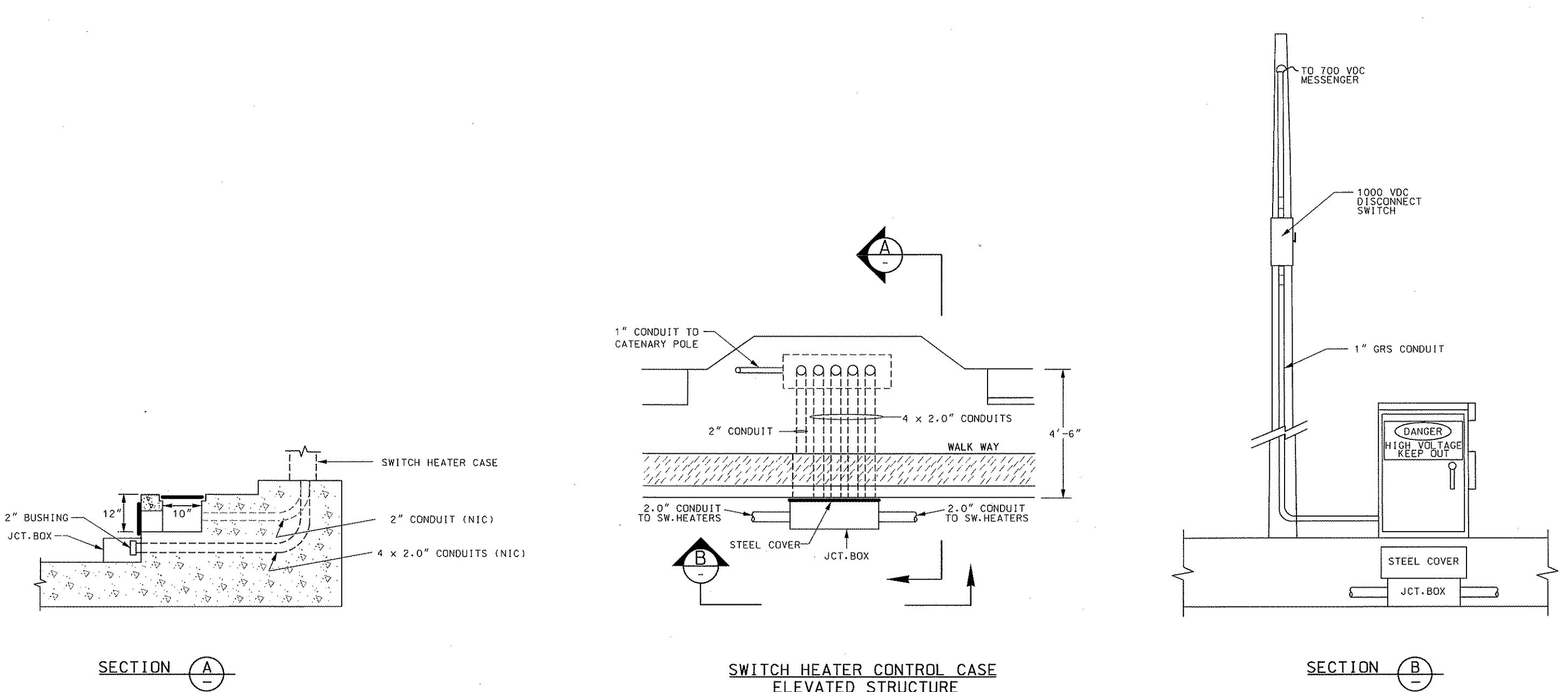
NO.	DATE	DESCRIPTION
REVISIONS		

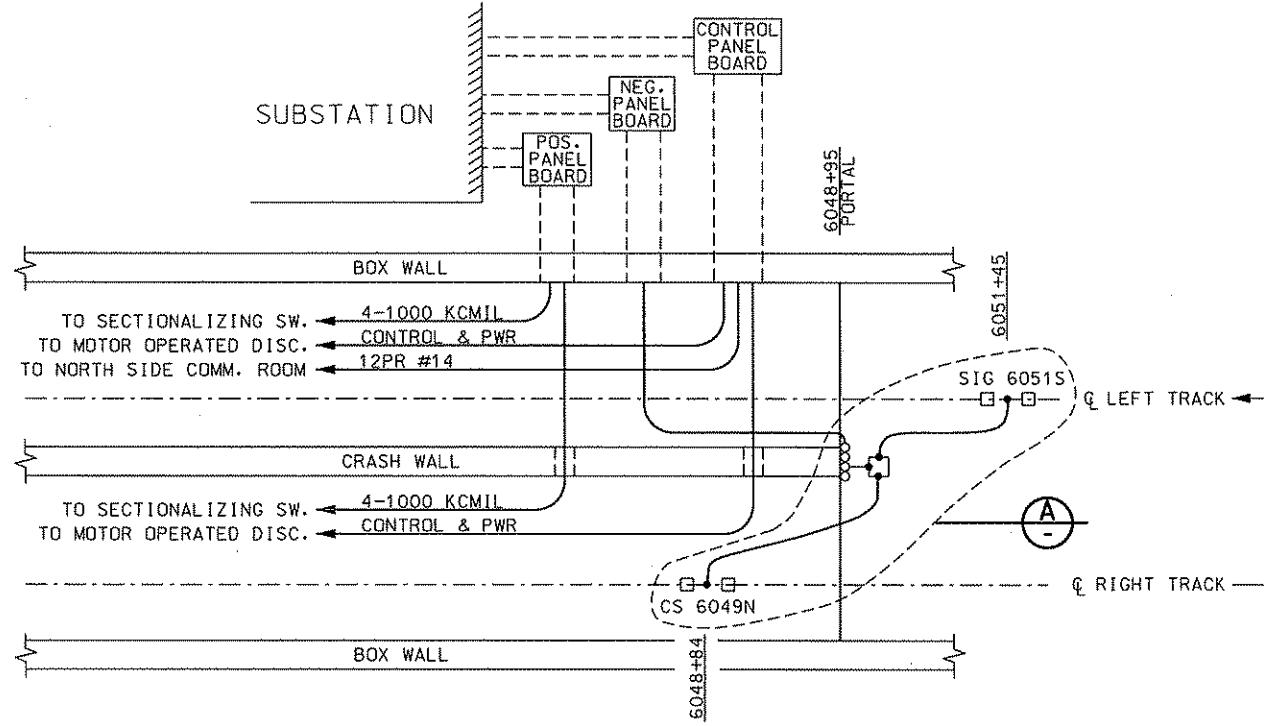
THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.



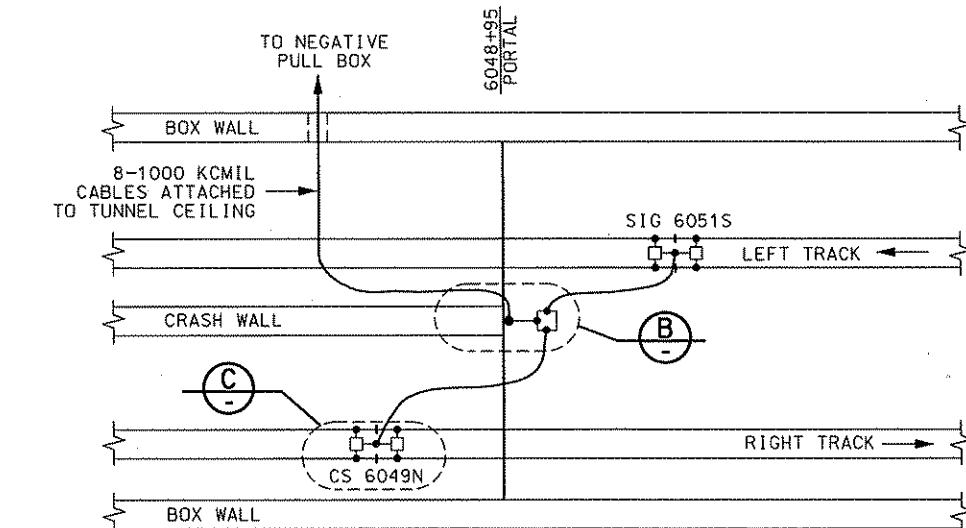
DMJM HARRIS | AECOM
FOUR GATEWAY CENTER
20TH FLOOR
PITTSBURGH, PA. 15222
MICHAEL T. McNAMARA
ENGINEER
REGISTRATION NO. 37002-2
APRIL 28, 2008
DRAFTED AND APPROVED
JF SAMEAN
CD JONES
DATE APR. 28, 2008
SCALE NTS
SIGNATURE
APPROVED DATE
4/26/08

PORT AUTHORITY OF ALLEGHENY COUNTY PITTSBURGH	
NORTH SHORE CONNECTOR NSC TRAIN SYSTEM (SYSTEM WIDE) TYPICAL SWITCH HEATER CASE INSTALLATION LAYOUT	
Port Authority	CONTRACT NO. NSC-009
	DWG. NO. SG190
	SH. A24

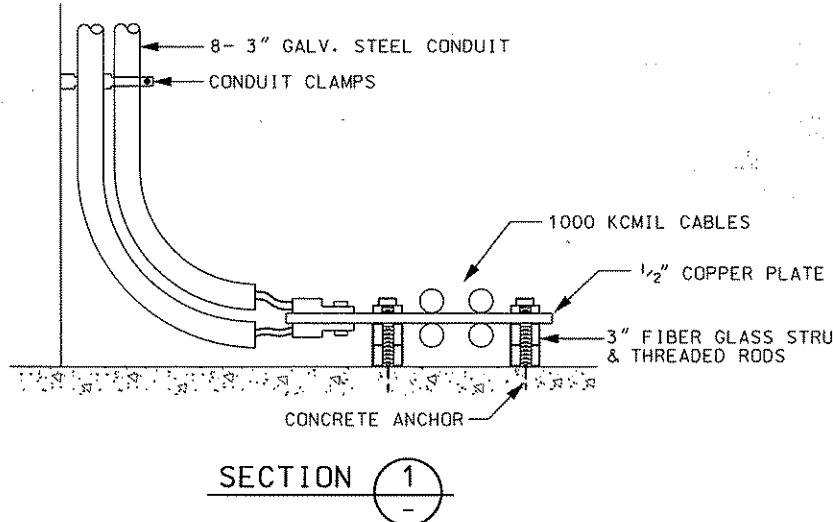




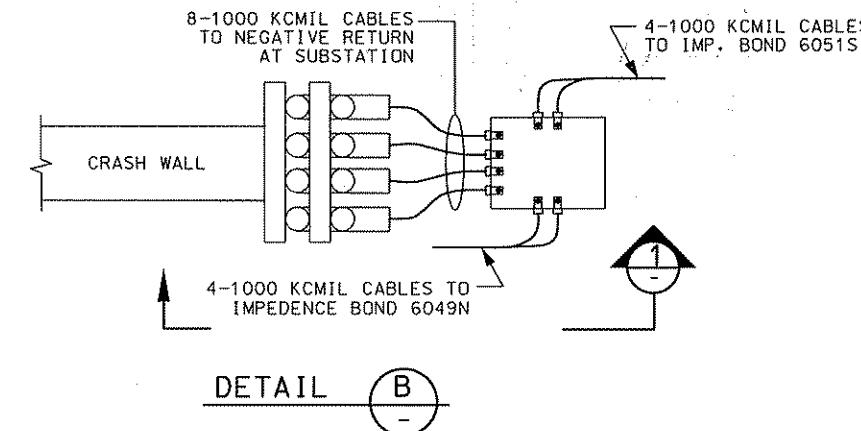
POSITIVE AND NEGATIVE CABLE LAYOUT



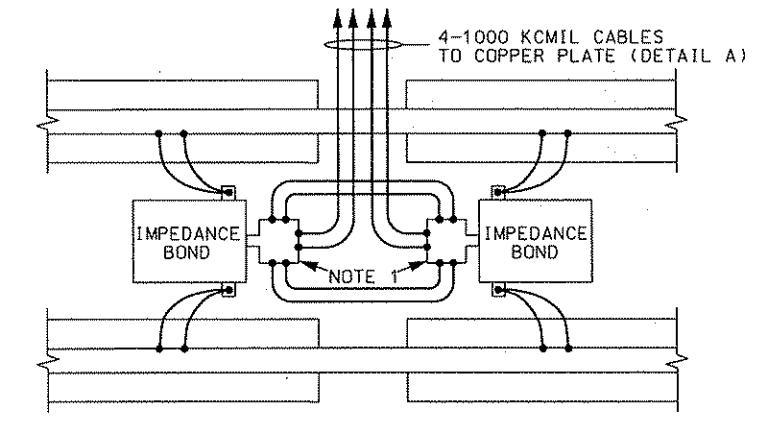
NEGATIVE RETURN - DETAIL A



SECTION 1



DETAIL B

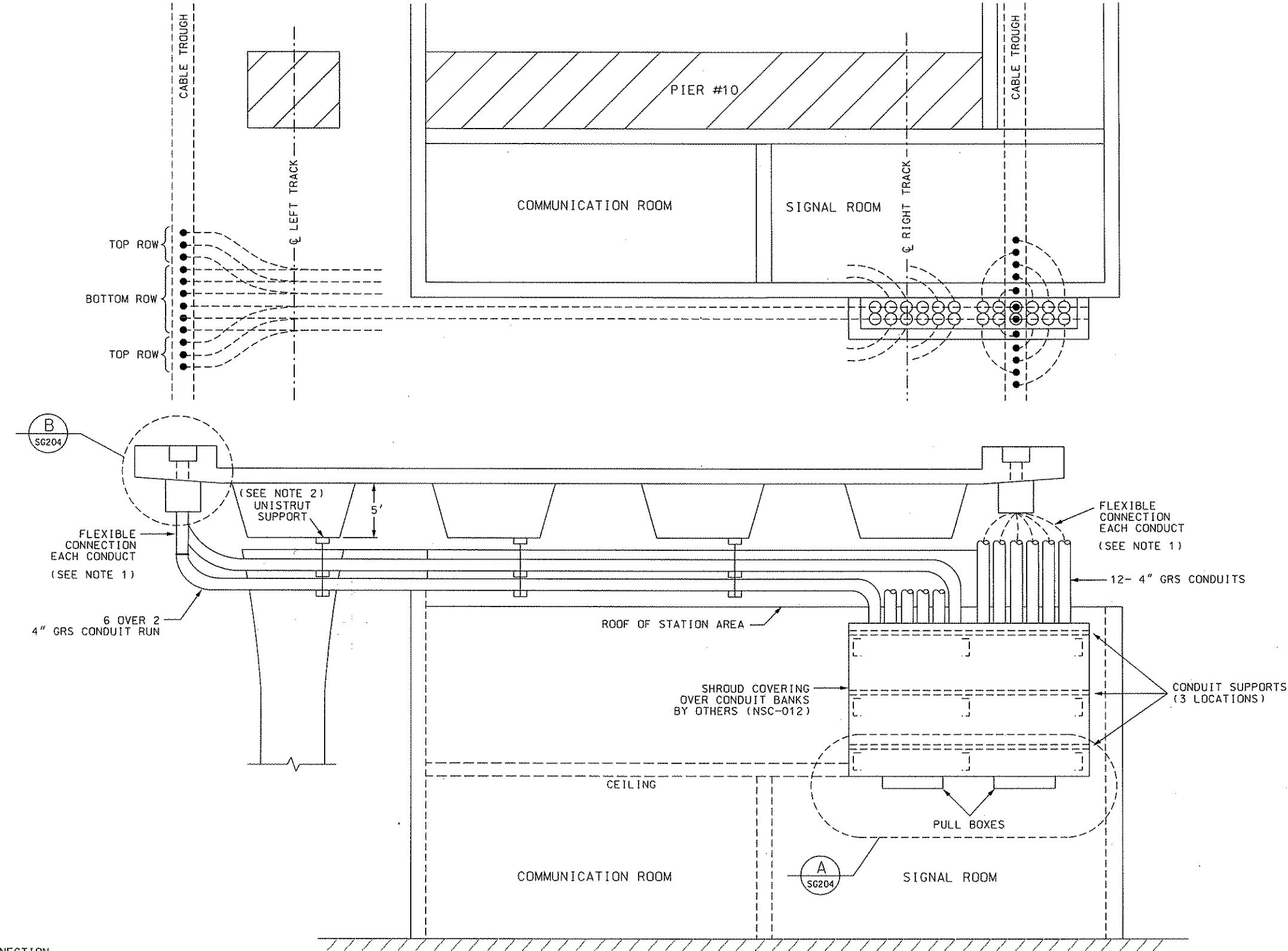


DETAIL C

NOTES:

1. 1/2" COPPER PLATE ATTACHED TO IMPEDANCE BOND CENTER LUG.
2. SEE DRAWING SC164 FOR IMPEDANCE BOND LAYOUT.
3. ALL CABLES TO BE EXOTHERMIC WELDED TO MOUNTING CONNECTIONS.
4. ALL CONNECTIONS TO COPPER PLATES TO BE CONNECTED WITH BRONZE BOLTS, NUTS & WASHERS.
5. SLEEVES PROVIDED THRU BOX WALL AND CRASH WALL BY OTHERS (NSC-006).

 Gannett Fleming Transit & Rail Systems			<small>THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.</small>	 MICHAEL T. MCNAMARA PROFESSIONAL Pittsburgh, PA DATE: APR. 28, 2008 SIGNATURE: <i>[Signature]</i> APPROVED: <i>[Signature]</i> DATE: <i>4/28/08</i>	DMJM HARRIS AECOM <small>FOUR GATEWAY CENTER 20TH FLOOR PITTSBURGH, PA. 15222</small>	<small>DESIGNED BY DRAWN BY H. LAY HT TRAN</small>	PORT AUTHORITY OF ALLEGHENY COUNTY <small>PITTSBURGH</small>	
							<small>NORTH SHORE CONNECTOR NSC TRAIN SYSTEM (SYSTEM WIDE) POSITIVE AND NEGATIVE CABLE LAYOUT TYPICAL</small>	
NO. DATE	DESCRIPTION	REVISIONS					Port Authority <small>Contract No. NSC-008 DWG. NO. SG200 Sheet 425</small>	

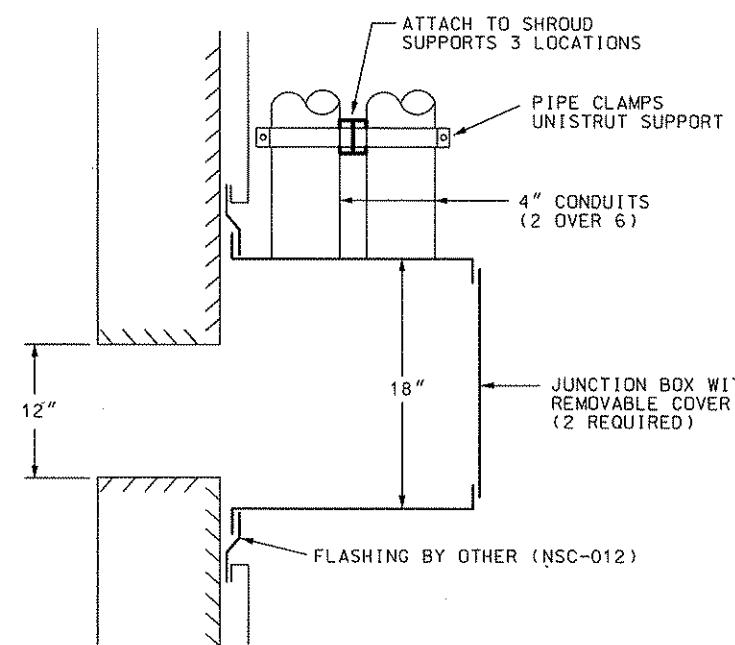


NOTES:

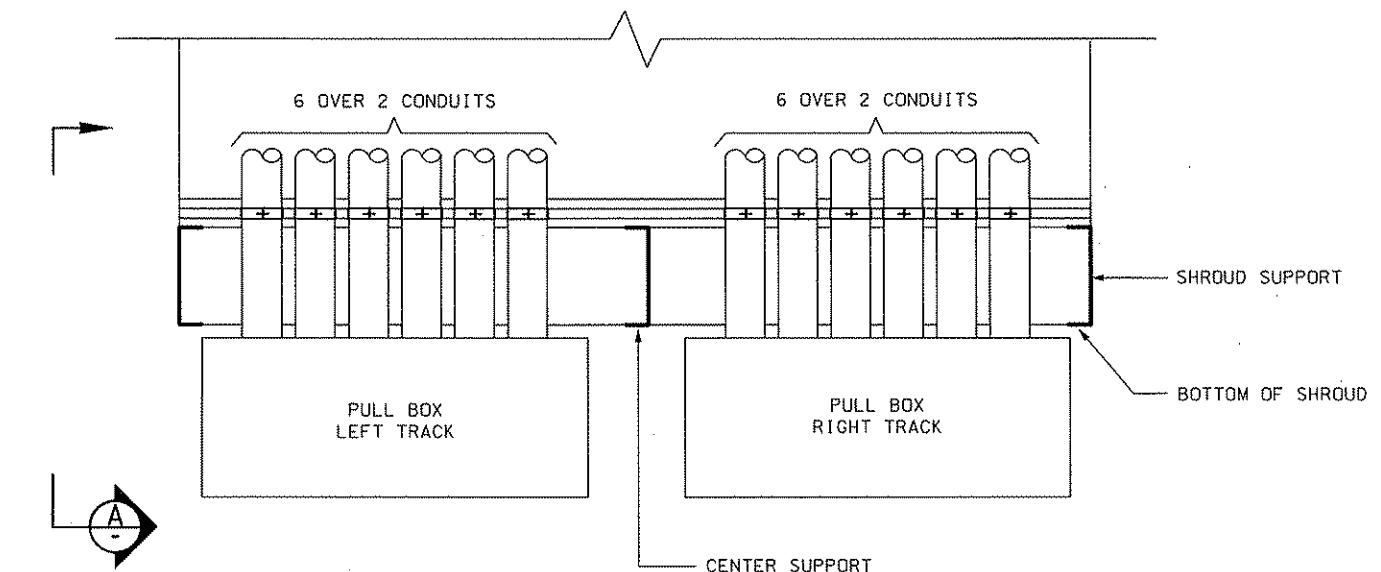
1. PROVIDE FLEXIBLE METAL CONNECTION TO ALLOW FOR 5" BRIDGE EXPANSION.
2. UNISTRUT SUPPORT ATTACHED TO BOX STRUCTURE BY OTHERS (NSC-007). REMAINDER OF SUPPORT ASSEMBLY FOR CONDUITS BY THIS CONTRACTOR.

ALLEGHENY CONDUIT LAYOUT

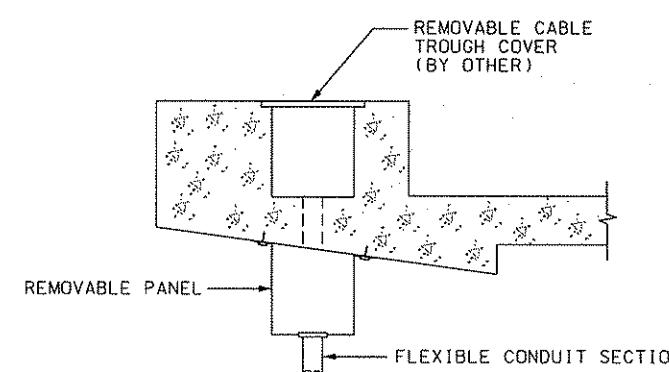
 Gannett Fleming Transit & Rail Systems			<p>THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.</p> <p>REVISIONS</p>	 COMMONWEALTH REGISTERED PROFESSIONAL MICHAEL T. McNAMARA DRAINED NO. 3700-E APRIL 28, 2008 SIGNATURE APPROVED DATE 4/28/08	DMJM HARRIS AECOM FOUR GATEWAY CENTER 20TH FLOOR PITTSBURGH, PA. 15222	DESIGNED H LAY DRAWN HT TRAN	PORT AUTHORITY OF ALLEGHENY COUNTY PITTSBURGH	
NO.	DATE	DESCRIPTION	CONTRACT NO. NSC-009	DWG. NO. SG203	SHT. 426			
		REVISIONS					NORTH SHORE CONNECTOR NSC TRAIN SYSTEM (SYSTEM WIDE) ALLEGHENY CONDUIT LAYOUT SHEET 1 OF 2	



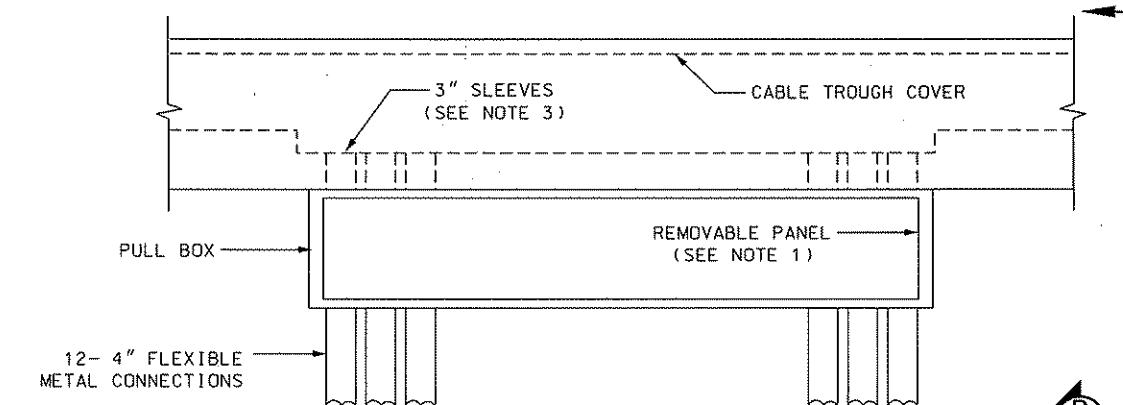
SECTION A



DETAIL A SG203



SECTION B



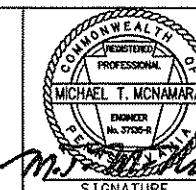
PULL BOX - DETAIL B SG203

LEFT TRACK SHOWN
RIGHT TRACK SIMILAR

NOTES:

1. PULL BOX TO BE PROVIDED WITH ACCESS PANEL TOWARDS OUTSIDE OF STRUCTURE.
2. ALL PULL BOXES TO BE PROVIDED WITH WEEP HOLES IN BOTTOM.
3. 3" SLEEVES IN CABLE TROUGH PROVIDED BY OTHERS (NSC-007) THESE ARE CENTERED AT 6083+83.61 ON RIGHT TRACK AND AT 6083+81.35 ON LEFT TRACK.

THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.

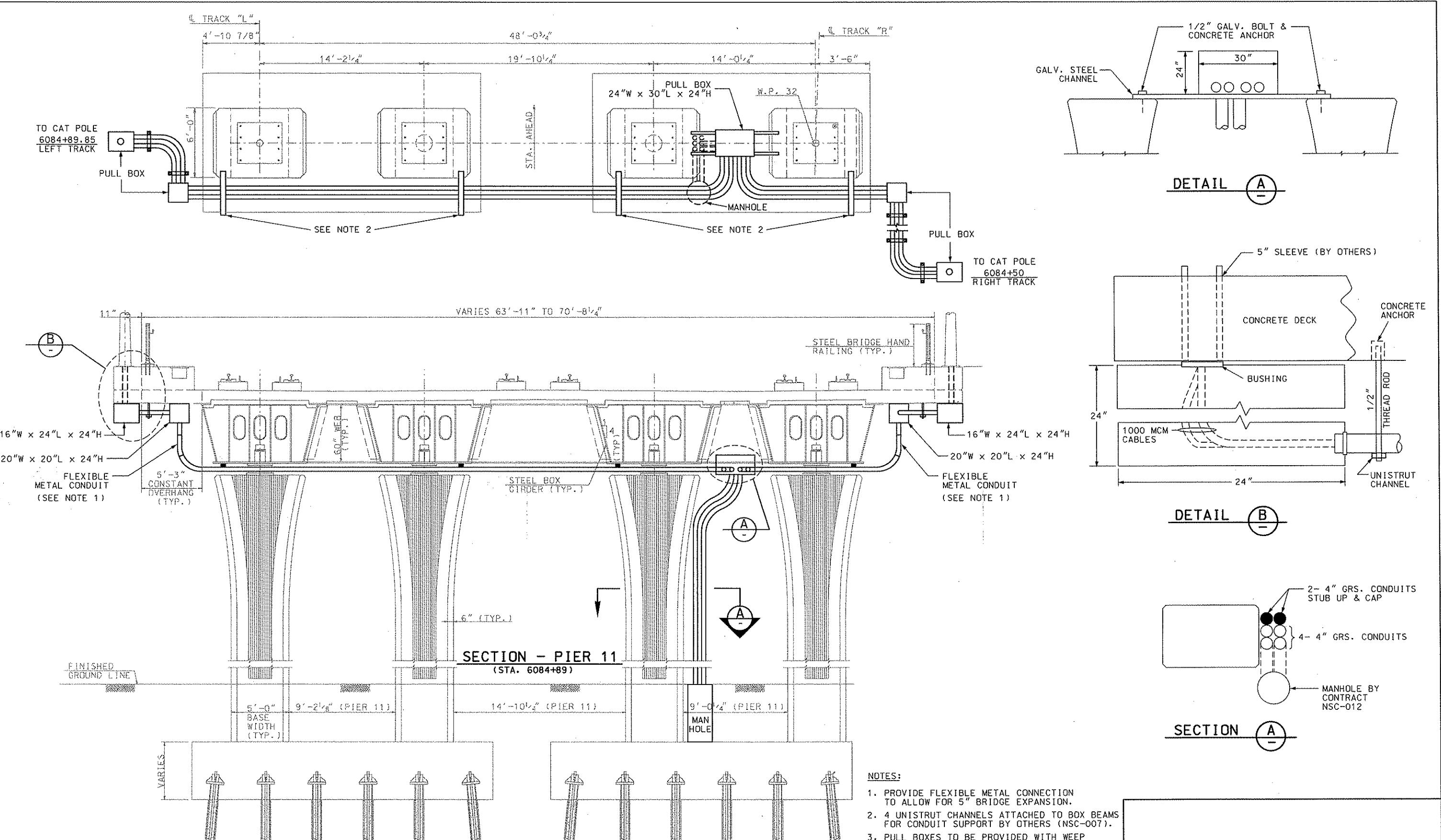


DMJM HARRIS | AECOM
FOUR GATEWAY CENTER
20TH FLOOR
PITTSBURGH, PA. 15222
CHECKED JF SAMEAN
IN CHARGE CD JONES
DATE APR. 28, 2008
SIGNATURE
APPROVED DATE
David P. Henry 4/28/08

PORT AUTHORITY OF ALLEGHENY COUNTY
PITTSTON, PENNSYLVANIA
NORTH SHORE CONNECTOR
NSC TRAIN SYSTEM (SYSTEM WIDE)
ALLEGHENY CONDUIT LAYOUT
SHEET 2 OF 2
Port Authority
CONTRACT NO. NSC-009
DWG. NO. SG204
SHT. 4-27

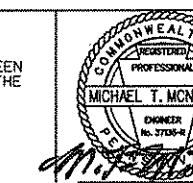
Gannett Fleming
Transit & Rail Systems

NO.	DATE	DESCRIPTION	REVISIONS



NOTE

1. PROVIDE FLEXIBLE METAL CONNECTION TO ALLOW FOR 5" BRIDGE EXPANSION.
 2. 4 UNISTRUT CHANNELS ATTACHED TO BOX BEAMS FOR CONDUIT SUPPORT BY OTHERS (NSC-007).
 3. PULL BOXES TO BE PROVIDED WITH WEEP HOLES IN BOTTOM.



DMJM HARRIS AECON
FOUR GATEWAY CENTER
20TH FLOOR
PITTSBURGH, PA. 15222
David & Henry 4/28/08

PITTSBURGH

PENNSYLVANIA

**NORTH SHORE CONNECTOR
NSC TRAIN SYSTEM (SYSTEM WIDE)
CATENARY FEED CONDUIT LAYOUT - PIER 11
STATION 6084+89.85**

Authority	CONTRACT NO.	NSC-009
	PROJ. NO.	SC205