



# PORt AUTHORITY OF ALLEGHENY COUNTY

## CONTRACT DRAWINGS

### NORTH SHORE CONNECTOR

NSC TRAIN SYSTEM (SYSTEM WIDE)

VOLUME 1

CONTRACT NO. NSC-009

IN THE CITY OF PITTSBURGH

FTA PROJECT NO. PA-03-0315

DATE - APRIL 28, 2008



Gannett Fleming  
Transit & Rail Systems



Dad P. Davis

5/13/08

Project Manager  
REG. PROF. ENGINEER PENNSYLVANIA

DMJM HARRIS | AECOM

FOUR GATEWAY CENTER  
20TH FLOOR  
PITTSBURGH, PA. 15222

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.

PORT AUTHORITY OF ALLEGHENY COUNTY  
APPROVED Winston M. Jumawoo DATE 05-13-2008  
Rail Operations /Engineering Officer

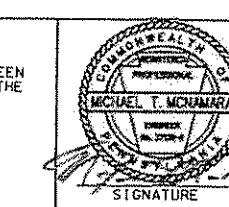
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SHEET NO.	DRAWING NO.	DRAWING TITLE	SHEET NO.	DRAWING NO.	DRAWING TITLE
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6	GN006	INDEX OF DRAWINGS (SIGNALS) SHEET 5 OF 9	53	TN105	STANDPIPE / SUMP / VENTILATION DEMOLITION PLAN 3 OF 3
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 Gannett Fleming  
Transit & Rail Systems

NO.	DATE	DESCRIPTION
REVISONS		



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

DESIGNED BY	J.C. TRAUM	PORT AUTHORITY OF ALLEGHENY COUNTY
DRAWN BY	J.C. TRAUM	PITTSBURGH, PENNSYLVANIA
CHECKED BY	T.A. SHANTZ	NORTH SHORE CONNECTOR
IN CHARGE	C.D. JONES	NSC TRAIN SYSTEM (SYSTEM-WIDE)
DATE	APR. 28, 2008	INDEX OF DRAWINGS (GENERAL/CIVIL)
SCALE	NTS	SHEET 1 OF 9
APPROVED	DATE	Port Authority
CONTRACT NO.	NSC-003	CONTRACT NO.
DWG. NO.	GN002	SHT. 2

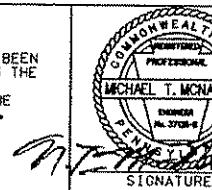
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SHEET NO.	DRAWING NO.	DRAWING TITLE	SHEET NO.	DRAWING NO.	DRAWING TITLE
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			150	TK310	TRACK PROFILE STA. 6036+00 TO STA. 6040+50 LEFT TRACK
			151	TK311	TRACK PROFILE STA. 6040+50 TO STA. 6046+00 LEFT TRACK
			152	TK312	TRACK PROFILE STA. 6046+00 TO STA. 6051+50 LEFT TRACK
			153	TK313	TRACK PROFILE STA. 6051+50 TO STA. 6074+00 LEFT TRACK
			154	TK314	TRACK PROFILE STA. 6074+00 TO STA. 6079+50 LEFT TRACK
			155	TK315	TRACK PROFILE STA. 6079+50 TO STA. 6084+00 LEFT TRACK
			156	TK316	TRACK PROFILE STA. 6084+00 TO STA. 6088+15.48 LEFT TRACK
			157	TK400	TRACK PROFILE STA. 6010+00 TO STA. 6012+00 RIGHT TRACK
			158	TK401	TRACK PROFILE STA. 6012+00 TO STA. 6015+00 RIGHT TRACK
			159	TK402	TRACK PROFILE STA. 6015+00 TO STA. 6019+50 RIGHT TRACK
			160	TK403	TRACK PROFILE STA. 6015+00 TO STA. 6019+50 RIGHT TRACK
			161	TK404	TRACK PROFILE STA. 6019+50 TO STA. 6025+00 RIGHT TRACK
			162	TK405	TRACK PROFILE STA. 6019+50 TO STA. 6025+00 RIGHT TRACK
			163	TK406	TRACK PROFILE STA. 6025+00 TO STA. 6030+50 RIGHT TRACK
			164	TK407	TRACK PROFILE STA. 6025+00 TO STA. 6030+50 RIGHT TRACK
			165	TK408	TRACK PROFILE STA. 6030+50 TO STA. 6036+00 RIGHT TRACK
			166	TK409	TRACK PROFILE STA. 6030+50 TO STA. 6036+00 RIGHT TRACK
			167	TK410	TRACK PROFILE STA. 6036+00 TO STA. 6040+50 RIGHT TRACK
			168	TK411	TRACK PROFILE STA. 6040+50 TO STA. 6046+00 RIGHT TRACK
			169	TK412	TRACK PROFILE STA. 6046+00 TO STA. 6051+00 RIGHT TRACK
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			172	TK415	TRACK PROFILE STA. 6079+00 TO STA. 6083+50 RIGHT TRACK
			173	TK416	TRACK PROFILE STA. 6083+50 TO STA. 6088+06.37 RIGHT TRACK

 Gannett Fleming  
Transit & Rail Systems

NO.	DATE	DESCRIPTION
REVISIONS		

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DMJM HARRIS | AECOM  
FOUR GATEWAY CENTER  
20TH FLOOR  
PITTSBURGH, PA. 15222  
*[Signature]*  
APPROVED DATE  
Michael T. McNamara  
APRIL 28, 2008

DESIGNED JC TRAUM  
DRAWN JC TRAUM  
CHECKED -  
IN CHARGE CD JONES  
DATE APR. 28. 2008  
SCALE NTS  
APPROVED DATE  
Michael T. McNamara  
APRIL 28, 2008

Port Authority  
Contract No. NSC-069  
Drawing No. GN003  
Sheet No. 3

PORT AUTHORITY OF ALLEGHENY COUNTY  
PITTSBURGH, PENNSYLVANIA  
NORTH SHORE CONNECTOR  
NSC TRAIN SYSTEM (SYSTEM-WIDE)  
INDEX OF DRAWINGS (TRACK)  
SHEET 2 OF 8

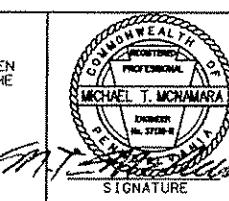
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Transit & Rail Systems

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20TH FLOOR  
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SIGNED  
APPROVED  
DATE  
Signature: *David P. Hargis 4/28/08*

DESIGNED JC TRAUM  
DRAWN JC TRAUM  
CHECKED TA SHANTZ  
IN CHARGE CD JONES  
DATE APR. 28, 2008  
SCALE NTS

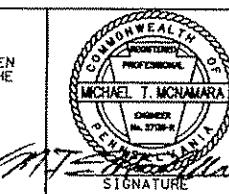
**PORT AUTHORITY OF ALLEGHENY COUNTY**  
PITTSBURGH  
Pennsylvania  
NORTH SHORE CONNECTOR  
NSC TRAIN SYSTEM (SYSTEM-WIDE)  
INDEX OF DRAWINGS (OCS)  
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Contract No. NSC-009  
Dwg. No. GN004  
Sht. 4

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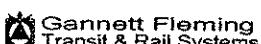
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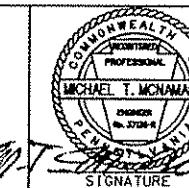
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INDEX OF DRAWINGS (TRACTION POWER /SUBSTATION)  
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DESIGNED DRAWN	JC TRAUM JC TRAUM	PORT AUTHORITY OF ALLEGHENY COUNTY PITTSBURGH PENNSYLVANIA	
CHECKED IN CHARGE DATE	TA SHANTZ CD JONES APR. 28. 2008	NORTH SHORE CONNECTOR NSC TRAIN SYSTEM (SYSTEM-WIDE) INDEX OF DRAWINGS (SIGNALS) SHEET 5 OF 9	
SCALE	NTS	Port Authority	CONTRACT NO. NSC-009

## INDEX OF DRAWINGS

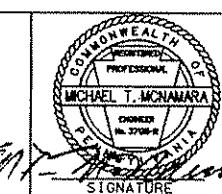
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Daniel F. Hwang 4/28/08  
APPROVED DATE

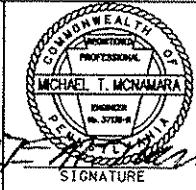
**PORT AUTHORITY OF ALLEGHENY COUNTY**  
 PITTSBURGH, PENNSYLVANIA

NORTH SHORE CONNECTOR  
 NSC TRAIN SYSTEM (SYSTEM-WIDE)

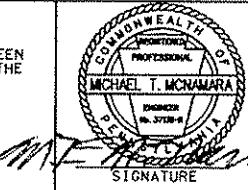
INDEX OF DRAWINGS (SIGNALS - EXISTING WOOD STREET MODIFICATIONS)  
 SHEET 6 OF 9

# INDEX OF DRAWINGS

SHEET NO.	DRAWING NO.	DRAWING TITLE	SHEET NO.	DRAWING NO.	DRAWING TITLE
<u>COMMUNICATIONS</u>					
522	CM003	COMMUNICATION SYSTEM LAYOUT	560	CM101	OPERATIONS CONTROL CENTER SYSTEM UPGRADE CONTEXT DIAGRAM
523	CM004	FIBER RING OPTICAL CABLE LOSSES	561	CM102	OPERATIONS CONTROL CENTER SYSTEM TO CTS INTERCONNECTIVITY DIAGRAM
524	CM005	NSC SONET RING	562	CM104	OPERATIONS CONTROL CENTER OVERVIEW DISPLAY LAYOUT
525	CM006	FIBER OPTIC RING FOR THE DIGITAL VIDEO SYSTEM			
526	CM007	NSC GENERAL CABLE PLAN			
527	CM011	GATEWAY CENTER CTS BLOCK DIAGRAM			
528	CM012	NORTH SIDE STATION CTS BLOCK DIAGRAM			
529	CM013	ALLEGHENY STATION CTS BLOCK DIAGRAM			
530	CM020	POWER SUPPLY BLOCK DIAGRAM			
531	CM023	TYPICAL VMS / PA SYSTEM STATION BLOCK DIAGRAM			
532	CM025	PITT TOWER CONTROL ROOM VIDEO DISPLAY ARRANGEMENTS			
533	CM026	PITT TOWER DIGITAL VIDEO SYSTEM			
534	CM027	PITT TOWER DIGITAL VIDEO SYSTEM			
535	CM028	TYPICAL STATION DIGITAL VIDEO SYSTEM			
536	CM029	BORED TUNNEL PORTAL SURVEILLANCE DETECTION SYSTEM			
537	CM030	PORTAL SURVEILLANCE DETECTION SYSTEM MOUTING DETAILS			
538	CM031	PITT TOWER VIDEO SYSTEM EQUIPMENT ROOM			
539	CM032	PITT TOWER POWER DISTRIBUTION & GROUNDING ARRANGEMENTS			
540	CM037	TELEPHONE SYSTEM BLOCK DIAGRAM			
541	CM038	TYPICAL EMERGENCY PHONE - ELEVATED STRUCTURE			
542	CM039	TYPICAL EMERGENCY PHONE LAYOUT AT 6051+80			
543	CM040	TYPICAL EMERGENCY PHONE LAYOUT			
544	CM041	TYPICAL EMERGENCY PHONE - TUNNEL			
545	CM042	TYPICAL INTERFACE TO EXISTING CODE SYSTEM			
546	CM043	TYPICAL SCADA SYSTEM BLOCK DIAGRAM			
547	CM044	VOICE SYSTEM BLOCK DIAGRAM			
548	CM045	TYPICAL INTRUSION ALARM SYSTEM			
549	CM050	RADIO SYSTEM BLOCK DIAGRAM			
550	CM051	OPERATIONS CONTROL CENTER / TWO-WAY RADIO SYSTEM FUNCTIONAL LAYOUT			
551	CM052	TWO-WAY RADIO SYSTEM FUNCTIONAL LAYOUT			
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553	CM061	NORTH SIDE STATION - RADIO BLOCK DIAGRAM			
554	CM062	ALLEGHENY STATION - RADIO BLOCK DIAGRAM			
555	CM070	GATEWAY STATION - COMMUNICATION EQUIPMENT ROOM LAYOUT			
556	CM071	NORTH SIDE STATION - COMMUNICATION EQUIPMENT ROOM LAYOUT			
557	CM072	ALLEGHENY STATION - COMMUNICATION EQUIPMENT ROOM LAYOUT			
558	CM073	TYPICAL COMMUNICATION ROOM EQUIPMENT RACK LAYOUT			
559	CM074	ALLEGHENY STATION COMMUNICATION ROOM RADIO RACK LAYOUT			
559A	CM075	GATEWAY STATION - COMMUNICATION DEVICE TO/FROM CABLE LIST			
559B	CM076	NORTH SIDE STATION - COMMUNICATION DEVICE TO/FROM CABLE LIST			
559C	CM077	ALLEGHENY STATION - COMMUNICATION DEVICE TO/FROM CABLE LIST			

					<b>DMJM HARRIS</b>   AECOM FOUR GATEWAY CENTER 20TH FLOOR PITTSBURGH, PA. 15222 <small>SIGNATURE</small> <i>[Signature]</i>	<small>DESIGNED JC TRAUM DRAWN HT TRAN CHECKED R WEIDER IN CHARGE CD JONES DATE APR. 28, 2008 SCALE NTS</small>	<b>PORT AUTHORITY OF ALLEGHENY COUNTY</b> <small>PITTSBURGH PENNSYLVANIA</small>  <b>NORTH SHORE CONNECTOR</b> <small>NSC TRAIN SYSTEM (SYSTEM-WIDE)</small> <b>INDEX OF DRAWINGS (COMMUNICATIONS)</b> <small>SHEET 7 OF 9</small>	
	NO.	DATE	DESCRIPTION					

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  
*[Signature]*  
SIGNATURE  
*[Signature]*  
APPROVED DATE

Port Authority  
Engineering Services  
 CONTRACT NO. NSC-009  
 DWG. NO. GN008 SHT. 8

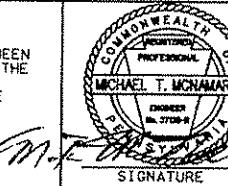
# INDEX OF DRAWINGS

SHEET NO.	DRAWING NO.	DRAWING TITLE	SHEET NO.	DRAWING NO.	DRAWING TITLE
<u>CABLE ROUTING</u>					<u>WOOD STREET STAGING</u>
563	CR100	ELECTRICAL CABLE ROUTING PLAN GATEWAY STATION	606	WS001	WOOD STREET RECOMMENDED STAGING PLAN (1 OF 2)
564	CR101	ELECTRICAL CABLE ROUTING PLAN GATEWAY STATION TO TUNNEL	607	WS002	WOOD STREET RECOMMENDED STAGING PLAN (2 OF 2)
565	CR102	ELECTRICAL CABLE ROUTING PLAN TUNNEL SECTION			
566	CR103	ELECTRICAL CABLE ROUTING PLAN TUNNEL SECTION			
567	CR104	ELECTRICAL CABLE ROUTING PLAN NORTH SIDE STATION			
568	CR105	ELECTRICAL CABLE ROUTING PLAN NORTH SIDE TO ALLEGHENY STATION			
569	CR200	SIGNAL CABLE ROUTING PLAN GATEWAY STATION			
570	CR201	SIGNAL EXPRESS CABLE ROUTING PLAN GATEWAY STATION TO TUNNEL			
571	CR202	SIGNAL CABLE ROUTING PLAN TUNNEL SECTION			
572	CR203	SIGNAL CABLE ROUTING PLAN TUNNEL SECTION			
573	CR204	SIGNAL CABLE ROUTING PLAN NORTH SIDE STATION			
574	CR205	SIGNAL CABLE ROUTING PLAN NORTH SIDE TO ALLEGHENY STATION			
575	CR206	SIGNAL CABLE ROUTING PLAN NORTH SIDE TO ALLEGHENY STATION			
576	CR207	SIGNAL CABLE ROUTING PLAN NORTH SIDE TO ALLEGHENY STATION			
577	CR208	SIGNAL CABLE ROUTING PLAN ALLEGHENY STATION			
578	CR300	COMMUNICATION CABLE ROUTING PLAN GATEWAY STATION TO TUNNEL			
579	CR301	COMMUNICATION CABLE ROUTING PLAN TUNNEL SECTION			
580	CR302	COMMUNICATION CABLE ROUTING PLAN TUNNEL SECTION			
581	CR303	COMMUNICATION CABLE ROUTING PLAN NORTH SIDE STATION			
582	CR304	COMMUNICATION CABLE ROUTING PLAN NORTH SIDE TO ALLEGHENY STATION			
583	CR305	COMMUNICATION CABLE ROUTING PLAN NORTH SIDE TO ALLEGHENY STATION			
584	CR306	COMMUNICATION CABLE ROUTING PLAN NORTH SIDE TO ALLEGHENY STATION			
585	CR307	COMMUNICATION CABLE ROUTING PLAN ALLEGHENY STATION			
586	CR400	LEAKY CO-AXIAL CABLE ROUTING PLAN GATEWAY STATION TO TUNNEL			
587	CR401	LEAKY CO-AXIAL CABLE ROUTING PLAN GATEWAY STATION ROOM LAYOUT			
588	CR402	LEAKY CO-AXIAL CABLE ROUTING PLAN TUNNEL SECTION			
589	CR403	LEAKY CO-AXIAL CABLE ROUTING PLAN TUNNEL SECTION			
590	CR404	LEAKY CO-AXIAL CABLE ROUTING PLAN NORTH SIDE STATION			
591	CR405	LEAKY CO-AXIAL CABLE ROUTING PLAN NORTH SIDE STATION - CONCOURSE LEVEL - EAST SIDE			
592	CR406	LEAKY CO-AXIAL CABLE ROUTING PLAN CONCOURSE LEVEL - WEST SIDE			
593	CR407	LEAKY CO-AXIAL CABLE ROUTING PLAN CEILING MOUNTING ANTENNA			
594	CR408	LEAKY CO-AXIAL CABLE ROUTING PLAN NORTH SIDE TO ALLEGHENY STATION			
595	CR409	LEAKY CO-AXIAL CABLE ROUTING PLAN ALLEGHENY STATION			
596	CR410	LEAKY CO-AXIAL CABLE ROUTING PLAN ALLEGHENY STATION			
597	CR500	TUNNEL SURVEILLANCE SYSTEM GATEWAY STATION TO TUNNEL			
598	CR501	TUNNEL SURVEILLANCE SYSTEM TUNNEL SECTION			
599	CR502	TUNNEL SURVEILLANCE SYSTEM TUNNEL SECTION			
600	CR503	TUNNEL SURVEILLANCE SYSTEM NORTH SIDE STATION			
601	CR504	TUNNEL SURVEILLANCE SYSTEM NORTH SIDE STATION TO ALLEGHENY STATION			
602	CR700	NORTH SIDE STATION - CABLE ROUTING SECTION A			
603	CR701	NORTH SIDE STATION - CABLE ROUTING SECTION B			
604	CR702	NORTH SIDE STATION - CABLE ROUTING SECTION C			
605	CR703	NORTH SIDE STATION - CABLE ROUTING SECTION D			

Gannett Fleming  
Transit & Rail Systems

NO.	DATE	DESCRIPTION
REVISIONS		

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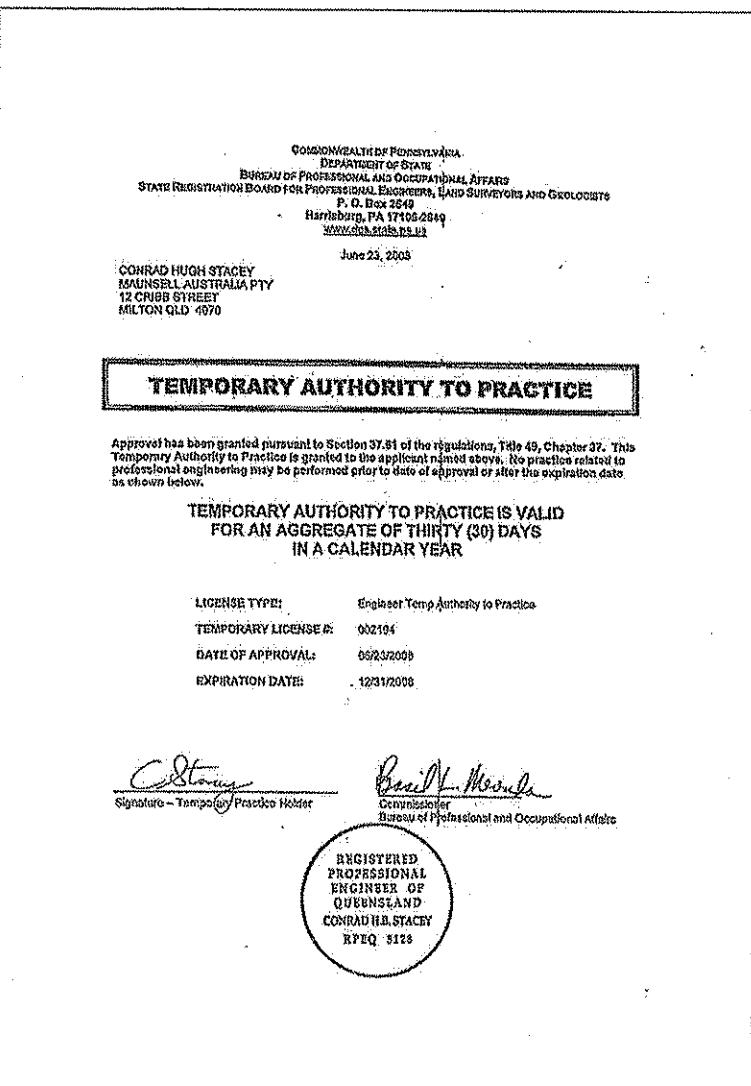


DMJM HARRIS | AECOM  
FOUR GATEWAY CENTER  
20TH FLOOR  
PITTSBURGH, PA. 15222  
DESIGNED JC TRAUM  
DRAWN JC TRAUM  
CHECKED JF SAMEAN  
IN CHARGE CD JONES  
DATE APR. 28, 2008  
SCALE NTS  
APPROVED David P. Harrington 4/28/08  
SIGNATURE DATE

Port Authority  
Contract No. NSC-009  
DWG. NO. CN009 SHT. 9  
PORT AUTHORITY OF ALLEGHENY COUNTY  
Pittsburgh, Pennsylvania  
NORTH SHORE CONNECTOR  
NSC TRAIN SYSTEM (SYSTEM-WIDE)  
INDEX OF DRAWINGS (CABLE ROUTING / WOOD STREET STAGING)  
SHEET 8 OF 9

# INDEX OF DRAWINGS

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608	FP-100	GATEWAY LINE - TUNNEL FIRE HYDRANT LAYOUT PLAN
609	FP-101	GATEWAY LINE - TUNNEL FIRE HYDRANT PLAN, SHEET 1 OF 2
610	FP-102	GATEWAY LINE - TUNNEL FIRE HYDRANT PLAN, SHEET 2 OF 2
611	FP-103	GATEWAY LINE - TUNNEL FIRE HYDRANT LONG SECTIONS, SHEET 1 OF 3
612	FP-104	GATEWAY LINE - TUNNEL FIRE HYDRANT LONG SECTIONS, SHEET 2 OF 3
613	FP-105	GATEWAY LINE - TUNNEL FIRE HYDRANT LONG SECTIONS, SHEET 3 OF 3
614	FP-106	GATEWAY LINE - TUNNEL FIRE HYDRANT AND EXTINGUISHER TYPICAL DETAILS, SHEET 1 OF 2
615	FP-107	GATEWAY LINE - TUNNEL FIRE HYDRANT TYPICAL DETAILS, SHEET 2 OF 2
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617	MC-100	GATEWAY LINE - BORED TUNNEL SUMP PUMP PLAN
618	MC-101	GATEWAY LINE - TUNNEL SUMP PUMP PLAN & PIPING ROUTE
619	MC-102	GATEWAY LINE - NORTH SIDE STATION TO PORTAL SUMP PUMP - PLAN
620	MC-103	GATEWAY LINE - GATEWAY STATION SUMP PUMP - PLAN
621	MC-104	GATEWAY LINE - VENTILATION SCHEMATIC
622	MC-105	GATEWAY LINE - JET FAN SECTIONS - EXISTING TUNNEL TO WOOD ST. STATION
623	MC-106	GATEWAY STATION - STATION TV FLOW SCHEMATIC
624	MC-107	GATEWAY STATION - TV EXHAUST PLAN
625	MC-108	GATEWAY STATION - MECHANICAL EQUIPMENT
626	MC-111	GATEWAY STATION - TV FAN ROOM PLAN
627	MC-112	GATEWAY STATION - TV FAN ROOM ELEVATIONS
628	MC-113	GATEWAY STATION - NOZZLE PLAN & ELEVATIONS
629	MC-114	GATEWAY STATION - NORTHERN TUNNEL DAMPERS
630	MC-115	GATEWAY STATION - UNDER PLATFORM DAMPERS
631	MC-200	NORTH SIDE STATION - STATION TV FLOW SCHEMATIC
632	MC-201	NORTH SIDE STATION - MECHANICAL EQUIPMENT - SHEET 1 OF 2 (EAST)
633	MC-202	NORTH SIDE STATION - MECHANICAL EQUIPMENT - SHEET 2 OF 2 (WEST)
634	MC-210	NORTH SIDE STATION - TV EXHAUST DUCT PLAN
635	MC-220	NORTH SIDE STATION - EASTERN END, TV FAN ROOM PLAN
636	MC-221	NORTH SIDE STATION - EASTERN END, TV FAN ROOM ELEVATIONS
637	MC-230	NORTH SIDE STATION - WESTERN END, TV FAN ROOM PLAN
638	MC-231	NORTH SIDE STATION - WESTERN END, TV FAN ROOM ELEVATIONS
639	MC-232	NORTH SIDE STATION - JET FAN SECTIONS - CUT AND COVER TUNNEL - SHEET 1 OF 2
640	MC-233	NORTH SIDE STATION - JET FAN SECTIONS - CUT AND COVER TUNNEL - SHEET 2 OF 2
641	MC-300	GATEWAY LINE - TYPICAL DAMPER MOUNTING DETAILS
642	MC-301	GATEWAY STATION - TYPICAL PLATFORM LENGTH BALANCING DAMPERS - SHEET 1 OF 2
643	MC-302	NORTH SIDE STATION - TYPICAL PLATFORM LENGTH BALANCING DAMPERS - SHEET 2 OF 2
644	MC-400	TUNNEL VENTILATION SYSTEM - VENTILATION ZONES - SHEET 1 OF 2
645	MC-401	TUNNEL VENTILATION SYSTEM - VENTILATION ZONES - SHEET 2 OF 2
646	MC-402	TUNNEL VENTILATION SYSTEM - MODE TABLE - SHEET 1 OF 3
647	MC-403	TUNNEL VENTILATION SYSTEM - MODE TABLE - SHEET 2 OF 3
648	MC-404	TUNNEL VENTILATION SYSTEM - MODE TABLE - SHEET 3 OF 3
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649	EL-002	TUNNEL LIGHTING - TYPICAL DETAILS
650	EL-003	TUNNEL LIGHTING - TYPICAL DETAILS
651	EL-020	GATEWAY STATION - CONTROL SYSTEM BLOCK DIAGRAM
652	EL-022	TUNNEL VENTILATION - TYPICAL NON-MODULATING DAMPER CONTROL SCHEMATICS SHEET 1 OF 2
653	EL-023	TUNNEL VENTILATION - TYPICAL NON-MODULATING DAMPER CONTROL SCHEMATICS SHEET 2 OF 2
654	EL-024	TUNNEL VENTILATION - TYPICAL NON-MODULATING DAMPER CONTROL CONNECTION DIAGRAM
655	EL-025	TUNNEL VENTILATION - TYPICAL MODULATING DAMPER CONTROL SCHEMATICS SHEET 1 OF 2
656	EL-026	TUNNEL VENTILATION - TYPICAL MODULATING DAMPER CONTROL SCHEMATICS SHEET 2 OF 2
657	EL-027	TUNNEL VENTILATION - TYPICAL MODULATING DAMPER CONTROL CONNECTION DIAGRAM
658	EL-101	GATEWAY STATION - OVERALL POWER SLD CONTRIBUTION
659	EL-106	GATEWAY STATION - LV DISTRIBUTION CONTRIBUTION SHEET 1 OF 2
660	EL-107	GATEWAY STATION - LV DISTRIBUTION CONTRIBUTION SHEET 2 OF 2
661	EL-108	GATEWAY STATION - COMMON CONTROLS PLC FAIL OVER SHEET 1 OF 2



MAUNSELL   AECOM		
Maunsell Australia Pty Ltd A.B.N. 20 093 866 925		
JUNE 27, 2008		
APPROVED	DATE	DESCRIPTION
		REVISIONS

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DMJM HARRIS | AECOM  
 FOUR GATEWAY CENTER  
 20TH FLOOR  
 PITTSBURGH, PA 15222  
 APPROVED \_\_\_\_\_ DATE \_\_\_\_\_

DESIGNED AP	PORT AUTHORITY OF ALLEGHENY COUNTY PITTSBURGH PENNSYLVANIA
DRAWN K	
CHECKED PG	
IN CHARGE LS	
DATE 06/27/08	
SCALE NTS	NORTH SHORE CONNECTOR NSC TRAIN SYSTEM (SYSTEM WIDE) INDEX OF DRAWINGS (SUBWAY TUNNEL FACILITY SYSTEMS) SHEET 9 OF 9
CONTRACT NO. NSC-009	
DWG. NO. GN-010	
SHT. 10	

Port Authority

## GENERAL NOTES

1. NOTIFY THE CITY OF PITTSBURGH DEPARTMENT OF PUBLIC WORKS (MR. LEONARD RECKER AT 412-255-2733) AT LEAST FORTY-EIGHT (48) HOURS IN ADVANCE OF ANY CONSTRUCTION WHICH MAY INVOLVE STREET MONUMENTS OR BENCHMARKS.
  2. MAPPING FOR THE NORTH SHORE CONNECTOR PROJECT WAS FLOWN ON FEBRUARY 12, 2001 BY BAE SYSTEM ADR. THE HORIZONTAL DATUM USED IS THE NORTH AMERICAN DATUM OF 1983 (NAD 1983) AND THE VERTICAL DATUM IS THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 1988).
  3. CONTROL SURVEY FOR THE NORTH SHORE CONNECTOR PROJECT WAS ESTABLISHED TO CONFORM TO A SECOND ORDER, CLASS II STANDARD OF CLOSURE. (I.e. 1:20,000)
  4. PROJECT HORIZONTAL GEOMETRY IS BASED ON STATE PLANE COORDINATES AT SEA LEVEL ELEVATION. TO CONVERT GRID LENGTHS TO GROUND LENGTHS AT PROJECT ELEVATION, MULTIPLY THE GRID LENGTH BY 1.0000404 OR CONVERSELY TO CONVERT GROUND LENGTHS TO GRID LENGTHS, MULTIPLY THE GROUND LENGTH BY 0.9999596. THE PROJECT FIELD SURVEY STAKEOUT HAS USED THESE CONVERSIONS FOR PROJECT HORIZONTAL CONTROL DATA.
  5. DO NOT INTERFERE WITH THE OPERATION OF ANY FIRE HYDRANT, FIRE CALL BOX OR POLICE CALL BOX, UNLESS DIRECTED BY THE CONTRACT DRAWINGS OR THE ENGINEER.
  6. CONFINE OPERATIONS WITHIN THE AUTHORITY'S RIGHT-OF-WAY INCLUDING SURFACE, SUBSURFACE AND TEMPORARY CONSTRUCTION EASEMENTS. THE CONTRACTOR'S WORK WILL ENCROACH WITHIN CITY OF PITTSBURGH EXISTING LEGAL RIGHT-OF-WAY.
  7. ALL DIMENSIONS ON CONTRACT DRAWINGS ARE MEASURED HORIZONTALLY, UNLESS OTHERWISE NOTED.
  8. ALL CONCRETE SURFACE REPLACEMENTS SHALL BE CONSTRUCTED TO THE NEAREST EXISTING CONSTRUCTION JOINT AT OR BEYOND THE END OF CONSTRUCTION. CONCRETE PAVEMENT RECONSTRUCTION LIMITS HAVE BEEN ESTABLISHED TO THE NEAREST EXISTING PAVEMENT JOINT. SAW CUT CONCRETE PAVEMENT AS DIRECTED. PAVEMENT RECONSTRUCTION LIMITS TIEING INTO EXISTING BITUMINOUS SURFACES WILL BE SAW CUT AND SEALED AS PER THE CONTRACT DRAWINGS.
  9. SLOPES DENOTED ON THESE DRAWINGS ARE SHOWN IN ENGLISH PROTOCOL AS 2:1. (TWO HORIZONTAL TO ONE VERTICAL)
  10. CONSTRUCT CURB TO MATCH EXISTING SIDE STREET CURB. CONSTRUCT SIDEWALKS FLUSH WITH TOP OF CURB UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
  11. ALWAYS ASSUME THE EXISTING UTILITY CONDUITS ARE ACTIVE. UTILITIES IDENTIFIED AS ABANDONED SHALL BE CONFIRMED WITH FACILITY OWNER BEFORE ANY WORK IS PERFORMED.
  12. UTILITIES SHOWN ON THE DRAWINGS REPRESENT THE EXTENT OF UTILITIES WHICH MAY BE IMPACTED BY CONSTRUCTION, NOT THE TOTAL EXTENT OF THE RESPECTIVE UTILITIES.
  13. THE CONTRACTOR SHALL BE AWARE THAT PORTIONS OF THE WORK ARE IN CLOSE PROXIMITY TO EXISTING BASEMENT WALLS AND UTILITY STRUCTURES. PERFORM EXPLORATORY INVESTIGATIONS AS DETAILED IN THE TECHNICAL PROVISIONS. IN THE EVENT THE LOCATION OF THE EXISTING STRUCTURES IS WITHIN THE PROPOSED CONSTRUCTION OR THE PROPOSED CONSTRUCTION ADVERSELY AFFECTS THE BASEMENT WALL OR VAULT OR UTILITY, CONTACT THE ENGINEER IMMEDIATELY FOR DIRECTION.
  14. SUPPLEMENTAL CONSTRUCTION DETAILS HAVE BEEN PROVIDED WITH THE CONTRACT DOCUMENTS. THE DRAWING PACKAGE TITLED "NORTH SHORE CONNECTOR SUPPLEMENTAL CONSTRUCTION DRAWINGS FOR THE CITY OF PITTSBURGH" HAS BEEN PROVIDED TO SUPPLEMENT THE CONTRACT DRAWINGS AND PENNDOT STANDARDS. THE ADDITIONAL DETAILS INCLUDE CITY OF PITTSBURGH "STANDARD" DETAILS. ALL DRAWINGS WERE DIGITALLY REPRODUCED FROM ORIGINAL SOURCES.
  15. THE LIMIT OF WORK FOR THIS PROJECT INCLUDES WORKS IN THE EXISTING CENTRAL BUSINESS DISTRICT (CBD) FROM MIDTOWN TO GATEWAY INCLUDING THE GATEWAY LOOP AND WORK ON THE NEW ALIGNMENT FOR GATEWAY STATION TO ALLEGHENY STATION INCLUDING THE TAIL TRACK / YARD.
  16. MANHOLE & VAULT COVERS SHOULD NOT BE LOCATED ON PAVEMENT JOINTS. COORDINATE JOINT LAYOUT WITH THE DRAINAGE & UTILITY PLANS.
  17. TEMPORARY CONSTRUCTION EASEMENT. AN AREA(S) REQUIRED UNTIL THE CONSTRUCTION OR WORK INDICATED BY THE PLAN IS COMPLETED, UNLESS SOONER REVERTED IN WRITING BY THE PORT AUTHORITY.
  18. REQUIRED EASEMENT LINE. AN AREA(S) WHICH SHALL ALLOW AUTHORITY TO ENTER THE PROPERTY AS NECESSARY TO CONSTRUCT OR ALTER THE SUB-SURFACE TRANSIT TUNNEL, RETAINED EARTH WALL, BRIDGE STRUCTURE, TRANSIT STATION AND TO SUCH FUTURE REASONABLE ENTRIES TO MAINTAIN THE ABOVE REFERENCED ITEMS FOR THE PROTECTION OF THE TRANSIT FACILITY. IT SHALL PREVENT THE OWNER FROM HAVING USE OF THE SURFACE FOR PARKING OR SIMILAR PURPOSES UNLESS NOTED IN WRITING BY AUTHORITY.
  19. PERMANENT EASEMENT. A SURFACE AREA(S) WHICH SHALL ALLOW AUTHORITY TO ENTER THE PROPERTY AS NECESSARY TO CONSTRUCT OR ALTER THE PEDESTRIAN PLAZA, EMERGENCY ACCESS LOCATIONS, AND TRANSIT STATION. IT SHALL PREVENT THE OWNER FROM HAVING USE OF THE SURFACE FOR PARKING OR SIMILAR PURPOSES WHICH SHALL DAMAGE OR REVISE THE USE OR INTENT OF THE PERMANENT EASEMENT.
  20. AUTHORITY RIGHT-OF-WAY PLANS AND DESCRIPTIONS HAVE BEEN PROVIDED IN THE RW SERIES.
  21. CONTRACT NSC-003/006 NORTH SHORE CONNECTOR, NORTH SIDE TUNNELS AND STATION SHELL CONSTRUCTION IS UNDER CONSTRUCTION AND AS A RESULT CERTAIN CHANGES TO THE NSC-003/006 CONTRACT DOCUMENTS HAVE OCCURRED AND CAN CONTINUE TO OCCUR IN THE FUTURE. KNOWN CHANGES INCLUDING, BUT NOT LIMITED TO, UTILITIES, TEMPORARY FACILITIES, SUPPORT OF EXCAVATION, AND MAINTENANCE AND PROTECTION OF TRAFFIC AND DETOURS. THE CONTRACTOR SHALL COORDINATE WITH THE NSC-003/006 CONTRACTOR AND THE ENGINEER TO OBTAIN CURRENT INFORMATION BEFORE CONTRACTOR BEGINS ITS WORK WHICH COULD BE AFFECTED BY THE NSC-003/006 CONSTRUCTION ACTIVITIES. SEE APPENDIX C-NORTH SHORE CONNECTOR, NORTH SIDE TUNNELS & STATION SHELL (NSC-003/006) CONSTRUCTION UPDATE FOR A LIST OF CHANGES TO THE NSC-003/006 CONTRACT DOCUMENTS INCLUDING A LIST OF SUBMITTALS WHICH DOCUMENT MAJOR CHANGES.

UTILITIES

DUQUESNE LIGHT COMPANY  
2825 NEW BEAVER AVENUE  
BUILDING 6  
MAIL DROP N6-CS  
PITTSBURGH, PA 15233-1003  
JIM RUNATZ-(412) 393-7813

— E —

EQUITABLE GAS COMPANY  
200 ALLEGHENY CENTER MALL  
PITTSBURGH, PA 15212-5352  
GEORGE POZZUTO-(412) 395-3127

— G —

GOVERNMENT AGENCIES

PENNSYLVANIA DEPARTMENT OF TRANSPORTATION  
DISTRICT 11-0  
45 THOMS RUN ROAD  
BRIDGEVILLE, PA 15107  
(412) 429-4800

PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SOUTHWEST REGIONAL OFFICE  
SOILS AND WATERWAYS SECTION  
400 WATERFRONT DRIVE  
PITTSBURGH, PA 15222  
(412) 442-5245

PORT AUTHORITY OF ALLEGHENY COUNTY  
HEINZ 57 CENTER  
345 SIXTH AVENUE, 3RD FLOOR  
PITTSBURGH, PA 15222-2527

U.S. ARMY CORPS OF ENGINEERS  
PITTSBURGH DISTRICT  
WM. S. MOREHEAD FEDERAL BUILDING  
1000 LIBERTY AVENUE  
PITTSBURGH, PA 15222  
(412) 395-7275

CITY OF PITTSBURGH  
PUBLIC WORKS  
611 2ND AVENUE  
PITTSBURGH, PA 15219  
(412) 255-2790

ALLEGHENY COUNTY  
CONSERVATION DISTRICT  
400 N. LEXINGTON AVENUE  
LEXINGTON TECH. PARK BUILDING  
PITTSBURGH, PA 15208  
(412) 241-7645

UNITED STATES POSTAL SERVICE  
700 GRANT STREET  
PITTSBURGH, PA 15219-1902  
(412) 624-4475

PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SOUTHWEST REGIONAL OFFICE  
BUREAU OF LAND RECYCLING & WASTE MANAGEMENT  
400 WATERFRONT DRIVE  
PITTSBURGH, PA 15222  
(412) 442-4000

PENNSYLVANIA HISTORICAL AND MUSEUM COMMISSION  
BUREAU OF HISTORIC PRESERVATION  
COMMONWEALTH KEYSTONE BUILDING, 2ND FLOOR  
400 NORTH STREET  
HARRISBURG, PA 17120-0093  
(717) 783-8946

ALLEGHENY COUNTY HEALTH DEPARTMENT  
3901 PENN AVENUE, BUILDING # 5  
PITTSBURGH, PA 15224-1318  
(412) 578-8047

ALLEGHENY COUNTY  
DEPARTMENT OF PUBLIC WORKS  
501 COUNTY OFFICE BUILDING  
542 FORBES AVENUE  
PITTSBURGH, PA 15219  
(412) 350-4005

CITY OF PITTSBURGH  
FORESTRY DIVISION  
DEPARTMENT OF PUBLIC WORKS  
6520 STANTON AVENUE  
PITTSBURGH, PA 15206  
DAVID JAHN-(412) 665-4316

PENNSYLVANIA DEPARTMENT  
OF TRANSPORTATION  
STANDARDS FOR CONSTRUCTION

RC- STANDARDS FOR ROADWAY CONSTRUCTION PUBLICATION 72  
BC-STANDARDS FOR BRIDGE CONSTRUCTION PUBLICATION 219  
TC-TRAFFIC STANDARDS - SIGNALS PUBLICATIONS 148

RC-11M (2 SHEETS)	TC-7600 (3 SHEETS)
RC-12M (2 SHEETS)	TC-7801 (4 SHEETS)
RC-20M (3 SHEETS)	TC-7802 (1 SHEET)
RC-21M (1 SHEET)	TC-7804 (2 SHEETS)
RC-27M (1 SHEET)	TC-7805 (1 SHEET)
RC-30M (5 SHEETS)	TC-7806 (2 SHEETS)
RC-32M (1 SHEET)	TC-8600 (8 SHEETS)
RC-34M (10 SHEETS)	TC-8602 (4 SHEETS)
RC-39M (6 SHEETS)	TC-8604 (4 SHEETS)
RC-52M (8 SHEETS)	TC-8702B (9 SHEETS)
RC-64M (1 SHEET)	BC-734M (3 SHEETS)
RC-70M (6 SHEETS)	BC-735M (1 SHEET)
RC-80M (2 SHEETS)	BC-736M (6 SHEETS)
RC-83M (2 SHEETS)	
RC-84M (1 SHEET)	

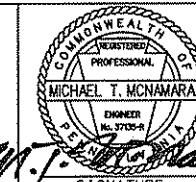
PA ONE CALL DESIGN SERIAL NUMBERS

OC75252 REEDSDALE STREET FROM NSC-007 LIMIT TO ART  
ROONEY AVE. - CITY OF PITTSBURGH - WARD 22

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 CATEWAY CENTER  
20TH FLOOR  
PITTSBURGH, PA. 15222  
CHECKED D HAINES  
IN CHARGE CD JONES  
DATE APR. 28, 2008  
SIGNATURE  
APPROVED DATE  
4/28/08

PORT AUTHORITY OF ALLEGHENY COUNTY  
PITTSBURGH  
NORTH SHORE CONNECTOR  
NSC TRAIN SYSTEM (SYSTEM-WIDE)  
GENERAL NOTES AND UTILITIES  
SHEET 2 OF 2  
Port Authority  
CONTRACT NO. NSC-009  
DWG NO. GN101 SHT. 12

A	B CONTINUED	C CONTINUED	D CONTINUED	E CONTINUED	G	I							
ABD.	ABANDONED	BLK.	BLOCK	COMB.	COMBINATION	DIA. OR DIAMETER	E-R	EXHAUST REGISTER	GA.	GAGE, GAUGE	I.B.	INBOUND	
A.F.F.	ABOVE FINISHED FLOOR	BLKG.	BLOCKING	COMB. S.	COMBINATION SEWER	Ø	EXIST.	EXISTING	GAL.	GALLON	IN. OR ()	"INCH	
ABUT.	ABUTMENT	B.O.V.	BLOW OFF VALVE	COMM.	COMMUNICATION	DIAG.	DIAGRAM	EXP.	EXPANSION	GPM	GALLONS PER MINUTE	INCL.	INCLUDING OR INCLUDING
A.DR.	ACCESS DOOR	BD.	BOARD	COMP.	COMPUTATION	DIAP.	DIAPHRAGM	EXP.BT.	EXPANSION BOLT	GPS	GALLONS PER SECOND	INC.	INCORPORATED
A.P.	ACCESS PANEL	F.B.M.	BOARD FEET	CONC.	CONCRETE	DIM.	DIMENSION	EXP.JT.	EXPANSION JOINT	GALV.	GALVANIZED	INFO.	INFORMATION
ACCEL.	ACCELERATION	BC	BOLT CIRCLE	C.C.	CONCRETE CONDUIT	DIR.	DIRECTIONAL OR DIRECT	XP	EXPLOSION PROOF	G.I.	GALVANIZED IRON	I.D.	INSIDE DIAMETER
ACCEL.	ACCELERATION	BORD.	BOROUGH	C.G.	CONCRETE GUTTER	DISC.	DISCONNECT	EXP.BLK.	EXPOSED BLOCK	G.S.	GALVANIZED STEEL	I.F.	INSIDE FACE
ACOUST.	ACOUSTICAL	B.E.F.B.	BORROW EXCAVATION	C.P.	CONCRETE PIPE	DISP.	DISPENSER	EXT.	EXTENSION	G.S.P.	GALVANIZED STEEL PIPE	INST.	INSTRUMENT
ADD.	ADDITION		BRIDGE FOUNDATION	C.M.U.	CONCRETE MASONRY UNIT	DIST.	DISTANCE	EXT. D.	EXTERNAL DISTANCE	GAR.	GARAGE	INSUL.	INSULATION
ADJ.	ADJUSTING OR ADJUSTABLE	B.F.	BOTH FACES	COND.	CONDITION	DP	DISTRIBUTION PANEL	EXT.	EXTERIOR	GSKT.	GASKET	INTEG.	INTEGRAL
P.M.	AFTERNOON	B.W.	BOTH WAYS	COND.	CONDUCTOR	DR.	DOOR	XHVV	EXTRA HEAVY	G.M.	GAS METER	INT.	INTERIOR
AGGR.	AGGREGATE	BOT.	BOTTOM	CONN.	CONNECTION OR CONNECT	DBL.	DOUBLE	XSTR	EXTRA STRENGTH	G.V.	GAS VALVE	INTER.	INTERMEDIATE
AHD.	AHEAD	B/B	BOTTOM OF BANK	CONRAIL	CONSOLIDATED RAIL CORP.	DBL. T.	DOUBLE THROW			GEN.	GENERAL	INV.	INVERT
AC	AIR CONDITIONING	B/C	BOTTOM OF CURB	CONST.	CONSTRUCT OR	DWLS.	DOWELS			G.A.E.C.	GENERAL ARCHITECTURAL/ ENGINEERING CONSULTANT	I.E.	INVERT ELEVATION
ACU	AIR CONDITIONING UNIT	B.C.	BOTTOM CUT	C.J.	CONSTRUCTION	DR.	DRAIN			G.C.	GENERAL CONTRACTOR	I.PIN	IRON PIN
A.V.	AIR VALVE	B.F.	BOTTOM FILL	CONT'D.	CONSTRUCTION JOINT	DN.	DOWN			GIR.	GIRDER	I.P.	IRON PIPE
ALIGN.	ALIGNMENT	B.W.	BOTTOM WALL	CONT'D.	CONTINUED	DWNSTRE.	DOWNTREAM			G.	GIGA		
AB	ALIGNMENT BEARING	B/D	BOTTOM OF DUCT	CONT.	CONTINUOUS OR	D.I.	DRAIN INLET	FAB.	FABRICATE	GL.	GLASS	J	
ALLOW.	ALLOWANCE	B/P	BOTTOM OF PANEL	CONTINUATION	CONTINUATION	DWG.	DRAWING	F TO F	FACE TO FACE	G.R.C.	GLASS REINFORCED CONC.	JAN. CLO.	JANITORS CLOSET
ALUM.	ALUMINUM	B/S	BOTTOM OF STAKE	CONTR.	CONTRACTION	DWGS.	DRAWINGS	F/C	FACE OF CURB	GOVT.	GOVERNMENT	J.T.	JOINT
ALT.	ALTERNATE	B.H.	BORE HOLE	CONT'R.	CONTRACTOR	Dmin	DRILLED SHAFT EMBEDMENT	F	FAHRENHEIT	GR.	GRADE	J	JOULE
A.C.	ALTERNATING CURRENT	B	BOULDER	CRC	CONTINUOUSLY REINFORCED	Dsr	DRILLED SHAFT EMBEDMENT	F.C.U.	FAN COIL UNIT	G.P.	GRADE POINT	J.CT.	JUNCTION
AMP.	AMPERE	BLVD.	BOULEVARD	CONCRETE	CONCRETE	D.F.	DRINKING FOUNTAIN	FED.	FEDERAL	GRAD.	GRADUATION	J.B.	JUNCTION BOX
ANCH.	ANCHOR	BDY.	BOUNDARY	CONTROL JOINT	CONTROL PANEL	DR.	DRIVE	FED. A.	FEDERAL AID	g	GRAM		
A-B.	ANCHOR BOLT	B.I.G.	BREAK IN GRADE	C.JT.	CONTROL PANEL	DRWY.	DRIVE WAY	FEMA	FED. EMERGENCY MANAGEMENT	GRTG.	GRATING		
ANT.	ANGLE	BRKR.	BREAKER	C.P.	COORDINATE	DP. I.	DROP INLET	FTA	FED. TRANSIT ADMINISTRATION	GRN.	GREEN	K	KILO
AMT.	AMOUNT	BRKT.	BRACKET	COORD.	COPPERWELD	D.S.P.	DRY STAND PIPE	FIS	FED. EMERGENCY MANAGEMENT	GRILLE	KG	KILOGRAM	
APPL.	APPLICATION	B.M.U.	BRICK MASONRY UNIT	CW.	(SURVEY MARKER)	D.F.	DUCT FURNACE	FTA	ADMINISTRATION FLOOD	GRD.	GRIND	Km	KILOMETER
APPR.	APPROACH	B.T.U.	BRITISH THERMAL UNIT	COR.	CORRUGATED	D.I.P.	DUCTILE IRON PIPE	FIS	INSURANCE STUDY	GRD.	GROUND	Km/h	KILOMETER PER HOUR
APP'D.	APPROVED	BRN.	BROWN	CORR.	CORRUGATED GALVANIZED	D.L.C.	DUQUESNE LIGHT COMPANY	FT. OR (	FEET	G.F. I.	GROUND FAULT	KN	KILO NEWTON
APPROX.	APPROXIMATE	BLDG.	BUILDING	C.G.S.P.	STEEL PIPE	DWLG.	DWELLING	FEET	FEET PER SECOND	G.R.	GROUND FAULT INTERRUPTER	KV	KILOVOLT
ARCH.	ARCHITECTURAL	B.L.	BUILDING LINE	C.M.	CORRUGATED METAL			FPM	FEET PER MINUTE	GUARD RAIL (FORMERLY	GUIDE RAIL (	KVA	KILO-VOLT-AMPERE
A.	AREA	B.U.	BUILT-UP	C.M.P.	CORRUGATED METAL PIPE			FP	FENCE POST	GUARD RAIL )	GUARD POST	KW	KILOWATT
A.D.	AREA DRAIN	BLKHD.	BULKHEAD	C.	COULOMB			FY.	FERRY	GYP.	GYPSUM	K	KIP OR KIPS
A.C.D.	ASBESTOS CEMENT DUCT (CONDUIT)	B.H.	BUSH HAMMER	CSK.	COUNTERSUNK	EA.	EACH	F.D.	FIBER DUCT, CONDUIT	GYP. BD.	GYPSUM BOARD	KSF	KIPS PER SQUARE FOOT
A.C.P.	ASBESTOS CEMENT PIPE			CD.	CAULKING	E.F.	EACH FACE	FIG.	FIGURE	KSI	KIPS PER SQUARE INCH	KLF	KIPS PER LINEAR FOOT
ASPH.	ASPHALT			CLKG.	CAPACITY	E.W.	EACH WAY	F.	FILL	K.O.	KNOCK OUT		
ASSY.	ASSEMBLY			CRSE.	CAST IRON	ESMT.	EASEMENT						
ASST.	ASSISTANT			C.I.	CAST IRON PIPE	E.	EAST						
ASSOC.	ASSOCIATE			C.I.P.	CAST-IN-PLACE	E.B.	EAST BOUND						
@ AT				C-I-P.	CAT.	E/C.	EDGE OF CONCRETE						
AUTO.	AUTOMATIC			CAT.	CATALOG	E/R.	EDGE OF ROAD						
A.A.V.	AUTOMATIC AIR VALVE			C.B.	CATENARY	E/P.	EDGE OF PAVEMENT						
A.T.C.	AUTOMATIC TEMPERATURE CONTROL			CLG.	CATCH BASIN	E/S.	EDGE OF SHOULDER						
AUX.	AUXILIARY			C.D.	CEILING DIFFUSER	E/STR.	EDGE OF STREAM						
AVE.	AVENUE			CELS.	CELSIUS	ELL.	ELBOW						
AVG.	AVERAGE			CEM.	CEMENT	ELEC.	ELECTRIC OR ELECTRICAL						
A.W.G.	AMERICAN WIRE GAUGE			C.T.B.	CEMENT TREATED BASE	E.P.B.	ELECTRIC PANEL BOARD						
				CEM.	CEMETERY	E.RWY.	ELECTRIC RAILWAY						
				CTR.	CENTER	E.T.L.	ELECTRIC TROLLEY LINE						
				CTRS.	CENTERS	E.W.C.	ELECTRIC WATER COOLER						
BK.	BACK			CU.	CENTER LINE	E.U.H.	ELECTRIC UNIT HEATER						
B'FILL	BACKFILL			m³	CENTER TO CENTER	E.MH.	ELECTRIC MANHOLE						
B.S.	BACKSIGHT			m³/s	CENTER OF GRAVITY	ELEV.	ELEVATION						
B.TO B.	BACK TO BACK			mm³	CAST IRON PIPE	EMB.	EMBANKMENT						
B.D.D.	BACK DRAFT DAMPER			mm³	CHAIN	EMB.	EMBED OR EMBEDMENT						
B&O	BALTIMORE AND OHIO RR.			mm³	CHAM.	EMER'G.	EMERGENCY						
BBL.	BARREL			mm³	CHAMFER	ENCL.	ENCLOSURE						
BASE	BASE LINE			mm³	CHANGE	E.D.	ENERGY DISSIPATER						
BSM'T.	BASEMENT			mm³	COR CHAN.	E.O.L.	END LINE RESISTOR						
BRG.	BEARING			mm³	CHANNEL	E. TO E	END TO END						
B&X	BELL AND SPIGOT			mm³	CHARPY-V-NOTCH	ED. W.	END WALL						
B.T.C.	BELL TELEPHONE COMPANY			mm³	CHECKED PLATE	ENGR.	ENGINEER						
BM	BENCH MARK			mm³	CHESSIE SYSTEM RR OR CSX	ENT.	ENTRANCE						
BTWN.	BETWEEN			mm³	CSX TRANSPORTATION CO	EQ. OR (=) EQUAL	FR. DWLG.						
BEV.	BEVELED			mm³	CHURCH	EQ.	FRENCH DWELLING						
BIT.	BITUMINOUS			mm³	CIRCLE OR CIRCULAR	EQU.	FRENCH DRAIN						
BCCMP	BITUMINOUS COATED CORRU-GATED GALVANIZED STEEL PIPE			mm³	CKT.	EQUIV.	FREEWAY						
BCBC	BITUMINOUS CONCRETE BASE COURSE			mm³	C/B	EST.	FREQUENCY						
B.S.C.	BITUMINOUS SURFACE COURSE			mm³	CITY OF PITTSBURGH	EXH.	FRESH AIR						
				mm³	CLASS	EXC.	FULL SCALE						
				mm³	DEPT.	F.	FUSE						
				mm³	DEPT. OF PUBLIC WORKS (C/P)	FUT.	FUTURE						
				mm³	DEP.	F/T	FUTURE TRACK						
				mm³	DET.								
				mm³	DSGN.								
				mm³	DIAG.								
				mm³	COL.								

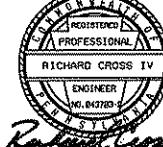
NO.	DATE	DESCRIPTION
		REVISIONS

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L		M CONTINUED		P CONTINUED		R CONTINUED		S CONTINUED		T CONTINUED		W	
LAB.	LABORATORY	MTBLE.	MOUNTABLE	PA	PENNSYLVANIA	REC.	RECESSED	SPA	SPACE OR SPACING	T	TOP	WK.	WALK
LAM.	LAMINATE	M.J.	MOVEMENT JOINT	P.A.W.C.	PENNSYLVANIA AMERICAN	REC.	RECESSED LIGHTING	SPCS	SPACES	T&B	TOP AND BOTTOM	W.H.	WALL HEATER
LAV.	LAVATORY	M.C.D.	MULTIPLE CONCRETE DUCT	PADER	PENNSYLVANIA DEPT. OF	RECONSTR.	RECONSTRUCT	SP.	SPARE	TOPO	TOPOGRAPHY	WHSE.	WAREHOUSE
LAT.	LATITUDE	M.T.D.	MULTIPLE TILE DUCT	PENNDOT	PENNSYLVANIA DEPARTMENT	RECT.	RECTANGLE	SPEC.	SPECIFICATION	T/B	TOP OF BANK	W.B.	WATER BOX
LT.	LEFT		N		OF TRANSPORTATION	REDR.	REDRESSED	S.L.	SPRING LINE	T/CONC.	TOP OF CONCRETE	W.C.	WATER CLOSET
L.H.	LEFT HAND					REF.	REFERENCE	SAP	SPRINKLER ALARM PANEL	T/C	TOP OF CURB	W.M.	WATER METER
L/T	LEFT TRACK					R.N.	REFERENCE NORTH	SQ.	SQUARE	T/G	TOP OF GRATE	WP.	WATERPROOFING
LGTH.	LENGTH	NAT'L.	NATIONAL	PNGCO.	PEOPLES NATURAL GAS	REFL.	REFLECTION OR REFLECTOR	SQ.FT.OR	SQUARE FOOT	T/GRTG.	TOP OF GRATING	W.S.	WATER SPIGOT
Lb	LENGTH (MINIMUM BONDED)	N.G.V.D.	NATIONAL GEODETIC	%	COMPANY	REG.	REGULAR	S.Q.	SQUARE INCH	T/F	TOP OF FILL	W.T.	WATER TABLE
Id.	LENGTH OF DEVELOPMENT		VERTICAL DATUM	P.C.M.P.	PERCENT	REG.	REGISTER	SQ.IN.OR	SQUARE INCH	T/R	TOP OF RAIL	WV	WATER VALVE
L+	LENGTH (ESTIMATED TOTAL)	N.G.S.	NATIONAL GEODETIC SURVEY		PERFORATED CORRUGATED	REINF.	REINFORCED, REINFORCE-	S.I.	SQUARE INCH	T/W	TOP OF WALL	WATT	
LU	LENGTH (MINIMUM UNBONDED)	NAT.	NATIVE OR NATURAL		METAL PIPE		MENT OR REINFORCING	KM <sup>2</sup>	SQUARE KILOMETERS	TF	TOTAL FILL	W.S.	WEARING SURFACE
LGT.	LIGHT	N.F.	NEAR FACE	PERF.	PERFORATED	R.C.C.	REINFORCED CEMENT	M <sup>2</sup>	SQUARE METERS	TWP.	TOWNSHIP	W.P.	WEATHERPROOF
LTG.	LIGHTING	N.S.	NEAR SIDE	PERM.	PERMANENT		CONCRETE	MM <sup>2</sup>	SQUARE MILLIMETERS	TRK.	TRACK	W.H.	WEEP HOLES
LED	LIGHT EMITTING DIODE	NEG.	NEGATIVE	PERP.	PERPENDICULAR	R.C.P.	REINFORCED CONCRETE	STAG	STAGGERED	TR.	TRAFFIC	WT.	WEIGHT
LS	LIGHT STANDARD	NEUT.	NEUTRAL	PGH	PITTSBURGH		PIPE	STWY.	STAIRWAY	T.C.B.	TRAFFIC CALL BOX	WWF	WELDED WIRE FABRIC
LRT	LIGHT RAIL TRANSIT	N	NEWTON	PWSA	PGH. WATER & SEWER AUTHORITY	R.E.C.P.	REINFORCED ELLIPTICAL	S.P.	STAND PIPE	T.S.	TRAFFIC SIGNAL	WSP	WELDED STEEL PIPE
LRV	LIGHT RAIL VEHICLE	NOM.	NOMINAL	PL	PLANE OR PLAIN	REM.	CONCRETE PIPE	STD.	STANDARD	TRANS.	TRANSFORMER	WSPCC	WELDED STEEL PIPE,
LIN.	LINEAR OR LINEAL	NOM.NF	NOMINAL NON-FUSED	PCC OR PLCC	PLAIN CEMENT CONCRETE	REQ'D.	REMOVAL OR REMOVE	SR	STATE ROUTE	T.A.	TRANSFER AIR	W.U.	COATED
L.A.	LIMITED ACCESS	N&W	NORFOLK & WESTERN RAILWAY	P.D.	PLASTIC CONDUIT DUCT	REQUIRED	REMOVED	STA.	STATION	TRANV.	TRANSVERSE	TELEGRAPH COMPANY	COATED, CEMENT LINED
L.F. OR LINEAR FOOT	LIN.FT.	NS	NORFOLK SOUTHERN RAILWAY	PL.	PLATE	RET.	RETAINING	STM.	STEAM	T	TREAD		
L	LITER	NDR.	NORMAL	PLATF.	PLATFORM	RET.	RETURN	STL.	STEEL	TR.	TRIP	W	WEST
L-L.	LIVE LOAD	N.C.	NORMALLY CLOSED	PLMB.	PLUMBING (PLUMBER)	R.A.	RETURN AIR	STL.P.	STEEL PIPE, DUCT, CONDUIT	T.P.	TURNING POINT	W.B.	WEST BOUND
LOCA.	LOCATION	N.O.	NORMALLY OPEN	PLWD.	PLYWOOD	RLS.	RETURN LINE, STEAM	STIFF.	STIFFENER	TYP.	TYPICAL	W.P.P.C.	WEST PENN POWER COMPANY
LG.	LONG		NORTH	P/T	POCKET TRACK	REV.	REVERSE	STIR.	STIRRUP			W.U.	WESTERN UNION
LONG.	LONGITUDE OR	N.B.	NORTH BOUND	PT.	POINT	REV.	REVISION	STG.	STORAGE			W.S.P.	TELEGRAPH COMPANY
	LONGITUDINAL	N.E.	NORTHEAST	P.C.	POINT OF CURVE	RPM	REVOLUTION PER MINUTE	S.A.	STORAGE AREA			W&E R.R.	WHEELING AND LAKE ERIE
LV.	LOUVER	N.W.	NORTHWEST	PT.	POINT OF TANGENT	RT.	RIGHT	STR.	STRINGER	UD OR	UNDERDRAIN	RAILROAD	
L.P.	LOW POINT	N.A.	NOT APPLICABLE	P.C.B.	POLICE CALL BOX	R.H.	RIGHT HAND	STR.RM.	STORAGE ROOM	U-DRAIN			
LP	LOW PRESSURE	N.I.C.	NOT IN CONTRACT	PVC	POLYVINYL CHLORIDE	R/W	RIGHT-OF-WAY	SS	STORM SEWER	U.P.V.	UNDER PLATFORM	WDW.	WINDOW
L.P.S.	LOW PRESSURE SODIUM	NTS	NOT TO SCALE	PAT OR	PORT AUTHORITY OF	R/T	RIGHT TRACK	STY.	STORY		VENTILATION	W.W.	WING WALL
L.W.M.	LOW WATER MARK	NO. OR #()	NUMBER	PAAC	ALLEGHENY COUNTY	R	RISER	STR.	STREAM	UNFIN.	UNFINISHED	W.GL.	WIRE GLASS
LUB.	LUBRICATE	NOS.	NUMBERS	P.C.C.	PORTLAND CEMENT CONCRETE	RD.	ROAD	ST.	STREET	U.H.	UNIT HEATER	W/	WITH
LBR.	LUMBER			POS.	POSITION	RDWY.	ROADWAY	S.L.	STREET LIGHTING	U.P.S.	UNINTERRUPTED POWER	W/O	WITHOUT
Im	LUMEN			LB., LBS.	POUND OR POUNDS	RM.	ROOM	STRUCT.	STRUCTURAL	U.S.G.S.	U.S. GEOLOGICAL SURVEY	W.	WOOD
LS	LUMP SUM			PCF	POUNDS PER CUBIC FOOT	RAC	ROOM AIR CONDITIONER	STR.	STRUCTURE	UNIV.	UNIVERSAL	W.P.	WORK POINT
Ix	LUX	O.C.	ON CENTER	PSF	POUNDS PER SQUARE FOOT	RF.	ROOF	SUBG. OR	SUBGRADE	U.N.	UNLESS NOTED	W.I.	WRUGHT IRON
		/	OFFSET	PSI	POUNDS PER SQUARE INCH	RF.D.	ROOF DRAIN	S.G.	SUPERSTRUCTURE	U.O.N.	UNLESS OTHERWISE NOTED	W.I.P.	WRUGHT IRON PIPE
		OFF.	OPENING	PP	POWER PANEL	R.T.D.	ROUND TILE DUCT	S.A.	SUPERVISOR	UPSTREAM		YD.	YARD
		OPNG.	OPENING	PPB	POWER PANEL BOARD	R.O.	ROUGH OPENING	SUP.	SUPPORT	UPL	UTILITY POLE WITH	YR.	YEAR
		OGS	OPEN GRADAGE SUBBASE	P.P.	POWER POLE	RTE.	ROUTE	SURF.	SURFACE	LUMINARIES	YEL.	YELLOW	
		OPP.	OPPOSITE	PRI.	PRIMARY			SAN. S	SANITARY SEWER	VAC.	VACANT		
		OPP.HD.	OPPOSITE HAND	PCST.	PREFABRICATED			SAN. MH.	SANITARY SEWER MANHOLE	VAC.	VACUUM		
		OPT.	OPTIONAL	PRELIM.	PRELIMINARY			SCH.	SCHEDULE	VAL.	VALVE		
		ORN.	ORANGE	PMLD.	PREMOLDED			SCR	SCREW	VP.	VAPOR OR VAPOR PROOF		
		ORIG.	ORIGINAL	PRESS.	PRESSURE			SEC.	SECOND	VAR.	VARIABLE		
		O.G.	ORIGINAL GRADE	P/S	PRESTRESSED			SECT.	SECTION	VE.	VENT		
		OZ.	OUNCE	P/C.P.	PRESTRESSED CONCRETE			SEG.	SEGMENT	V.T.R.	VENT THRU ROOF		
		OB.	OUTBOUND	PROC.	PROCESS			SEL.	SELECT	VENT.	VENTILATION		
		O.A.	OUTSIDE AIR	PROD.	PRODUCTION			SEP.	SEPARATE	VIF.	VERIFY IN FIELD		
		O.D.	OUTSIDE DIAMETER	PG	PROFILE GRADE			SERV.	SERVICE	VERT.	VERTICAL		
		O.F.	OUTSIDE FENCE	PROJ.	PROJECTION			S.S.	SERVICE SINK	V.C.L.	VERTICAL CONTROL LINE		
		O TO O	OUTSIDE TO OUTSIDE OR	PGL	PROFILE GRADE LINE			SHT.	SHEET	TEL.	TELEPHONE		
			DUT TO DUT	PROJ.	PROPERTY LINE			SHD.	SHOULDER	T.B.	TELEPHONE BOOTH		
		M.S.L.	MEAN SEA LEVEL	OS&Y	OUTSIDE SCREW AND YOKE	P.	PROPOSED	SH.	SHOWER	T.P.	TELEPHONE POLE	Vm	VERTICAL METER
		MECH.	MECHANICAL	OA.	OVERALL	PUB.	PUBLICATION	SH.D.	SHOWER DRAIN	TEMP.	TEMPERATURE	VCP	VITRIFIED CLAY PIPE
		MSE	MECHANICALLY STABILIZED EARTH	O.H.	OVERHEAD	PD	PUMP DISCHARGE	SDWK.	SIDEWALK	TEMP.C.	TEMPERATURE CONTROL	VCPX	VITRIFIED CLAY PIPE
		M.	MEGA			P.B.	PUSH-BUTTON			TEMP.	TEMPORARY		EXTRA STRENGTH
		MER.	MERIDIAN							TAN.	TANGENT		
		MET.	METAL							TRP.	TAPER		
		m	METER							TECH.	TECHNICAL		
		m/s	METERS PER SECOND	P.	PAGE					TCMD	TERRA COTTA MULTIPLE		
		tonne	METRIC TON	PP.	PAGES						DUCTS		
		MEZZ.	MEZZANINE	PR.	PAIR						TERRA COTTA PIPE		
		MI	MILE	PNL.	PANEL					TCSD	TERRA COTTA SINGLE		
		M.P.H.	MILE PER HOUR	PAR.	PARAGRAPH	QUAD.	QUADRANT				DUCT		
		m	Milli	PAR.	PARALLEL	QUAL.	QUALITY				TEST BORING		
		mm	millimeter	PK	PARKER-KALON NAIL	QT.	QUART				THICK		
		MIN.	MINIMUM	PKG.	PARKING	QTR.	QUARTER				M.		
		MIN.	MINUTE	PKG.M.	PARKING METER						THOUSAND		
		MISC.	MISCELLANEOUS	PKWY.	PARKWAY						THD.		
		M.C.C.	MOTOR CONTROL CENTER	PARTN.	PARTITION	RAD.	RADIAL				THREAD		
		M.D.	MOTOR DAMPER	PAT.	PATENT	rad.	RADIAN				THRESH.		
		MTN.	MOUNTAIN	Pg	PASCAL	R.	RADIUS				THRESHOLD		
		MON.	MONUMENT	PAV'T.	PAVEMENT	R.W.C.	RAIN WATER CONDUCTOR				THRU		
		MTD.	MONTED	PBD	PAVEMENT BASE DRAIN	R.R.	RAILROAD						

TRACK ABBREVIATIONS

AREMA	AMERICAN RAILWAY ENGINEERING AND MAINTENANCE ASSOCIATION
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
ATEA	AMERICAN TRANSIT ENGINEERING ASSOCIATION
BEG	BEGIN
CND	CONDUIT
CWR	CONTINUOUS WELDED RAIL
DF	DIRECT FIXATION
I.	CENTRAL ANGLE OF OVERALL CURVE
L/T	LEFT TRACK
MCM	THOUSAND CIRCULAR MILS
P-C-C	PRE-CAST-CONCRETE
P.S.	POINT OF SWITCH
P.I.T.O.	POINT OF INTERSECTION, TURNOUT
P/T	POCKET TRACK
QTY	QUANTITY
RBM	RAIL BOUND MANGANESE
R/T	RIGHT TRACK
SJ	SPECIAL JOINT
SM	SOLID MANGANESE
SW	SWITCH
TO	TURNOUT
X-ING	CROSSING
X-OVER	Crossover

 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.	 <b>RICHARD CROSS IV</b> <small>PROFESSIONAL ENGINEER NO. 0417025</small> <i>[Signature]</i>	<b>DMJM HARRIS   AECOM</b> FOUR GATEWAY CENTER 20TH FLOOR PITTSBURGH, PA. 15222  <i>[Signature]</i> <b>David J. Hearn</b> 4/28/08 <small>SIGNATURE APPROVED DATE</small>	DESIGNED BY JF BARBIERE DRAWN BY JF BARBIERE  CHECKED BY MJ HEARN IN CHARGE BY R CROSS DATE APR. 28, 2008  SCALE NTS <small>NTS</small>	<b>PORT AUTHORITY OF ALLEGHENY COUNTY</b> <small>PITTSBURGH, PENNSYLVANIA</small>	
	NO.	DATE	DESCRIPTION					REVISIONS	NORTH SHORE CONNECTOR NSC TRAIN SYSTEM (SYSTEM-WIDE) STANDARD ABBREVIATIONS TRACK
							<b>Port Authority</b> <small>TRANSPORTATION</small>	CONTRACT NO. NSC-009 DWG. NO. GN202 SHT. 15	

OCS ABBREVIATIONS

AMP	AMPERE	E	EAST	LB	POUND, POUNDS	QTY	QUANTITY	UG	UNDERGRADE, UNDERGROUND
AB	ANCHOR BOLT	EA	EACH	LB/FT	POUNDS PER FOOT			UNO	UNLESS NOTED OTHERWISE
ABUT	ABUTMENT	EQ	SUPERELEVATION IN INCHES	LF	LINEAR FEET			U/S	UNDERSIDE
ABV	ABOVE	EHS	EXTRA HIGH STRENGTH	LG	LONG			UTIL	UTILITY
AC	ALTERNATING CURRENT	ELEC	ELECTRICAL	LOC	LOCATION	R	RADIUS		
ACI	AMERICAN CONCRETE INSTITUTE	EL,ELEV	ELEVATION	LPT	LOW POINT	RECT	RECTIFIER		
ACSR	ALUMINUM CONDUCTOR STEEL REINFORCED	EQ	EQUAL	LS	LUMP SUM	REF	REFERENCE		
ADJ	ADJACENT	EQN	EQUATION	LT	LIGHT, LEFT	REV	REVISE		
A/G	AT GRADE	EQUIP	EQUIPMENT	M	MESSANGER (STAGE I)	REQD	REQUIRED		
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION	EXIST	EXISTING	MAX	MAXIMUM	ROW	RIGHT-OF-WAY	V	VOLT
ANC	ANCHOR	F	FAHRENHEIT	MCM	THOUSAND CIRCULAR MILS	RT	RIGHT	VA	VOLT AMPS
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE	FA	FIXED ANCHOR	MESS	MESSANGER	RTU	REMOTE TERMINAL UNIT	VERT	VERTICAL
APPROX	APPROXIMATE	FDN	FOUNDATION	M/W	MESSANGER WIRE	RR	RAILROAD	V/S	VERSINE
AREMA	AMERICAN RAILWAY ENGINEERING & MAINTENANCE OF WAY ASSOCIATION	FDR	FEEDER	MIN	MINIMUM				
ASSY	ASSEMBLY	FFJ	FULL FEEDING JUMPER	MISC	MISCELLANEOUS	S	SOUTH		
ASTM	AMERICAN SOCIETY OF TESTING & MATERIALS	FJ	FEEDER JUMPER	M/L	MAIN LINE	SA	SURGE ARRESTER	W	WATT
A/T	AUTO TENSION	FLEX	FLEXIBLE	MOP	MOTOR OPERATED	SB, S.B.	SOUTH BOUND	W/	WITH
ATR	ABOVE TOP RAIL	FRE	FIBERGLASS REINFORCED EPOXY	MOV	METAL OXIDE VARISTOR	SCADA	SUPERVISORY CONTROL AND DATA ACQUISITION	W/O	WITHOUT
AUX	AUXILIARY	FOP	FACE OF POLE	MP	MILE POST	SECT	SECTION	WF	WIDE FLANGE
AVG	AVERAGE	FOS	FACTOR OF SAFETY	MPA	MID POINT ANCHOR	SC	SPIRAL-TO-CURVE	WWF	WELDED WIRE FABRIC
AWG	AMERICAN WIRE GAUGE	FP	FEEDER POLE	MPH	MILES PER HOUR	SCH	SCHEDULE		
AWS	AMERICAN WELDING SOCIETY	F.S.	FAR SIDE	MTG	MOUNTING	SI	SECTION INSULATOR		
		FT	FEET, FOOT	mV	MILIVOLT	SIG	SIGNAL		
		F TO F	FACE TO FACE			SOP	SET OUT POINT	XFMR	TRANSFORMER
		F/T	FIXED TERMINATION			SPEC	SPECIFICATION	X-ING	CROSSING
		FTA	FIXED TERMINATION ANCHOR			SPS	SMALL PART STEELWORK	X/O,X/OVER	Crossover
B/B	BACK TO BACK					SPST	SINGLE POLE SINGLE THROW		
BIL	BASIC INSULATION LEVEL					SQ	SQUARE		
BR	BRIDGE	GALV	GALVANIZED	N	NORTH	ST	STREET, SPIRAL TO TANGENT		
BRKT	BRACKET	G/L	GROUND LINE	N/A	NOT APPLICABLE	STA	STATION, STATIONING		
B, BTM	BOTTOM	GND	GROUND	NB, N.B.	NORTH BOUND	STD	STANDARD	Y.YD	YARD
BWA	BALANCE WEIGHT ANCHOR	GRS	GALVANIZED RIGID STEEL	NC	NORMALLY CLOSED	STRUCT	STRUCTURE		
BZ	BRONZE			NE	NORTHEAST	SUSP	SUSPENDED		
		H	HEIGHT,HIGH	NEC	NATIONAL ELECTRIC CODE	SW	SWITCH		
		HD	HARD DRAWN	NESC	NATIONAL ELECTRICAL SAFETY CODE	SWA	SINGLE WIRE ANCHOR		
		HH	HAND HOLE	NEG	NEGATIVE	SWFT	SINGLE WIRE FIXED TERMINATION		
CANT	CANTILEVER	HEX	HEXAGONAL	NIC	NOT IN CONTRACT	SWH	SWITCH HEATER		
CBD	CENTRAL BUSINESS DISTRICT	HO	HAND OPERATED	ND	NORMALLY OPEN	SYS	SYSTEM		
CBK	CIRCUIT BREAKER	HORIZ	HORIZONTAL	NOM	NOMINAL				
CF	CUBIC FEET	HRL	HIGH RAIL LEVEL	NR	NOT REGISTERED				
CKT	CIRCUIT	H-SPAN	HEAD SPAN	N.S.	NEAR SIDE				
€	CENTERLINE	HV	HIGH VOLTAGE	NS	NOT SUPPORTED				
C TO C	CENTERLINE TO CENTERLINE	HS	HIGH STRENGTH	NTS	NOT TO SCALE				
CLD	CLAD	Hz	HERTZ						
CJ	CONTINUITY JUMPER								
CLR	CLEARANCE, CLEAR								
COMM	COMMUNICATIONS								
CONC	CONCRETE	IB	INBOUND						
COND	CONDUCTOR	I/C	SINGLE CONDUCTOR						
CONST	CONSTRUCTION	ID	INSIDE DIAMETER						
CONT	CONTINOUS	IEEE	INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS						
CT	CURRENT TRANSFORMER	IN	INCH, INCHES						
CS	CURVE-TO-SPIRAL	IJ	INSULATED JOINT						
CTR	CENTER	I/R, IR	IN RUNNING (RIDING CONTACT WIRE)						
CU	COPPER								
C/W	CONTACT WIRE								
CY	CUBIC YARD								
D,DC	DEGREE OF CURVATURE	J	JUMPER	PAN	PANTOGRAPH	T	TOP, TROLLEY (STAGE I)		
DC	DIRECT CURRENT	JB	JUNCTION BOX	PAAC	PORT AUTHORITY OF ALLEGHENY COUNTY	TB	TERMINAL BLOCK		
D.E.	DEAD END	JCT	JUNCTION	PC	PONT OF CURVE	TBD	TO BE DETERMINED		
DEG	DEGREE	K	KIP	PF	POINT OF FROG	TBR	TO BE REMOVED		
DET	DETAIL	KA	KILOAMPERE	PI	POINT OF INTERSECTION	TCR	THYRISTOR CONTROLLED RECTIFIER		
DGA	DOWN GUY ANCHOR	KCMIL	THOUSAND CIRCULAR MILS (=MCM)	PITO	POINT OF INTERSECTION OF TURNOUT	TEMP	TEMPERATURE, TEMPORARY		
DIA	DIAMETER	KV	KILOVOLT	PL, P	PLATE	TERM	TERMINAL, TERMINATION		
DIM	DIMENSION	KVA	KILOVOLT AMPERE	P/L	PROPERTY LINE	T/F	TOP OF FOUNDATION		
DIST	DISTRIBUTION	KSF	KIPS PER SQUARE FOOT	PNL	PANEL	T/G	TOP OF GROUND LINE		
DWG	DRAWING	KSI	KIPS PER SQUARE INCH	POS	POSITIVE	TL	TENSION LENGTH		
		KW	KILOWATT	PS	POINT OF SWITCH	T/LR	TOP OF LOW RAIL		
				PSF	POUNDS PER SQUARE FEET	TO	TURNOUT		
				PSI	POUNDS PER SQUARE INCH	T/C	TOP OF CONCRETE		
				PT	POINT OF TANGENT, POTENTIAL TRANSFORMER	TOR	TOP OF RAIL		
				PVC	POINT OF VERTICAL CURVE,POLYVINYL CHLORIDE	TP	TRACTION POWER		
				PWR	POWER	TPSS	TRACTION POWER SUBSTATION		
						T/R	TOP OF RAIL		
						TRK	TRACK		
						TS	TANGENT TO SPIRAL		
						TWA	TIE WIRE ANCHOR		
						TYP	TYPICAL		

Gannett Fleming Transit & Rail Systems	NO. DATE	DESCRIPTION	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.	
			REVISIONS	REVISIONS

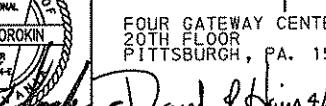
 <b>PROFESSIONAL</b> <b>REGISTERED</b> <b>TERRY A. SHANTZ</b> <small>REG. NO. 3747-E</small>		DMJM HARRIS   AECOM	DESIGNED BY SR ADKINS
		DRAWN BY HT TRAN	
		CHECKED BY TA SHANTZ	<b>PORT AUTHORITY OF ALLEGHENY COUNTY</b> PITTSBURGH  NORTH SHORE CONNECTOR NSC TRAIN SYSTEM (SYSTEM-WIDE) STANDARD ABBREVIATIONS OCS
		IN CHARGE CD JONES	
		DATE APR. 28, 2008	
		APPROVED BY DAVID P. HAY	
		DATE 4/28/08	
		SCALE NTS	
		Port Authority	
		CONTRACT NO. NSC-009	
		DWG. NO. GN203	
		SHT. 16	

**PORT AUTHORITY OF ALLEGHENY COUNTY**  
 PITTSBURGH  
  
 NORTH SHORE CONNECTOR  
 NSC TRAIN SYSTEM (SYSTEM-WIDE)  
 STANDARD ABBREVIATIONS  
 OCS

Port Authority  
 Contract No. NSC-009  
 DWG. No. GN203 Sht. 16

### TRACTION POWER ABBREVIATIONS

A	AMMETER	D,DC	DEGREE OF CURVATURE	K	KIP	R	RADIUS OF RED	UG	UNDERGRADE. UNDERGROUND
ACK	ACKNOWLEDGE	DC	DIRECT CURRENT	KA	KILOAMPERE	RE	RUNNING EDGE OF RAIL	UGB	UNDERGRADE BRIDGE
AMP	AMPERE	DEG	DEGREE	KCMIL	THOUSAND CIRCULAR MILS	RECT	RECTIFIER	UON	UNLESS OTHERWISE NOTED
AB	ANCHOR BOLT	DET	DETAIL	KV	KILOVOLT	REF	REFERENCE	U/S	UNDERSIDE
ABD	ABANDON, ABANDONED	DEV	DEVICE	KVA	KILOVOLT AMPERE	REV	REVISE	UTIL	UTILITY
ABUT	ABUTMENT	DIA	DIAMETER	KSF	KIPS PER SQUARE FOOT	REQD	REQUIRED	UTMH	UTILITY MANHOLE
ABV	ABOVE	DIM	DIMENSION	KSI	KIPS PER SQUARE INCH	ROW	RIGHT-OF-WAY	UPS	UNINTERUPPTIBLE POWER SUPPLY
AC	ALTERNATING CURRENT	DISC	DISCONNECT	KW	KILOWATT	RT	RIGHT	V	VOLT/VOLTMETER
ACI	AMERICAN CONCRETE INSTITUTE	DISC SW	DISCONNECT SWITCH	LB	POUND, POUNDS	RTU	REMOTE TERMINAL UNIT	VA	VOLT AMPS
ACSR	ALUMINUM CONDUCTOR STEEL REINFORCED	DIST	DISTRIBUTION	LB/FT	POUNDS PER FOOT	RR	RAILROAD	VERT	VERTICAL
ADJ	ADJACENT	DLGT	DOME LIGHT	LG	LONG, LENGTH	RRX	RAILROAD GRADE CROSSING	V/S	VERSINE
AFF	ABOVE FINISHED FLOOR (LEVEL)	DLC	DUQUESNE LIGHT COMPANY	LGT	LIGHTING	RW	RETAINING WALL (R/W)	W	WATT
AF	AMPERES FRAME	DWG	DRAWING	LOC	LOCATION	R/R	RUNNING RAIL	W/	WITH
A/G	AT GRADE	E	EAST	LPT	LOW POINT	S	SOUTH	WI	WEIGHT - WROUGHT IRON
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION	EA	EACH	LS	LUMP SUM	SA	SURGE ARRESTER	WIL	WHITE INDICATION LIGHT
AIR-COND	AIR CONDITIONING UNIT	Ed	SUPERELEVATION IN INCHES	LT	LIGHT LEFT	SB	SOUTH BOUND	W/O	WITHOUT
AIC	AMP INTERRUPTING CURRENT	EHS	EXTRA HIGH STRENGTH	LRT	LIGHT RAIL TRANSIT SYSTEM	SCADA	SUPERVISORY CONTROL AND DATA ACQUISITION	WF	WIDE FLANGE
ANC	ANCHOR	ELEC	ELECTRICAL	m	METER	SECT	SECTION	WWF	WELDED WIRE FABRIC
ANN	ANNUNCIATOR	EL,ELEV	ELEVATION	m/s	METERS PER SECOND	SCH	SCHEDULE		
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE	EM,EMERG	EMERGENCY	mm	MMILLIMETER	SIG	SIGNAL		
AP	APPROACH	EPP	EMERGENCY POWER PANEL	MAX	MAXIMUM	SL	STROBE LIGHT	XFRMR	TRANSFORMER
APPROX	APPROXIMATE	EQ	EQUAL	MCOV	MAXIMUM CONTINUOUS OPERATING VOLTAGE	SONET	SYNCHRONOUS OPTICAL NETWORK	X-INC	CROSSING
APT	AUXILIARY POWER TRANSFORMER	EQN	EQUATION	MH	MANHOLE	SOP	SET OUT POINT	X/O	CROSSOVER
APC	ALLEGHENY POWER COMPANY	EQUIP	EQUIPMENT	MIN	MINIMUM	SPEC	SPECIFICATION	X/OVER	CROSSOVER
APP	AUXILIARY POWER PANEL	ETS	EMERGENCY TRIP STATION	MISC	MISCELLANEOUS	SPS	SMALL PART STEEL WORK	X-SECT	CROSS SECTION
AREA	AMERICAN RAILWAY ENGINEERING ASSOCIATION	EX	EXHAUST	M/L	MAIN LINE	SPST	SINGLE POLE SINGLE THROW	X-SPAN	CROSS SPAN
ASSY	ASSEMBLY	EXIST	EXISTING	MR	MULTIRATIO	SQ	SQUARE	Y,YD	YARD
ASTM	AMERICAN SOCIETY OF TESTING & MATERIALS	F	FAHRENHEIT	MOD	MOTOR OPERATED DISCONNECT	SQ mm	SQUARE MILLIMETERS	YL	YARD LEAD
AS	AMMETER SWITCH	FA	FIXED ANCHOR	MOP	MOTOR OPERATED	SSP	SIGNAL SERVICE PANEL		
AT	AMPERE TRIP	FDN	FOUNDATION	MOV	METAL OXIDE VARISTOR	SST	STAINLESS STEEL		
ATS	AUTOMATIC TRANSFER SWITCH	FDR	FEEDER	MP	MILE POST - MORE PERMISSIVE SPEED	STA	STATION, STATIONING		
ATR	ABOVE TOP RAIL	FFJ	FULL FEEDER JUMPER	MTS	MANUAL TRANSFER SWITCH	STAT	STATUS		
AUX	AUXILIARY	FJ	FEEDER JUMPER	mV	MILIVOLT	STD	STANDARD		
AVG	AVERAGE	FLEX	FLEXIBLE	N	NORTH OF NEWTON	STRUCT	STRUCTURE		
AWG	AMERICAN WIRE GAUGE	FRE	FIBERGLASS REINFORCED EPOXY	N/A	NOT APPLICABLE	SUBSTN	SUBSTATION		
AWS	AMERICAN WELDING SOCIETY	FREQ	FREQUENCY	NB	NORTH BOUND	SUSP	SUSPENDED		
B	BLUE	FOP	FACE OF POLE	NBR	NON-BRIDGING	SW	SWITCH		
BATT	BATTERY	FOS	FACTOR OF SAFETY	N.C.	NORMALLY CLOSED	SWBD	SWITCHBOARD		
BCB	BATTERY CIRCUIT BREAKER	FP	FEEDER POLE	NE	NORTHEAST	SWGR	SWITCHGEAR		
B/B	BACK TO BACK	F TO F	FACE TO FACE	NEC	NATIONAL ELECTRIC CODE	SWHT	SWITCH HEATER		
BFA	BY-PASS FEEDER ANCHOR	FTC	FOOTING	NESC	NATIONAL ELECTRIC SAFETY CODE	SYS	SWITCH HEATER TRANSFORMER		
BIL	BASIC IMPULSE LEVEL	FUT	FUTURE	NEG	NEGATIVE				
BKR	BREAKER	G	GREEN	NIC	NOT IN CONTRACT	T	TOP		
BLDG	BUILDING	GALV	GALVANIZED	N.O.	NORMALLY OPEN	TB	TERMINAL BLOCK		
BM	BEAM	G/L	GROUND LINE	NOM	NOMINAL	TBD	TO BE DETERMINED		
BR	BRIDGE	GND	GROUND	NP	NAMEPLATE	TBR	TO BE REMOVED		
BRKT	BRACKET	GRS	GALVANIZED RIGID STEEL	NR	NOT REGISTERED	TBS	TIE-BREAKER STATION		
B, BTM	BOTTOM	GRX	GRADE CROSSING	NTS	NOT TO SCALE	TCR	THYRISTOR CONTROLLED RECTIFIER		
BTWN	BETWEEN	GTO	GATE-TURN-OFF THYRISTOR	NO	NUMBER	TELE.TEL	TELEPHONE		
C	CELCIUS OR CONDUIT	H	HEIGHT, HIGH	OB	OUTBOUND, OVERBROOK	TEMP	TEMPERATURE		
CAB	CABINET	HD	HARD DRAWN	OC	ON CENTER	TEM	TEMPORARY		
CATH	CATHODE	HH	HAND HOLE	OCC	OPERATIONS CONTROL CENTER	TERM	TERMINAL, TERMINATION		
CBD	CENTRAL BUSINESS DISTRICT	HEX	HEXAGONAL	DCS	OVERHEAD CATENARY SYSTEM, OVERHEAD CONTACT SYSTEM	T/F	TOP OF FOUNDATION		
CENC	CONCRETE ENCASED	HO	HAND OPERATED	OD	OUTSIDE DIAMETER	T/G	TOP OF GROUND LINES		
CBK	CIRCUIT BREAKER	HORIZ	HORIZONTAL	OL	OVERLOAD	T/LR	TOP OF LOW RAIL		
C/B	CIRCUIT BREAKER	HP	HORSEPOWER	OPER	OPERATOR	TMR	TIMER		
CHAM	CHAMFER	HRL	HIGH RAIL LEVEL	PAAC	PORT AUTHORITY OF ALLEGHENY COUNTY	TO	TURNOUT		
CHGR	CHARGER	HV	HIGH VOLTAGE	PH	PHASE	TOC	TOP OF CONCRETE		
CIC	COMMUNICATIONS INTERFACE CABINET	HS	HIGH STRENGTH	PORT	PORTABLE	TORW	TOP OF RETAINING WALL		
CIH	CENTRAL INSTRUMENT HOUSE	HSS	HIGH STRENGTH STEEL	P/T	POTENTIAL TRANSFORMER	TOR	TOP OF RAIL		
CKT	CIRCUIT	HVAC	HEATING, VENTILATING AND AIR CONDITIONING	PL	PLATE OR PILOT LIGHT	TP	TRACTION POWER		
C L	CENTERLINE	HZ	HERTZ	PLAT	PLATFORM	TPCT	TRACTION POWER CABLE TROUGH		
C TO C	CENTERLINE TO CENTERLINE	IB	IMPEDANCE BONDS, INBOUND	PLC	PROGRAMMABLE LOGIC CONTROLLER	TPH	TRACTION POWER HANDHOLE		
CLD	CLAD	ID	INSIDE DIAMETER	PNL	PANEL	TPN	TRACTION POWER MANHOLE		
CLF	CHAIN LINK FENCE	IEEE	INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS	POS	POSITIVE	TPP	TRACTION POWER NEGATIVE		
CNTL	CLEARANCE, CLEAR	IFTC	INTERFACE TERMINAL CABINET	PROP	PORTABLE	TPSS	TRACTION POWER POSITIVE		
CO	CONTROL	IJ	INSULATED JOINT	PT	POINT OF TANGENT, POTENTIAL TRANSFORMER	T/R	TOP OF RAIL		
COMM	COMPANY	INCL	INCLUDE, INCLUDING	PSF	POWER SUPPLY FEEDER	TDR	TRANSDUCER		
CONC	CONCRETE	INSUL	INSULATION	PVCC	POLYVINYL CHLORIDE CONDUIT (PVC)	TS	TRACK		
COND	CONDUCTOR	I/R, IR	IN RUNNING (RIDING CONTACT WIRE)	PVC	POLYVINYL CHLORIDE	TTC	TANGENT OF SPIRAL/TEST SWITCH		
1/C	SINGLE CONDUCTOR	IN	INCH, INCHES	PWR	POWER	TYP	TELEPHONE TERMINAL CABINET		
CONST	CONSTRUCTION	ISC	SHORT CIRCUIT CURRENT	QTY	QUANTITY		TYPICAL		
CONT	CONTINUATION, CONTINUOUS	J	JUMPER						
CONTR	CONTRACTOR	JB	JUNCTION BOX						
CND	CONDUIT	JCT	JUNCTION						
CPT	CONTROL POWER TRANSFORMER								
CR	CONDUIT RISER								
CT	CURRENT TRANSFORMER								
CS	CURVE-TO-SPIRAL								
CSHH	COMMUNICATION / SINGLE HANDHOLD								
CSMH	COMMUNICATION / SINGLE MANHOLE								
CTR	CENTER								
CU	COPPER								

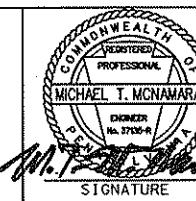
 <p>Gannett Fleming Transit &amp; Rail Systems</p>	NO. DATE	DESCRIPTION	REVISIONS		DMJM HARRIS   AECOM	DESIGNED H SOROKIN DRAWN HT TRAN	<b>PORT AUTHORITY OF ALLEGHENY COUNTY</b> <small>PITTSBURGH PENNSYLVANIA</small>			
							NORTH SHORE CONNECTOR NSC TRAIN SYSTEM (SYSTEM-WIDE) STANDARD ABBREVIATIONS TRACTION POWER			
					APPROVED <i>David P. Henry 4/28/08</i>	DATE <i>4/28/08</i>	SCALE NTS	<b>Port Authority</b> <small>Engineering Services</small>	CONTRACT NO. <small>NSC-009</small>	
									DWG. NO. <small>GN204</small>	SHT. <small>17</small>

## SIGNAL ABBREVIATIONS

ACK	ACKNOWLEDGE	NWZ	NORMAL SWITCH REQUEST	TPO	TRACK POWER OFF
AR	APPROACH RELAY	NV	NON-VITAL	TPS	TRACK REPEATER STICK
AS	APPROACH STICK	O	OVERLOAD COIL	TR	TRACK RELAY
AT	APPROACH TRACK	OR	RELAY END OF OVERLAY TRACK CIRCUIT	TWC	TRAIN TO WAYSIDE
BP	BLOCK REPEATER	OT	OVERLAY TRACK	VS	TRAIN STOP CONTROL
B12GD	12V DC GROUND DETECTOR	P	REPEATER	VCOR	VITAL CUT OFF RELAY
BFP	BLOWN FUSE REPEATER	PB	PUSH BOTTOM		
B12	+DC ENERGY, 12 VOLTS	PBS	PUSHBUTTON STICK		
BX	+AC ENERGY	POS	AC POWER OFF STICK		<u>ROUTE AND ASPECT CHART ABBREVIATIONS</u>
BX12GD	120V AC GROUND DETECTOR	R	RELAY OR REVERSE OR RED		
CO	CALL ON	B12PO	DC POWER OFF	G/R	GREEN OVER RED ASPECT
COZ	CALL ON REQUEST	RC	ROUTE CHECK	Y/R	YELLOW OVER RED ASPECT
EO	FLASHER	REM	REMOTE CONTROL	Y/R/LW	YELLOW OVER RED OVER LUNAR WHITE ASPECT
E	INDICATION LAMP OR EAST	RR	ROUTE REQUEST	FG/R	FLASHING GREEN OVER RED ASPECT
F	TRAFFIC	RW	REVERSE SWITCH CONTROL	FY/R	FLASHING YELLOW OVER RED ASPECT
FIRE	FIRE ALARM	RWC	REVERSE SWITCH CORRESPONDENCE	FY/R/LW	FLASHING YELLOW OVER RED OVER LUNAR WHITE ASPECT
H	SIGNAL CONTROL (CAUTION/YELLOW)	RWP	REVERSE SWITCH REPEATER	FR/R	FLASHING RED OVER RED ASPECT
INT	INTRUSION ALARM	RLP	REVERSE LEVER REPEATER	Y	YELLOW ASPECT
LCL	LOCAL CONTROL	RWZ	REVERSE SWITCH REQUEST	Y/LW	YELLOW OVER LUNAR WHITE ASPECT
L	LOCK SWITCH	RWCK	REVERSE SWITCH INDICATOR	FY	FLASHING YELLOW
N	NORTHBOUND OR NORMAL OR -VE DC ENERGY	S	SOUTHBOUND OR STICK	R or R/R	RED ASPECT
NX	-VE AC ENERGY OR ENTRANCE EXIT	SS	SOUTHBOUND ROUTE STICK	N	NORTH
NS	NORTHBOUND ROUTE STICK	SMK	SNOW MELTER INDICATION	S	SOUTH
NW	NORMAL SWITCH CONTROL	SMS	SNOW MELTER CONTROL STICK	T	TRACK
NWC	NORMAL SWITCH CORRESPONDENCE	T	TRACK CIRCUIT FEED	GT	GRADE TIMER
NLP	NORMAL LEVER REPEATER	TRK	TRACK	ST	STATION TIMER
NWCK	NORMAL SWITCH INDICATOR	TE	TIME ELEMENT	LW	LUNAR WHITE
NWP	NORMAL SWITCH REPEATER	TP	TRACK REPEATER		



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

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

**PORT AUTHORITY OF ALLEGHENY COUNTY**  
 PITTSBURGH PENNSYLVANIA

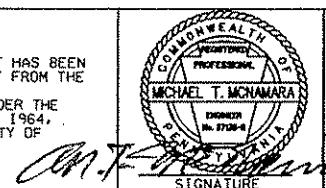
**NORTH SHORE CONNECTOR  
 NSC TRAIN SYSTEM (SYSTEM-WIDE)  
 STANDARD ABBREVIATIONS  
 SIGNALS**

COMMUNICATIONS ABBREVIATIONS

AGA	ABOVE GROUND ANTENNA	HVAC	HEATING, VENTILATING AND AIR CONDITIONING	S	SECONDARY
ADSS	ALL DIELECTRIC SELF SUPPORTING	HUMID	HUMIDITY	SHT NO	SHEET NUMBER
AC	ALTERNATING CURRENT			SHP	SHOP
ADA	AMERICANS WITH DISABILITIES ACT			SL	START LIGHT
AWG	AMERICAN WIRE GAUGE	GALV	GALVANIZED	SHV	SOUTH HILLS VILLAGE
A	AMP	GRS	GALVANIZED RIGID STEEL	SC	SPICE CABINET
AH	AMPERE-HOUR	GRD	GROUND	STO	STANDARD
ALC	AUTOMATIC LEVEL CONTROL	IO	IDENTIFICATION	SWR	STANDING WAVE RATIO
AUX	AUXILIARY	INBNO	INBOUND	STA, STN	STATION
AVE	AVENUE	I/O	INPUT/OUTPUT	ST	STREET
BATT	BATTERY	JCT	JUNCTION	SUBSTN, SS	SUBSTATION
BGA	BELLOW GROUND BREAKER	JB	JUNCTION BOX	SACS	SUBSTATION ALARM AND CONTROL SYSTEM
BKR	BREAKER				
CAB	CABINET	KBPS	KILO BITS PER SECOND	SCADA	SUPERVISORY CONTROL AND DATA ACQUISITION
CBL	CABLE	KM	KILOMETER	SONET	SYNCHRONOUS OPTICAL NETWORK
CXR	CARRIER	KVA	KILO VOLT-AMPERE	SYS	SYSTEM
CTS	CARRIER TRANSMISSION SYSTEM	KVM	KEYBOARD/VIDEO/MONITOR		
CBD	CENTRAL BUSINESS DISTRICT	LTG	LIGHTING	T	TELEPHONE
CTC	CENTRALIZED TRAIN CONTROL	LRV	LIGHT RAIL VEHICLE	TEMP	TEMPERATURE
CHAN	CHANNEL	LRT	LIGHT RAIL TRANSIT	TEL	TELEPHONE INSTRUMENT
CB	CHANNEL BANK	LAN	LOCAL AREA NETWORK	TTC	TELEPHONE TERMINAL CABINET
CKT	CIRCUIT	MOF	MAIN DISTRIBUTION FRAME	TB	TERMINAL BLOCK
CCTV	CLOSED CIRCUIT TELEVISION	MOW	MAINTENANCE OF WAY	TIP	TERMINATE IN PANEL
COL	COLLECTION	MFR	MANUFACTURER	THRU	THROUGH
C	CONDUIT	MAX	MAXIMUM	TVM	TICKET VENDING MACHINE
CAO	COMPUTER AIDED DISPATCHING	MBPS	MEGA BITS PER SECOND	TRK	TRACK
CES	COMMUNICATIONS EQUIPMENT SHELTER	MIC	MICROPHONE	TTW	TRAIN TO WAYSIDE COMMUNICATIONS
CR	COMMUNICATIONS ROOM	MT	MOUNT	TCVR	TRAIN TO WAYSIDE
CS	COMMUNICATIONS SHELTER	MTO	MONTEO	TX	TRANSCIEVER
CSPS	COMMUNICATIONS SYSTEM POWER SUPPLY	MUX	MULTIPLEX SHELF	TO	TRANSMIT
CC	CONTROL CENTER	NEC	NATIONAL ELECTRIC CODE	TRANS	TRANSPORTATION
CU	COPPER	NMS	NETWORK MANAGEMENT SYSTEM	TWP	TWISTED WIRE PAIR
		NOM	NOMINAL	2W	TWO WIRE
		NIC	NOT IN CONTRACT	TYP	TYPICAL
		NTS	NOT TO SCALE		
OIA	DIAMETER			UPS	UNINTERRUPTIBLE POWER SUPPLY
DACS	DIGITAL ACCESS AND CROSSCONNECT SYSTEM	OPS	OPERATIONS		
DOS	DIGITAL DATA SERVER	OCC	OPERATIONS CONTROL CENTER		
DSX		DC - 1	OPTICAL CARRIER RATE 1 (51 MBPS)	VMS	VARIABLE MESSAGE SIGN
DS - 0	DIGITAL SIGNAL RATE 0 (64 Kbps)	OC - 3	OPTICAL CARRIER RATE 3 (155 MBPS)	VMS/PA	VARIABLE MESSAGE SIGN/PUBLIC ADDRESS
DS - 1	DIGITAL SIGNAL RATE 1 (1.544 Mbps)	OW	ORDER WIRE	VCR	VIDEO CASSETTE RECORDER
DSL	DIGITAL SUBSCRIBER LINE	OUTBND	OUTBOUND	VCS	VOICE COMMUNICATIONS SYSTEM
DIM	DIMENSION	OVB	OVERBROOK	VF	VOICE FREQUENCY
DC	DIRECT CURRENT	OCS	OVERHEAD CONTACT SYSTEM	V	VOLT
DWG	DRAWING	PR	PAIR	VAC	VOLTS ALTERNATING CURRENT
DTMF	DUAL TONE MULTI FREQUENCY	PNL	PANEL	VOC	VOLTS DIRECT CURRENT
E & M	E-LEAD AND M-LEAD	PTZ	PAN, TILT AND ZOOM		
EA	EACH	PTE	PATCH TO EQUIPMENT	W	WATT
EMER	EMERGENCY	PITT	PITTSBURGH	W/	WITH
EMS	EMERGENCY MEDICAL SERVICES	PAAC	PORT AUTHORITY OF ALLEGHENY COUNTY		
ETC	ETCETERA	PWR	POWER		
EQUIP	EQUIPMENT	P	PRIMARY		
FR	FAN ROOM	PRS	PRIMARY REFERENCE SOURCE		
FLU	FAULT LOCATING UNIT	PBX	PRIVATE BRANCH EXCHANGE		
FOF	FIBER DISTRIBUTION FRAME	PA	PUBLIC ADDRESS		
FOP	FIBER DISTRIBUTION PANEL	PA/SYS	PUBLIC ADDRESS SYSTEM		
FRE	FIBERGLASS EPOXY CONDUIT	PCM	PULSE CODE MODULATION		
FO	FIBER OPTIC	RU	RACK UNIT		
FSE	FIBER SLACK ENCLOSURE	RF	RAADIO FREQUENCY		
FTG	FITTING	RFL	RAADIO FREQUENCY LABS		
FL FLR	FLOOR	RX	RECEIVE		
FXD	FOREIGN EXCHANGE OFFICE	RH	RELAY HOUSE		
FXS	FOREIGN EXCHANGE SUBSCRIBER	RICS	REMOTE INDICATION AND CONTROL SYSTEM		
4W	FOUR WIRE	RTU	REMOTE TERMINAL UNIT		
		RD TEL	RINGDOWN TELEPHONE		
		RM	ROOM		

 Gannett Fleming  
Transit & Rail Systems

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DMJM HARRIS | AECOM  
FOUR GATEWAY CENTER  
20TH FLOOR  
PITTSBURGH, PA. 15222  
EXHIBIT NO. 0700-4  
SIGNATURE

APPROVED DATE

**PORT AUTHORITY OF ALLEGHENY COUNTY**  
PITTSBURGH, PENNSYLVANIA

NORTH SHORE CONNECTOR  
NSC TRAIN SYSTEM (SYSTEM-WIDE)  
STANDARD ABBREVIATIONS  
COMMUNICATIONS

Port Authority

CONTRACT NO. NSC-009  
DWG. NO. GN206 SHT. 19

NO.	DATE	DESCRIPTION	REVISIONS

COMMUNICATION CABLE NAMING CONVENTION ABBREVIATIONS

CABLE TYPES:

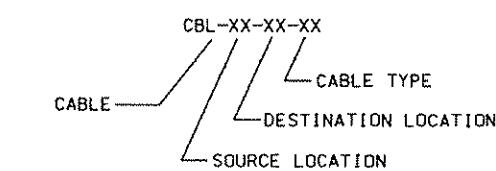
CXR	CARRIER
CCTV	CLOSED CIRCUIT TELEVISION
CU	COPPER
FO	FIBER OPTIC
LSZH	LOW SMOKE ZERO HALOGEN
ADSS	ALL DIELECTRIC SELF-SUPPORTING

LOCATIONS:

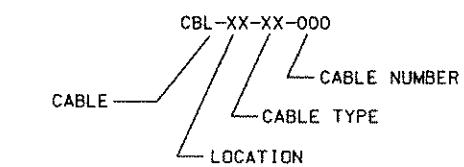
AL	ALLEGHENY
BO	BOGGS
BA	BON AIR
CC	CONVENTION CENTER
CS	CASTLE SHANNON
CSJ	CASTLE SHANNON JUNCTION
DJ	DORMONT JUNCTION
DE	DENISE
FA	FIRST AVENUE
FF	FALLOWFIELD
GC	GATEWAY CENTER
GL	GLENBURY
KI	KILLARNEY
LI	LIBRARY
MN	MCNEILLY
MH	MEMORIAL HALL
ME	MESTA
ML	MOUNT LEBANON
MWNP	MOUNT WASHINGTON NORTH PORTAL
NA	NEELD AVENUE
NS	NORTH SHORE
OCC	OPERATIONS CONTROL CENTER
PP	PENN PARK
PI	PINE
PT	PITT TOWER
PO	POTOMAC
SB	SOUTH BANK
SHV	SOUTH HILLS VILLAGE
SHJ	SOUTH HILLS JUNCTION
SOPK	SOUTH PARK
SS	STATION SQUARE
SP	STEEL PLAZA
WI	WILLOW
WJ	WASHINGTON JUNCTION
WL	WEST LIBRARY
WS	WOOD STREET

CABLE NAMING CONVENTION

CABLES BETWEEN EQUIPMENT ROOMS:



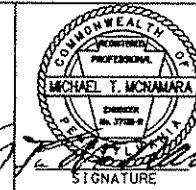
CABLES FROM MDF TO EQUIPMENT:



 Gannett Fleming  
Transit & Rail Systems

NO.	DATE	DESCRIPTION
REVISIONS		

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SIGNATURE

APPROVED

DATE

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

**PORT AUTHORITY OF ALLEGHENY COUNTY**  
PITTSBURGH  
NORTH SHORE CONNECTOR  
NSC TRAIN SYSTEM (SYSTEM-WIDE)  
STANDARD ABBREVIATIONS  
COMMUNICATION CABLE NAMING CONVENTION

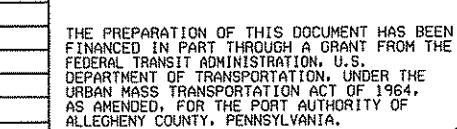
<b>Port Authority</b>	CONTRACT NO. NSC-009
Gannett Fleming	DWO. NO. GN207

SHT. 20



## CIVIL SYMBOLS

NOTE:  
FOR THE SIZE OF SEWER, WATER AND GAS LINES SHOWN ON DRAWING  
ARE FOR REFERENCE ONLY. NUMBERS SHOWN FOR MANHOLES, PULL  
BOXES AND JUNCTION BOXES ARE FOR REFERENCE ONLY.



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<p>COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ENGINEERS</p> <p>MICHAEL T. MCNAMARA REGISTRATION NO. 37744 EXPIRED APRIL 2004</p> <p><i>M.T. McNamara</i></p> <p>SIGNATURE</p>	<p>DMJM HARRIS   AECC</p> <p>FOUR GATEWAY CENTER 20TH FLOOR PITTSBURGH, PA. 15222</p> <p><i>Daniel F. Harris 4/28/04</i></p> <p>APPROVED</p> <p>DATE</p>
---	--

<b>PITTSBURGH</b> <b>PENNSYLVANIA</b>	
<b>NORTH SHORE CONNECTOR</b> <b>NSC TRAIN SYSTEM (SYSTEM-WIDE)</b> <b>STANDARD SYMBOLOGY</b> <b>SHEET 1 OF 15</b>	
<b>Port Authority</b> <small>connecting people to opportunity</small>	<b>CONTRACT NO.</b> <b>NSC-009</b>
	<b>DWG. NO.</b> <b>GN300</b>

# ROADWAY AND WALKWAY LIGHTING

<u>EXISTING</u>	<u>NEW</u>
WALL	WALL (RETAINING)
	WALL
DITCHES	
WALL WITH PAVED DITCH OR GUTTER	WALL
WALL	
GUIDE RAIL	T T T T T
FENCE	X X X
LABEL	EDGE OF PAVEMENT
LABEL	SHOULDER LINE
DEPRESSED CURB	DEPRESSED CURB
CURB LINE	TYPE OF CURB
I OR □ OR CAT	CATENARY POLE
TEMPORARY BARRIER	
BILLBOARD	SINGLE FACE, BILLBOARD
BILLBOARD	DOUBLE FACE, BILLBOARD
LABEL	FOUNDATION, OLD RUINS

<u>EXISTING</u>	<u>NEW</u>	<u>EXISTING</u>	<u>NEW</u>
		BUILDINGS	
LABEL		LABEL	
CONTOUR LINE		SPOT ELEVATION	
840		840.2'	
840.2' X		SWALE	
S		S	
CUT SLOPE		FILL SLOPE	
		SURFACE FLOW DIRECTION	
		TEMPORARY CONSTRUCTION EASEMENT	
		LABEL	
		REQUIRED LIMIT OF SLOPE LINE	
		LABEL	
		WOODED AREA	
		INDIVIDUAL TREES OR SHRUBS	
		LABEL	
		RIVER, CREEK, OR STREAM	
		DRAINAGE DRAW, DITCHES, OR RAVINES, NORMALLY DRY	
		WET LAND	
		OR	

 <b>Gannett Fleming</b> Transit & Rail Systems	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>	 <b>DMJM HARRIS   AECOM</b> FOUR GATEWAY CENTER 20TH FLOOR PITTSBURGH, PA. 15222 <i>[Signature]</i> APPROVED DATE	DESIGNED	J.C. TRAUM	<b>PORT AUTHORITY OF ALLEGHENY COUNTY</b> PITTSBURGH NORTH SHORE CONNECTOR NSC TRAIN SYSTEM (SYSTEM-WIDE) STANDARD SYMBOLS SHEET 2 OF 15
						DRAWN	J.C. TRAUM		
						CHECKED	TA SHANTZ		
						IN CHARGE	CD JONES		
						DATE	APR. 28, 2008		
						SCALE	NTS		
								<b>Port Authority</b> CONTRACT NO. NSC-009 DWG. NO. GN301 SHT. 23	

## CIVIL SYMBOLS

EXISTING	NEW
RAILING OR HANDRAIL	RAILING OR HANDRAIL
ROCK LINING	ROCK LINING
ROCK BASIN	ROCK BASIN
TEMPORARY SLOPE PIPE DRAIN	TEMPORARY SLOPE PIPE DRAIN
PAVED ENERGY DISSIPATOR	PAVED ENERGY DISSIPATOR
ROCK BARRIER	ROCK BARRIER
DIKE	DIKE
SEDIMENTATION POND - TYPE 2	SEDIMENTATION POND - TYPE 2
SEDIMENTATION POND - TYPE 1	SEDIMENTATION POND - TYPE 1
STANDBOX	STANDBOX
ROCK ENERGY DISSIPATOR	ROCK ENERGY DISSIPATOR
WATER COURSE EROSION PROTECTION MATTING	WATER COURSE EROSION PROTECTION MATTING
TEMPORARY DITCH	TEMPORARY DITCH
SILT BARRIER FENCE	SILT BARRIER FENCE
TEST BORING	TEST BORING
EXPLORATORY GROUT HOLES	EXPLORATORY GROUT HOLES

## ARCHITECTURAL SYMBOLS

ROCK	IRON OR STEEL
EARTH	ALUMINUM
GRANULAR MATERIAL	BRICK
CEMENT / SAND / MORTAR	CONSTRUCT NEW BRICK WALL (ELEVATION)
CONCRETE - PRECAST AND POURED IN PLACE	NEW EXTERIOR METAL PANEL (ELEVATION)
MASONRY UNIT	GYPSUM WALL BOARD
FINISHED WOOD	PLASTIC
ROUGH WOOD	Glass
WOOD BLOCKING	Glass (Elevation)
PYLWOOD	PARTITION INDICATION WOOD STUD
BATT INSULATION	PARTITION INDICATION METAL STUD
INSULATION RIGID BATT / LOOSE FILL	STRUCTURAL MEMBERS PLAN AND SECTIONS
INSULATION SPRAY / FOAM	STRUCTURAL MEMBERS LARGE SECTIONS AND DETAILS

 <b>Gannett Fleming</b> 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>COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ENGINEER MICHAEL T. MCNAMARA LICENSE NO. 17328-R</p> <p>SIGNATURE</p> <p>Daniel P. Henry 4/28/08</p>	<p>DMJM HARRIS   AECOM</p> <p>FOUR GATEWAY CENTER 20TH FLOOR PITTSBURGH, PA. 15222</p> <p>CHECKED TA SHANTZ IN CHARGE CD JONES DATE APR. 28, 2008</p> <p>APPROVED DATE</p>	<p>DESIGNED JC TRAUM DRAWN JC TRAUM</p> <p>SCALE NTS</p>	<p><b>PORT AUTHORITY OF ALLEGHENY COUNTY</b> Pittsburgh</p> <p>NORTH SHORE CONNECTOR NSC TRAIN SYSTEM (SYSTEM-WIDE) STANDARD SYMBOLS SHEET 3 OF 15</p>	
							<p>Port Authority</p> <p>CONTRACT NO. NSC-009 DWG. NO. GN302 SHT. 24</p>	

## ARCHITECTURAL SYMBOLS CONTINUED

DENOTES NEW  
DENOES EXISTING  
BUILDING CENTER LINE

EXISTING BUILDING WALLS,  
FLOORS, ETC. (USE A  
LIGHT LINE OR SHADED  
LINE)

DEMOLISHED BUILDING WALLS,  
ETC.

NEW BUILDING WALLS

PARTITION TYPE

DEMOLITION KEYED  
NOTE INDICATOR

KEYED NOTE  
INDICATOR

00  
00  
BUILDING COLUMN  
DESIGNATION

## GENERAL ANNOTATION SYMBOLS

SECTION DESIGNATOR  
DWG. NO. ON WHICH SECT. APPEARS

SYMBOL

SECTION SECTION DESIGNATOR  
DWG. NO. ON WHICH THE SECTION SYMBOL IS FIRST SHOWN

TITLE

DETAIL NO.  
DWG. NO. ON WHICH DETAIL APPEARS

SYMBOL

DETAIL DETAIL NUMBER  
DWG. NO. ON WHICH THE DETAIL SYMBOL IS FIRST SHOWN

TITLE

ELEVATION DESIGNATOR  
DWG. NO. ON WHICH ELEVATION APPEARS

SYMBOL

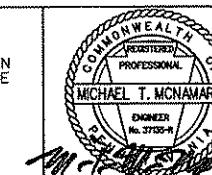
ELEVATION ELEVATION DESIGNATOR  
DWG. NO. ON WHICH THE ELEVATION SYMBOL IS FIRST SHOWN

TITLE

ELEVATION

Gannett Fleming  
Transit & Rail Systems

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DMJM HARRIS | AECOM  
FOUR GATEWAY CENTER  
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CHECKED TA SHANTZ  
IN CHARGE CD JONES  
DATE APR. 28, 2008  
SIGNATURE *David P. Heny 4/28/08*  
APPROVED DATE  
SCALE NTS

PORT AUTHORITY OF ALLEGHENY COUNTY  
PITTSBURGH  
PENNSYLVANIA

NORTH SHORE CONNECTOR  
NSC TRAIN SYSTEM (SYSTEM-WIDE)  
STANDARD SYMBOLS  
SHEET 4 OF 15

Port Authority

CONTRACT NO. NSC-009  
DWG. NO. GN303 SHT. 25

NO.	DATE	DESCRIPTION	REVISIONS

## FIRE PROTECTION SYMBOLS

EXISTING	NEW	EXISTING	NEW	EXISTING	NEW	EXISTING	NEW	BASIC SYMBOL SHAPES AND RELATIVE SIZES
SIGNAL INITIATING DEVICES		EMERGENCY ILLUMINATION SYMBOLS		EXTINNUISHING SYSTEM SYMBOLS		PORTABLE FIRE EXTINGUISHER SYMBOLS		
MANUAL STATIONS (CALL POINT)	□	EMERGENCY LIGHT, BATTERY POWERED, ONE LAMP	□	WATER BASED SYSTEM		△ WATER EXTINGUISHER	△	GENERAL REFERENCE
MANUAL ALARM BOX (PULL STATION AND PULL BOX)	■	EMERGENCY LIGHT, BATTERY POWERED, TWO LAMPS	□	(A) AUTOMATICALLY ACTUATED	●	▲ FOAM EXTINGUISHER	▲	MAJOR ELEMENTS
TELEPHONE STATION (TELEPHONE CALL POINT)	■	EMERGENCY LIGHT, BATTERY POWERED, THREE LAMPS	□	(B) MANUALLY ACTUATED	■	△ DRY CHEMICAL EXTINGUISHER'S FOR FIRES OF LIQUID, GAS, ELECTRICAL TYPES	○	AUTOMATICALLY ACTUATING SYSTEM 5/32" (4mm) DIA.
AUTOMATIC DETECTION AND SUPERVISORY DEVICES	○	CONTROL AND SUPERVISORY DEVICES		DRY SYSTEM		▲ FOR FIRES OF ALL TYPES, EXCEPT METALS	□	MANUALLY ACTUATING SYSTEMS 5/32" (4mm) SQUARE
HEAT DETECTOR (THERMAL DETECTOR)	◊	CONTROL PANEL	□	(A) AUTOMATICALLY ACTUATED	○	▲ CO <sub>2</sub> EXTINGUISHER'S	△	PORTABLE FIRE EXTINGUISHER 3/16" (4.5mm) SIDES
SMOKE DETECTOR	◎	DOOR HOLDER	○	(B) MANUALLY ACTUATED	□	FIRE FIGHTING EQUIPMENT SYMBOLS		FIRE FIGHTING EQUIPMENT 1/4" (6mm) SIDES
SMOKE DETECTOR IN DUCT	□	SPRINKLERS		FOAM SYSTEM		○ GENERAL SYMBOL	○	SUPPLEMENTARY ELEMENTS
GAS DETECTOR	●	SPRINKLER, GENERAL	○	(A) AUTOMATICALLY ACTUATED	●	▲ CO <sub>2</sub> REEL STATION	▲	WATER SYSTEM COMPONENTS 3/32" (2mm) DIA.
FLAME DETECTOR (FLICKER DETECTOR)	●	UPRIGHT SPRINKLER	○	(B) MANUALLY ACTUATED	■	▲ DRY CHEMICAL REEL STATION	○	FOAM AGENT 3/16" (4.5mm) DIA.
FLOW DETECTOR SWITCH	◊	PENDENT SPRINKLER	○	DRY CHEMICAL SYSTEM FOR LIQUID, GAS AND ELECTRICAL TYPE FIRES		▲ FOAM REEL STATION	△	DRY CHEMICAL AGENT 3/32" (2mm) SQUARE
PRESSURE DETECTOR/ SWITCH	◊	UPRIGHT SPRINKLER, NIPPLED UP	○	(A) AUTOMATICALLY ACTUATED	○	▲ HOSE STATION DRY STANDPIPE	▲	GASEOUS AGENT 1/8" (3mm) SIDES
LEVEL DETECTOR/SWITCH	○	PENDENT SPRINKLER, ON DROP NIPPLE	●	(B) MANUALLY ACTUATED	□	▲ HOSE STATION CHARGED STANDPIPE	▲	NOZZLE
TAMPER DETECTOR/SWITCH	○	SPRINKLER, WITH GUARD	⊗	FOR FIRES OF ALL TYPES (EXCEPT METALS)		▲ MONITOR NOZZLE, DRY	○	PRESSURE NOTATION
VALVE WITH TAMPER DETECTOR/SWITCH	⊗	SIDEWALL SPRINKLER	▽	(A) AUTOMATICALLY ACTUATED	●	▲ MONITOR NOZZLE, CHARGED	▲	SWITCH (ELECTRICAL) OR CONTACT 3/32" (2mm) DIA.
ALERTING DEVICES AUDIBLE TYPE (SOUNDER)		OUTSIDE SPRINKLER	▽	(B) MANUALLY ACTUATED	■			VALVE 5/32" (4mm) HIGH
SPEAKER/HORN (ELECTRIC HORN)	□	SPECIAL SPRAY NOZZLE	↑	SYSTEMS UTILIZING A GASEOUS MEDIUM CARBON DIOXIDE SYSTEM				CHECK VALVE 1/4" HIGH (6mm) (WITH ARROW)
		PIPING, VALVES, CONTROL DEVICES		(A) AUTOMATICALLY ACTUATED	●			TAMPER DETECTOR 5/32" (4mm) DIA.
BELL (GONG)	○	(INDICATE PIPE SIZE) SPRINKLER PIPING AND BRANCH LINE		(B) MANUALLY ACTUATED	□			HEAT DETECTOR 0.05" (1mm) DIA.
WATER MOTOR ALARM (WATER MOTOR GONG)	▲	⊗ SPRINKLER RISER	⊗					FLOW DETECTOR 5/32" (4mm) SQUARE
HORN WITH LIGHT (HORN WITH STROBE)	×	→ VALVE (GENERAL)	▷					
VISUAL TYPES		→ ANGLE VALVE (ANGLE HOSE VALVE)	▷					
LIGHT (LAMP, SIGNAL LIGHT, INDICATOR LAMP, STROBE)	×	→ CHECK VALVE (GENERAL)	▷					
ILLUMINATED EXIT SIGN	⊗	→ ALARM CHECK VALVE	▷					
ILLUMINATED EXIT SIGN WITH DIRECTION ARROW	⊗	→ DRY-PIPE VALVE	▷					
		→ DRY-PIPE VALVE WITH QUICK OPENING DEVICE- ACCELERATOR OR EXHAUSTER	▷					
		→ DELUGE VALVE	▷					



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

DESIGNED  
DRAWN  
CHECKED  
IN CHARGE  
DATE APR.  
SCALE

JC TRAUM  
JC TRAUM  
TA SHANTZ  
CD JONES  
28. 2008  
NTS

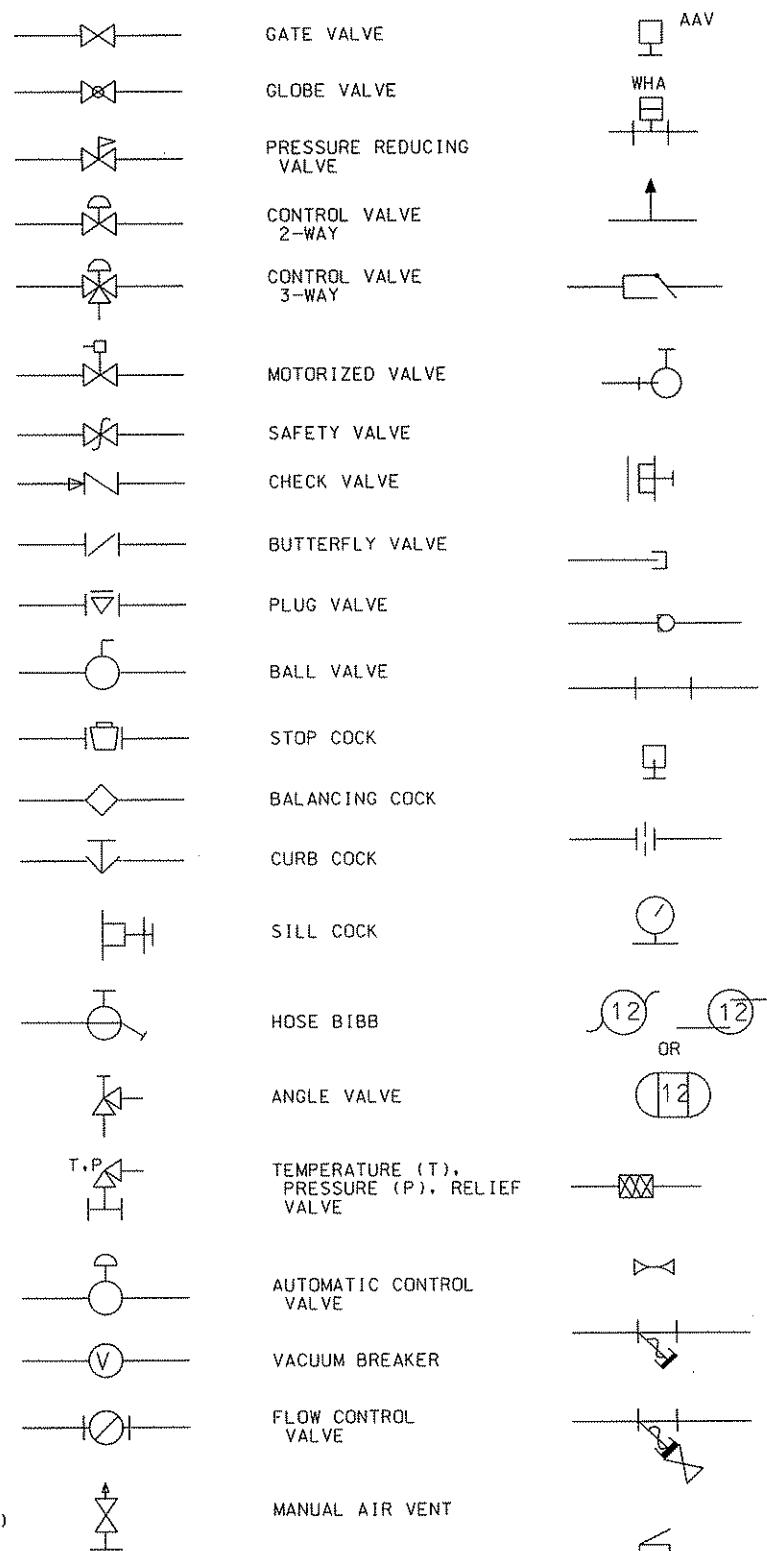
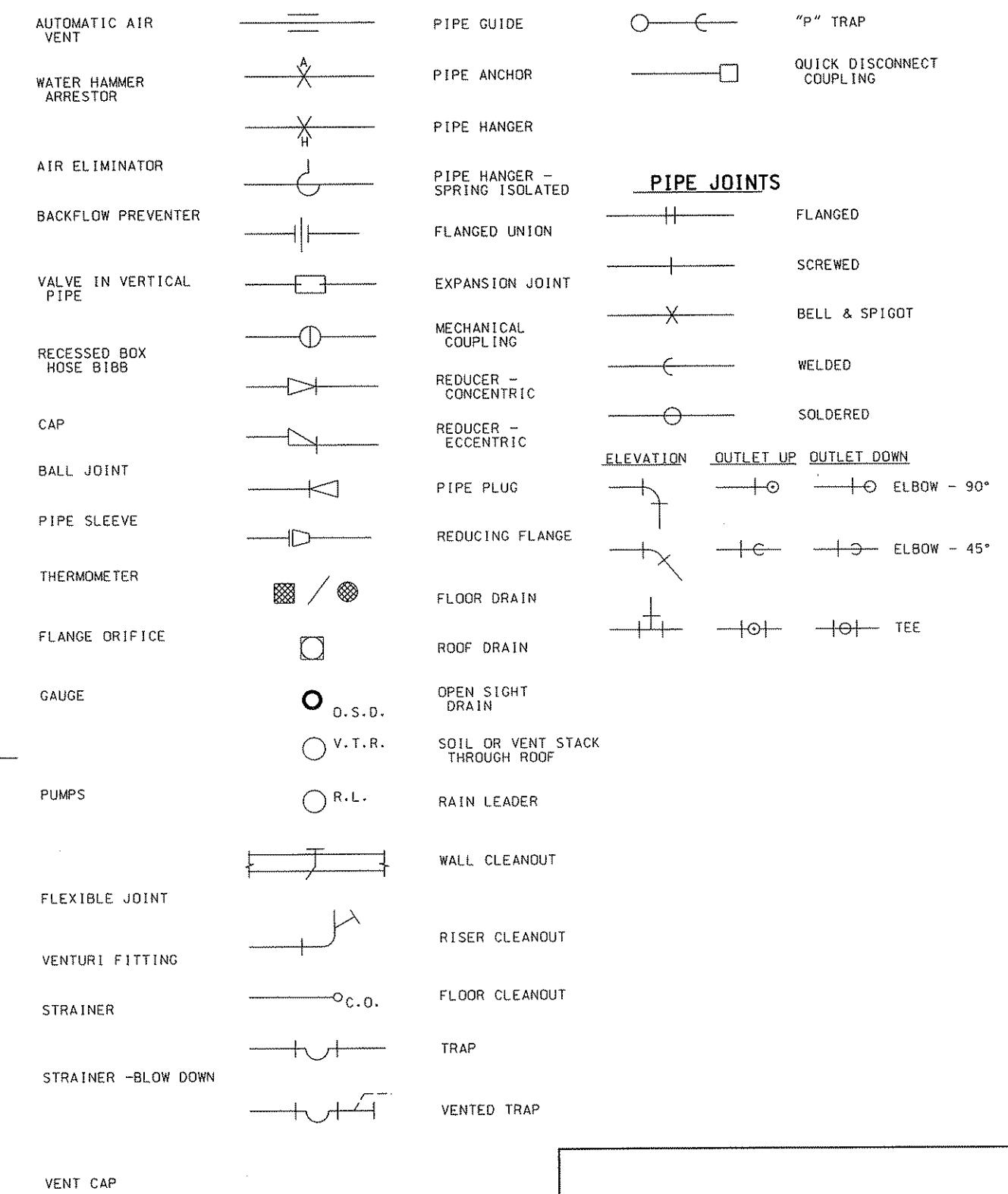
**PITTSBURGH**

**PENNSYLVANIA**

**NORTH SHORE CONNECTOR**  
**NSC TRAIN SYSTEM (SYSTEM-WIDE)**  
**STANDARD SYMBOLS**  
**SHEET 5 OF 15**

PIPING

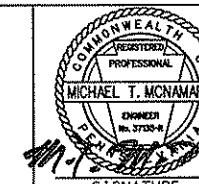
A	AIR
CA	COMPRESSED AIR
D	CONDENSATE DRAIN
F	FIRE LINE
SP	SPRINKLER LINE
LFD	LIQUID FUEL - DIESEL
LFG	LIQUID FUEL - GASOLINE
LP	LIQUEFIED PETROLEUM GAS
L	LUBE OIL
WO	WASTE OIL
FOS	FUEL OIL SUPPLY
FOR	FUEL OIL RETURN
ATF	AUTOMATIC TRANSMISSION FLUID
EO	ENGINE OIL
AF	ANTI-FREEZE
CG	CHASSIS GREASE
H	HYDRAULIC PIPING
G	GAS (NATURAL)
HWS	HEATING HOT WATER SUPPLY
HWR	HEATING HOT WATER RETURN
DCW	DOMESTIC COLD WATER
DHW	DOMESTIC HOT WATER
DHWR	DOMESTIC HOT WATER RETURN
(180)	HIGH TEMPERATURE DOMESTIC HOT WATER
RD	REFRIGERANT DISCHARGE
RL	REFRIGERANT LIQUID
RG	REFRIGERANT HOT GAS
RS	REFRIGERANT SUCTION
VAC	VACUUM
VAC-C	VACUUM CLEANER
VENT	VENT
SAN. S	SANITARY SOIL & WASTE (ABOVE FLOOR)
SAN. S	SANITARY SOIL & WASTE (BELOW FLOOR)
ST. OR SS	STORM DRAINAGE (ABOVE FLOOR)
ST. OR SS	STORM DRAINAGE (BELOW FLOOR)

VALVESFITTINGS AND SPECIALTIES

Gannett Fleming  
Transit & Rail Systems

NO.	DATE	DESCRIPTION
REVISIONS		

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DMJM HARRIS | AECOM  
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20TH FLOOR  
PITTSBURGH, PA. 15222  
MICHAEL T. MCNAMARA  
OWNER  
No. 37034  
SIGNATURE  
APPROVED  
DATE  
4/28/08

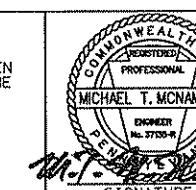
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DRAWN JC TRAUM  
CHECKED TA SHANTZ  
IN CHARGE CD JONES  
DATE APR. 28, 2008  
SCALE NTS

PORT AUTHORITY OF ALLEGHENY COUNTY  
Pittsburgh, Pennsylvania  
NORTH SHORE CONNECTOR  
NSC TRAIN SYSTEM (SYSTEM-WIDE)  
STANDARD SYMBOLS  
SHEET 6 OF 15  
Port Authority  
CONTRACT NO. NSC-009  
DWG. NO. GN305  
SHT. 27

## HVAC SYMBOLS

	DUCTWORK-INTERNAL INSULATED OR ACOUSTIC LINED		DUCT ACCESS/CLEAN OUT PANEL
	DUCTWORK-EXTERNALLY INSULATED		LINEAR DIFFUSER (LENGTH IN INCHES/CFM)
	RIGID BOARD INSULATION DUCTWORK		MIXING BOX
	DIRECTION OF FLOW		FLEX INSULATED DUCT
	DUCT PLAN (1st FIGURE, WIDTH; 2nd DEPTH) (CLEAR INSIDE DIMENSIONS)		SUPPLY AIR FLOW
	FIRE DAMPER		EXHAUST OR RETURN AIR FLOW
	DAMPER, MANUALLY OPERATED		AIR FLOW THROUGH DOOR LOUVER (DC) OR UNDERCUT DOOR (UC) DL, UC CFM
	DAMPER, GRAVITY OPERATED		SUPPLY DUCT SECTION (1st FIGURE WIDTH; 2nd DEPTH) (CLEAR INSIDE DIMENSIONS)
	DAMPER, MOTORIZED		EXHAUST DUCT SECTION (1st FIGURE WIDTH; 2nd DEPTH) (CLEAR INSIDE DIMENSIONS)
	DAMPER SPLITTER WITH ADJUSTING ROD		RECIRCULATION DUCT SECTION (1st FIGURE WIDTH; 2nd DEPTH) (CLEAR INSIDE DIMENSIONS)
	VOLUME DAMPER		FRESH AIR DUCT SECTION (1st FIGURE WIDTH; 2nd DEPTH) (CLEAR INSIDE DIMENSIONS)
	DAMPER, MOTORIZED VORTEX		LOUVER
	AIR SCOOP		AIR FILTER
	INCLINED RISE (IN RESPECT TO FLOW)		UNIT HEATER (PROPELLER) PLAN
	INCLINED DROP (IN RESPECT TO FLOW)		TUBEAXIAL OR VANEAXIAL FAN (BELT DRIVEN)
	FLEXIBLE DUCT AND EQUIPMENT CONNECTION		TUBEAXIAL OR VANEAXIAL FAN (DIRECT CONNECT)
	DUCT TRANSITION, RECTANGULAR TO ROUND		CENTRIFUGAL FAN
	DUCT TRANSITION, ANY VIEW		WALL MOUNTED EXHAUST FAN
	TURNING VANES		ROOF MOUNTED EXHAUST FAN
	SIZE CFM CEILING SUPPLY GRILL OR REGISTER		THERMOSTAT, ELECTRIC (E HEIGHT ABOVE FIN. FLOOR)
	SIZE CFM CEILING EXHAUST OR RETURN GRILLE		THERMOSTAT, PNEUMATIC (E HEIGHT ABOVE FIN. FLOOR)
	SIZE CFM CEILING DIFFUSE-(ROUND OR RECTANGULAR)		
	SIZE CFM WALL SUPPLY GRILLE		
	SIZE CFM WALL EXHAUST OR RETURN INLET		

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MICHAEL T. McNAMARA  
ENGINEER  
P.L.S., P.E.  
PITTSTON, PA.

APPROVED  
DATE  
4/28/08

JC TRAUM  
DRAWN  
JC TRAUM

TA SHANTZ  
IN CHARGE  
CD JONES

APR. 28, 2008

NTS

PORT AUTHORITY OF ALLEGHENY COUNTY  
Pittsburgh, Pennsylvania

NORTH SHORE CONNECTOR  
NSC TRAIN SYSTEM (SYSTEM-WIDE)  
STANDARD SYMBOLS  
SHEET 7 OF 15

Port Authority

CONTRACT NO. NSC-009  
DWG. NO. GN306 SHT. 28

Gannett Fleming  
Transit & Rail Systems

NO.	DATE	DESCRIPTION	REVISIONS

## ELECTRICAL SYMBOLS

	PAGING SYSTEM DEVICE (ANY TYPE)	\$.	SINGLE POLE TOGGLE SWITCH, 20 AMP. 120/227 VOLT, WITH COVER PLATE. 54" A.F.F. U.N.O.		RELEASED DOWN LIGHTING FIXTURE. SLASH INDICATES FIXTURE ON EMERGENCY SERVICE		FLUSH MOUNTED PANEL BOARD AND CABINET		25 KV CABLE TERMINATION
	WATCHMAN SYSTEM DEVICE	\$.	SINGLE POLE TOGGLE SWITCH, 20 AMP. 120/227 VOLT, WITH COVER PLATE. AND PILOT LIGHT. 54" A.F.F. U.N.O.		LIGHTING TRACK		SURFACE-MOUNTED PANEL BOARD AND CABINET		FUSED DISCONNECT SWITCH
	WALL MOUNTED SPEAKER	\$ <sub>2P</sub>	TWO POLE TOGGLE SWITCH, 20 AMP. 120/227 VOLT, WITH COVER PLATE. 54" A.F.F. U.N.O.		EXIT SIGN BOX, WITH DIRECTIONAL ARROWS AS INDICATED.		LIGHTING PANEL		MANUALLY OPERATED DISCONNECT SWITCH
	CEILING MOUNTED SPEAKER	\$ <sub>3</sub>	THREE WAY TOGGLE SWITCH, 20 AMP. 120/227 VOLT, WITH COVER PLATE. 54" A.F.F. U.N.O.		OUTDOOR POLE MOUNTED FIXTURE		POWER PANEL		FUSE
	FIRE ALARM PULL STATION	\$ <sub>4</sub>	FOUR WAY TOGGLE SWITCH, 20 AMP. 120/227 VOLT, WITH COVER PLATE. 54" A.F.F. U.N.O.		JUNCTION BOX		TROLLEY DUCT		TRANSFORMER
	FIRE ALARM PULL STATION WITH HORN	\$ <sub>01S</sub>	DISCONNECT SWITCH (TOGGLE TYPE) 54" A.F.F. U.N.O.		MULTIPLE FLOODLIGHT ASSEMBLY		BUSWAY (SERVICE, FEEDER OR PLUG-IN)		GROUND SENSOR C.T.
	FIRE ALARM CONTROL PANEL	\$ <sub>EXP</sub>	EXPLOSION PROOF SINGLE SWITCH, 20 AMPERE, 120 VOLTS 54" A.F.F. U.N.O.		EMERGENCY BATTERY PACK WITH CHARGER AND SEALED BEAM HEADS		CABLE THROUGH LADDER OR CHANNEL		INDICATES CKT NO.
	SIGNAL CENTRAL SYSTEM	\$	SINGLE RECEPTACLES, 20A, 120 VAC. 3 WIRE, GROUNDING TYPE, MOUNTED 18" A.F.F. U.N.O.		REMOTE EMERGENCY SEALED BEAM HEAD WITH OUTLET BOX		WIRE WAY		AC CIRCUIT BREAKER RATED 1500V AND BELOW
	CARD READER		DUPLEX RECEPTACLE, 20 AMPERE, 120 VOLT, 2 POLE, 3 WIRE GROUNDING TYPE, NEMA 5-15R, MOUNTED 18" A.F.F. U.N.O.		BRACKET OUTLET		WIRING, CONCEALED IN CEILING OR WALL		SOLID STATE TRIP DEVICE
	PUSH BUTTON		DUPLEX RECEPTACLE, AS SPECIFIED, EXCEPT WITH A WEATHERPROOF COVER PLATE.		LAY-IN FLUORESCENT FIXTURE, SLASH INDICATES FIXTURE ON EMERGENCY SERVICE		WIRING EXPOSED		POTENTIAL TRANSFORMER
	BUZZER	<sup>WP</sup>	DUPLEX RECEPTACLE, 20 AMPERE, 120 VOLT, 2 POLE, 3 WIRE GROUNDING TYPE, NEMA 5-15R, MOUNTED 6'-6 A.F.F. U.N.O.		FLUORESCENT LIGHTING STRIP FIXTURE SURFACE MOUNTED		HOME RUN TO PANEL BOARD INDICATE NUMBER OF CIRCUITS BY NUMBER OF ARROWS. ANY CIRCUIT WITHOUT SUCH DESIGNATION INDICATES A TWO-WIRE CIRCUIT. FOR A GREATER NUMBER OF WIRES INDICATE AS FOLLOWS: / (3 WIRES) // (4 WIRES), ETC.		CURRENT TRANSFORMER
	BELL		QUADRUPLEX RECEPTACLE, 20 AMPERE, 120 VOLT, 2 POLE, 3 WIRE GROUNDING TYPE, NEMA 5-15R, MOUNTED 6'-6 A.F.F. U.N.O.		CONTINUOUS ROW FLUORESCENT FIXTURE SURFACE MOUNTED		FEEDERS (USE HEAVY LINES AND DESIGNATE BY NUMBER CORRESPONDING TO LISTING IN FEEDER SCHEDULE)		AUTOMATIC TRANSFER SWITCH
	BELL AND BUZZER COMBINATION		QUADRUPLEX RECEPTACLE, 20 AMPERE, 120 VOLT, 2 POLE, 3 WIRE GROUNDING TYPE, NEMA 5-15R, MOUNTED 4 FEET A.F.F. U.N.O.		NEON LIGHTING		50 TM		THERMAL MAGNETIC DEVICE 50A THERMAL TRIP
	ANNUNCIATOR		DUPLEX RECEPTACLE, 20 AMPERE, 120 VOLT, 2 POLE, 3 WIRE GROUNDING TYPE, NEMA 5-15R, MOUNTED 18" A.F.F. U.N.O. NOTED AND CONNECT TO THE NORMAL/EMERGENCY SYSTEM, WITH A SMOOTH FINISH COVER PLATE. THE COVER PLATE SHALL HAVE THE WORD "EMERGENCY" WITH THE PANEL BOARD AND CIRCUIT NUMBER ENGRAVED AT THE TOP WITH WHITE-FILLED LETTERING.		CLOSED CIRCUIT TELEVISION CAMERA		STARTER, NON-REVERSING		
	COMPUTER DATA OUTLET		UNDERFLOOR DUCT AND JUNCTION BOX FOR TRIPLE, DOUBLE, OR SINGLE DUCT SYSTEM AS INDICATED BY NUMBER OF PARALLEL LINES		CELLULAR FLOOR HEADER DUCT		STARTER, REVERSING		
	INTERCONNECTING TELEPHONE		MOTOR - HORSEPOWER AS INDICATED		GENERATOR		NEW		3 PHASE, 4 WIRE, GROUNDED WYE
	TELEPHONE SWITCHBOARD		MANHOLE, PULL BOX OR SPLICING CHAMBER, COMPANY DESIGNATION (TO SCALE)		EXISTING		MANHOLE, PULL BOX OR SPLICING CHAMBER, COMPANY DESIGNATION (TO SCALE)		3 PHASE, 3 WIRE, DELTA
	BELL RINGING TRANSFORMER		CELLULAR FLOOR HEADER DUCT		JUNCTION BOX		EXISTING		AMMETER SWITCH
	ELECTRIC DOOR OPENER		EXISTING		NEW		VS		VOLTMETER SWITCH
	CHIME	-C	MOTOR - HORSEPOWER AS INDICATED		NEW		VS		SELECTOR SWITCH, LOCAL REMOTE CONTROL
	TELEVISION OUTLET	F	GENERATOR		PRIVATE VAULT (TO SCALE)		VS		MASTER ELEMENT INITIATING FAN OPERATION
	THERMOSTAT		MAGNETIC STARTER		EXISTING		VS		SHUNT TRIP
	HEAT DETECTOR (THERMAL DETECTOR)	I	COMBINATION MAGNETIC STARTER/N F DISCONNECT SWITCH		NEW		VS		VOLTMETER
			MOTOR PUSH BUTTON STATION		EXISTING		VS		AMMETER
			SPECIAL PURPOSE PANEL		NEW		VS		
			TELEPHONE PANEL		EXISTING		VS		
					INDICATING LIGHT - GREEN		VS		
					INDICATING LIGHT - RED		VS		
					INDICATING LIGHT - AMBER		VS		

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

PORT AUTHORITY OF ALLEGHENY COUNTY  
Pittsburgh, Pennsylvania  
NORTH SHORE CONNECTOR  
NSC TRAIN SYSTEM (SYSTEM-WIDE)  
STANDARD SYMBOLS  
SHEET 8 OF 15

Port Authority  
Contract No. NSC-009  
DWG. NO. GN307 SHT. 29

### ADDITIONAL ELECTRICAL LEGEND ITEMS

(M)	UTILITY KWH METER. PROVIDE 11 #14-1 1/2" C FROM C.T. COMPARTMENT TO METER		D1 → REPRESENTS DEMOLITION PHASE # → REPRESENTS WORK NOTE
<input type="checkbox"/>	DISCONNECT SWITCH, NONFUSED		P1 → REPRESENTS NEW CONST. PHASE # → REPRESENTS WORK NOTE
<input checked="" type="checkbox"/>	DISCONNECT SWITCH, FUSED		FUSED DISCONNECT SWITCH
	SURFACE MOUNTED PLUG MOLD		WALL BRACKET OUTLET & LIGHTING FIXTURE
	DUPLEX RECEPTACLE, 20 AMPERE, 120 VOLT, 2 POLE, 3 WIRE GROUNDING TYPE, NEMA 5-20R, MOUNTED 18" A.F.F. U.N.O.		SMOKE DETECTOR (DASHED INDICATES UNDER FLOOR)
	GFI DUPLEX RECEPTACLE, 20 AMPERE, 120 VOLT, 2 POLE, 3 WIRE GROUNDING TYPE, NEMA 5-20R, MOUNTED 42" A.F.F. U.N.O.		SMOKE DETECTOR IN DUCT
\$	SINGLE POLE TOGGLE SWITCH, 20 AMP, 120/227 VOLT, WITH COVER PLATE, 48" A.F.F. U.N.O.		FLOW DETECTOR SWITCH
(SP)	CEILING MOUNTED SPEAKER		PRESSURE DETECTOR/ SWITCH (BY DIV. 15)
	GROUND ROD		VALVE WITH TAMPER DETECTOR/SWITCH (BY DIV. 15)
	GROUND CONNECTION		
	PHOTOELECTRIC CELL		
	RECESSED FIXTURE, SLASH INDICATES FIXTURE WITH SELF CONTAINED EMERGENCY BALLAST.		
	FIRE ALARM ANNUNCIATOR PANEL		
	END OF LINE RESISTOR		
	COMBINATION FIRE ALARM AUDIO/ VISUAL DEVICE		
	MASTER STATION (FIRE ALARM SYSTEM)		
	LIGHT (LAMP, SIGNAL LIGHT, INDICATOR LAMP, STROBE)		
	TRANSFORMER		
	WIRING (CONNECTION IN FLOOR & BELOW GRADE)		
	GROUND CIRCUIT		
	CADWELD (CABLE TO CABLE)		
.	CADWELD		
	EMERGENCY OFF SWITCH		

### ADDITIONAL MECHANICAL LEGEND ITEMS

	REDUCED PRESSURE BACK FLOW PREVENTER	PA	PREACTION SYSTEM
	DUCTWORK INTERNALLY INSULATED OR ACOUSTIC LINED - SINGLE LINE	D	DRY SYSTEM
	FLOW DIRECTION		PRESSURE REGULATOR
	GAS PIPE		FIRE DAMPER
	REVERSE ACTING THERMOSTAT		VOLUME DAMPER
	TEMPERATURE SENSOR		EXHAUST FAN
	BLANKED OFF OR 3-WAY SUPPLY DIFFUSER		ROOF TOP AC UNIT
	POINT OF CONNECTION OF NEW TO EXISTING		CONDENSING UNIT
	DRY SPRINKLER PIPE		CABINET UNIT HEATER
	WET SPRINKLER PIPE		MAKE UP AIR UNIT
	EXISTING SPRINKLER PIPE		TRANSFER GRILLE
	PIPING TAKE OFF (TOP)		
	PIPING RISE OR DROP		
	PIPING TAKE OFF (BOTTOM)		
	DRY PENDANT SPRINKLER		
	EXISTING WET ALARM VALVE		
	EXISTING MULTIMATIC DELUGE ALARM VALVE		
	WET ALARM VALVE		
	MULTIMATIC DELUGE ALARM VALVE		
	DRY ALARM VALVE		
	REMOVE PIPING		

					<b>DMJM HARRIS   AECOM</b> FOUR GATEWAY CENTER 20TH FLOOR PITTSBURGH, PA 15222 <i>David J. H. 4/28/08</i> SIGNATURE APPROVED DATE	DESIGNED JC TRAUM	<b>PORT AUTHORITY OF ALLEGHENY COUNTY</b> PITTSBURGH  NORTH SHORE CONNECTOR NSC TRAIN SYSTEM (SYSTEM-WIDE) STANDARD SYMBOLS SHEET 9 OF 15
	DRAWN JC TRAUM						
	CHECKED TA SHANTZ						
	IN CHARGE CD JONES						
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	SHT. 30						
	REVISIONS						

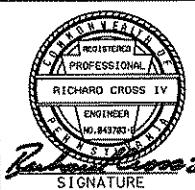
## TRACK SYMBOLS

	115 RE STANDARD RAIL (115 RE-Std)
	115 RE HIGH-STRENGTH RAIL (115 RE-HS)
	115 RE-HS W/ STRAP GUARD
	NONSTANDARD RAIL SECTION (AS INDICATED)
	NON INSULATED RAIL JOINT
	INSULATED RAIL JOINT
	BOLTED COMPROMISE JOINT
	COMPROMISE WELD
	RAIL CROSS BOND
	IMPEDIMENT BOND
	TRACK SWITCH ACTIVATOR
	UNDERGRADE BRIDGE
	OVERHEAD BRIDGE
	TUNNEL
	BITUMINOUS GRADE CROSSING (APPROXIMATE CROSSING ANGLE AS SHOWN)
	CONCRETE GRADE CROSSING (AS INDICATED)
	C-I-P or P-C-C
	BRICK
	SPECIAL GRADE CROSSING (AS INDICATED)
	POINT OF SWITCH (LOCATION OF SWITCH MACHINE)
	TURNOUT POINT OF INTERSECTION
	TURNOUT (LEFT HAND SHOWN)
	CROSSOVER
	DOUBLE CROSSOVER
	TRACK CROSSING
	EMERGENCY GUARD RAIL
	END OF TRACK BUMPING POST
	OTHER RAILWAY (AS NOTED)
	END OF TRACK, SAND BOX OR SAND BARRELS
	STATION OR STOP PLATFORM
	CURVE TO THE RT.
	CURVE TO THE LT.
	OF INCREASING STATIONS
	CURVE NUMBER
	DETAIL CONTINUES
	POINT OF CURVATURE, PROFILE GRADE POINT
	STATION EQUATION
	PI/PVI
	PROFILE GRADE LINE
	SUBGRADE
	SUBBASE
	CONCRETE
	CONCRETE PLINTH



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*Daniel P. Hearn 4/28/08*  
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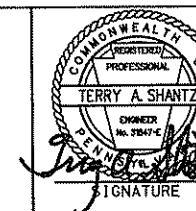
PORT AUTHORITY OF ALLEGHENY COUNTY  
PITTSBURGH  
NORTH SHORE CONNECTOR  
NSC TRAIN SYSTEM (SYSTEM WIDE)  
STANDARD SYMBOLS (TRACK)  
10 OF 15  
Port Authority  
CONTRACT NO. NSC-009  
DWO. NO. GN309 SHT. 31

## OCS SYMBOLS

TUBULAR POLE	●	F.T. OCS TENSION LENGTH WITH DISTANCE (XXXX FEET) BETWEEN ANCHOR POINTS OR HALF TENSION LENGTH FROM FIXED TERMINATION ANCHOR TO BALANCE WEIGHT ANCHOR	XXXX	PULLBOXES	PB
H-SECTION POLE	I			MANHOLE	MH
POLE W/SINGLE CANTILEVER	● —			CONDUIT RISER	CR
POLE W/TWIN CANTILEVER	● — —	MID-POINT ANCHOR AND HALF TENSION LENGTH DISTANCES (XXXX FEET) TO BALANCE WEIGHT ANCHORS	MPA XXXXXX	SECTION INSULATOR	
POLE W/ BACK-TO-BACK CANTILEVER	— ● —		TWA TWA	NON-BRIDGING SECTION INSULATOR	NB
POLE W/ BALANCE WEIGHT ANCHOR	● BWA	MID-POINT ANCHOR		CONDUCTORS CONNECTED	
POLE W/ FIXED TERMINATION ANCHOR	● FTA	IN-SPAN INSULATOR			
POLE W/ TIE WIRE ANCHOR	● TWA	IN-SPAN JUMPER	J		
HEADSPAN OR CROSS-SPAN	● — — ●	FULL FEEDING JUMPER	S	NEW MOTORIZED DISCONNECT SWITCH- NORMALLY CLOSED	
PORTAL	— — — —	POTENTIAL EQUALIZING JUMPER	O	NEW MOTORIZED DISCONNECT SWITCH- NORMALLY OPEN	
TUNNEL SUPPORT	—	DCS WIRE TO WIRE KNUCKLE	K	NEW MANUAL DISCONNECT SWITCH- NORMALLY CLOSED (NO)	
DOWN GUY ANCHOR	→	WIRE CROSS (CROSS-CONTACT BAR) ASSEMBLY		NEW MANUAL DISCONNECT SWITCH- NORMALLY OPEN	
STAGGER DIRECTION	↑			DISCONNECT SWITCH. NORMALLY CLOSED	
ZERO STAGGER	↓	SIMPLE CATENARY BALANCE WEIGHT TERMINATION	II	GROUND CONNECTION	
TRACK CENTERLINE	— - - -	SIMPLE CATENARY FIXED TERMINATION	II	SURGE ARRESTER	SA
IN-RUNNING OCS	● — ●	SINGLE CONTACT WIRE FIXED TERMINATION	+		
OUT-OF-RUNNING OCS	● — — ●	MID-POINT TERMINATION	II II	EXISTING WIRE NUMBER REFERENCE (TYP)	350 1
VERSINE (in) AND CURVE DIRECTION	8	INSULATED OVERLAP	DIRECTION OF TRAVEL		
SPAN LENGTH (ft)	50	UNINSULATED OVERLAP	DIRECTION OF TRAVEL		
POLE W/WIRE PULL-OFF	● — ○				

NO.	DATE	DESCRIPTION		REVISIONS
Gannett Fleming Transit & Rail Systems				

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

DESIGNED SR ADKINS  
DRAWN HT TRAN  
CHECKED TA SHANTZ  
IN CHARGE CD JONES  
DATE APR. 28, 2008  
SCALE NTS

PORT AUTHORITY OF ALLEGHENY COUNTY  
PITTSBURGH  
NORTH SHORE CONNECTOR  
NSC TRAIN SYSTEM (SYSTEM WIDE)  
STANDARD SYMBOLS (OCS)  
11 OF 15  
Port Authority  
CONTRACT NO. NSC-009  
DWG. NO. GN310 SHT. 32

**ANSI DEVICE DESIGNATIONS**

DEVICE No	DESCRIPTION
26	DIODE OVERTEMPERATURE
27	UNDERVOLTAGE RELAY
27A	UNDERVOLTAGE RELAY SIG SERVICE PANEL
27B	UNDERVOLTAGE RELAY FOR CONTROL POWER
27DCM	LOSS OF CONTROL POWER DC SWGR
27X	UNDERVOLTAGE AUXILIARY RELAY
30	ANNUNCIATOR
33	RECTIFIER DOOR SWITCH - DOOR CONTACTS
33X	DOOR OPEN AUXILIARY RELAY
43	SELECTOR SWITCH (LOCAL - REMOTE)
49	OVERTEMPERATURE RELAY
50	PHASE INSTANTANEOUS OVERCURRENT RELAY
50N	INSTANTANEOUS GROUND OVERCURRENT RELAY
51	PHASE TIME OVERCURRENT RELAY
51A	TIME OVERCURRENT RELAY - 300% RECTIFIER PROTECTION
51BX	AUXILIARY RELAY TO DEVICE 51B
51N	GROUND TIME OVERCURRENT RELAY
52	AC CIRCUIT BREAKER
59	OVERTVOLTAGE RELAY
63QL	TRANSFORMER LOW OIL LEVEL
63SP	TRANSFORMER SUDDEN PRESSURE RELAY
64C	GROUND DETECTOR RELAY- HOT STRUCTURE
64D	GROUND RELAY HOT STRUCTURE
64G/L	GROUND/ENERGIZED STRUCTURE RELAY
64N	NEGATIVE RAIL GROUNDING RELAY
64X	GROUND DETECTOR RELAY - GROUNDED STRUCTURE
64Y	GROUND RELAY GROUNDED STRUCTURE
72	DC CATHODE CIRCUIT BREAKER
74	ALARM RELAY
76	DC OVERCURRENT RELAY
82	RECLOSING RELAY
83	AUTOMATIC TRANSFER RELAY
84	FUSE BLOWN RELAY
85	TRANSFER TRIP RELAY
86	LOCKOUT RELAY - HAND RESET
89	DISCONNECT SWITCH
94	AUXILIARY CLOSING RELAY
95M	MASTER EMERGENCY TRIP RELAY
127	DC UNDERVOLTAGE RELAY
129	DC ISOLATING CONTACTOR
150	DC RATE OF RISE OVERCURRENT RELAY
159	DC OVERTVOLTAGE RELAY
164G	GROUNDED DC EQUIPMENT ENCLOSURE RELAY
164H	ENERGIZED DC EQUIPMENT ENCLOSURE RELAY
172	DC FEEDER CIRCUIT BREAKER
176	DC OVERCURRENT DEVICE
182	DC LOAD MEASURING DEVICE
183	DC VOLTAGE SENSING DEVICE
185	DC TRANSFER TRIP TRANSMIT RELAY
185RX	DC TRANSFER TRIP RECEIVER RELAY
186	DC LOCKOUT RELAY - HAND RESET
189	DC DISCONNECT SWITCH
194	EMERGENCY DC CUT-OFF RELAY
195	EMERGENCY TRIP RELAY

**TRACTION POWER SYMBOLS**

	EMERGENCY TRIP SWITCH		BUS OR CABLE		DRAWOUT DEVICE
	VARIABLE RESISTOR		STATUS AND CONTROL CIRCUITS		POTENTIAL/VOLTAGE TRANSFORMER (PT)
	DIGITAL POWER METER		ELECTRICAL INTERLOCK		CURRENT TRANSFORMER (CT)
	LOAD MEASURING RESISTOR		SIGNAL FLOW DIRECTION INDICATOR		TRANSFORMER
	NO LOAD TAP CHANGER		CONNECTION		
	RECEPTACLE, DC BREAKER TEST SET		DRAWOUT DC CIRCUIT BREAKER		INTERPHASE TRANSFORMER
	RECEPTACLE, EMERGENCY GENERATOR		DISCONNECT SWITCH (MANUAL)		DELTA-CONNECTED TRANSFORMER
	FIBERGLASS CABLE TRAY		LOW VOLTAGE CIRCUIT BREAKER		WYE-CONNECTED TRANSFORMER
	HOMERUN TO PANEL. QUANTITY OF ARROWS INDICATES NUMBER OF CONDUITS. QUANTITY OF CROSS MARKS INDICATES NUMBER OF CONDUCTORS. MINIMUM CONDUCTOR SIZE IS 12 AWG UNLESS OTHERWISE NOTED.		BATTERY		PUSHBUTTON
	EXPOSED CONDUIT WITH NEW CONDUCTORS AS SHOWN. CONDUIT IS GALVANIZED RIGID STEEL UNLESS OTHERWISE NOTED.		POTENTIAL TRANSFER FUSED GROUNDING CONTACT		RECTIFIER
	EXISTING CONDUIT WITH NEW CONDUCTORS INSTALLED AS SHOWN.		LIGHTNING ARRESTER		MOTORIZED DISCONNECT SWITCH-NORMALLY CLOSED
	CONDUIT STUB-UP		SURGE ARRESTER		DISCONNECT SWITCH-NORMALLY CLOSED
	CONDUIT TERMINATION		SILICON DIODE RECTIFIER		DISCONNECT SWITCH-NORMALLY OPEN
	CONDUIT OR CABLE TURNING UP OR TOWARD VIEWER		COIL		UNINSULATED OVERLAP
	CONDUIT OR CABLE TURNING DOWN OR AWAY FROM VIEWER		GROUND		SECTION INSULATOR
	1/4" X 2" GROUND BUS		DIRECT CURRENT SHUNT		NORMALLY CLOSED CONTACT
	INSULATED GROUNDING ELECTRODE CONDUCTOR		HALL EFFECT TRANSDUCER		NORMALLY OPEN CONTACT
	GROUND CONDUCTOR CONNECTION BETWEEN GROUND BUS AND EQUIPMENT ENCLOSURE		KEY INTERLOCK		FUSED DISCONNECT
	PANEL - DESCRIPTION AS SHOWN		AMMETER-SCALE AS SHOWN		LOCAL ANNUNCIATOR PANEL
	EQUIPMENT - DESCRIPTION AS SHOWN		AMMETER SELECTOR		NO-LOAD TAP CHANGER
	INDIVIDUALLY ENCLOSED CIRCUIT BREAKER		TEST SWITCH		EYE WASH
	MAGNETIC MOTOR STARTER		VOLTMETER-SCALE AS SHOWN		TELEPHONE
	TRANSFORMER		CURRENT TRANSDUCER		FIRE EXTINGUISHER
	PULL BOX		VOLTAGE TRANSDUCER		
	JUNCTION BOX		WATT TRANSDUCER		
	MOTOR - NUMBER INDICATES HORSEPOWER		EMERGENCY TRIP RELAY		
	DUPLEX RECEPTACLE		AC MEDIUM-VOLTAGE CIRCUIT BREAKER (DRAW-OUT)		
	SNAP SWITCH		GENERATOR		
	SECTION IDENTIFICATION AND ORIENTATION		METER		
	BUS DUCT		RELAY (REFER TO ANSI DEVICE TABLE)		
	DC FEEDER BREAKER- SERIES TRIP DEVICE		ACTUATING DEVICE (REFER TO ANSI DEVICE TABLE)		
	CONTACTOR				

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DMJM HARRIS | AECOM  
FOUR GATEWAY CENTER  
20TH FLOOR  
PITTSBURGH, PA. 15222  
HILLARD SOROKIN  
DRAFTED BY: HILLARD SOROKIN  
APPROVED BY: HILLARD SOROKIN  
DATE: APR. 28, 2008  
SIGNATURE: [Signature]

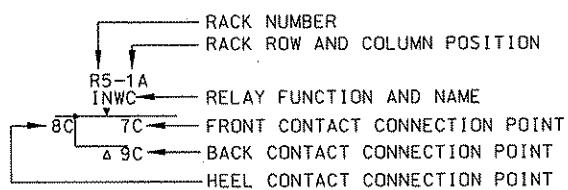
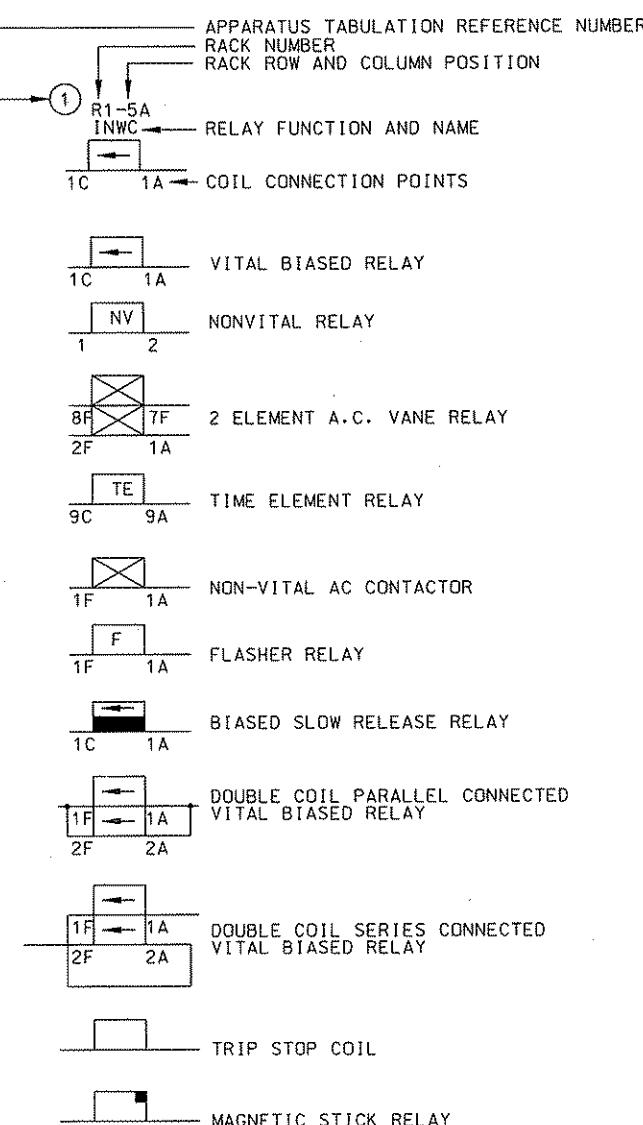
DESIGNED BY: H. SOROKIN  
DRAWN BY: J. TRAUM  
CHECKED BY: ND RASSIAS  
IN CHARGE: CD JONES  
DATE: APR. 28, 2008  
SCALE: NTS

APPROVED BY: HILLARD SOROKIN  
DATE: APR. 28, 2008

PORT AUTHORITY OF ALLEGHENY COUNTY  
PITTSBURGH, PENNSYLVANIA  
NORTH SHORE CONNECTOR  
NSC TRAIN SYSTEM (SYSTEM WIDE)  
STANDARD SYMBOLOGY (TRACTION POWER)  
12 OF 15  
Port Authority  
CONTRACT NO. NSC-009  
DWG. NO. GN311 SHT. 33

## SIGNAL SYMBOLS

### RELAY & CONTACT SYMBOLS



- NORMALLY CLOSED FRONT CONTACT
- NORMALLY OPEN FRONT CONTACT
- NORMALLY CLOSED BACK CONTACT
- NORMALLY OPEN BACK CONTACT
- MAGNETIC BLOWOUT CONTACT
- HEAVY DUTY CONTACT
- NORMALLY ENERGIZED TRANSFER CONTACT
- NORMALLY ENERGIZED TRANSFER CONTACT
- NORMALLY DE-ENERGIZED TRANSFER CONTACT
- NORMALLY DE-ENERGIZED TRANSFER CONTACT
- FLASHING CONTACT
- PUSH BUTTON CONTACT (PUSH TO BREAK/MAKE)
- PUSH BUTTON CONTACT (PUSH/PULL TO MAKE)
- PUSH BUTTON CONTACT (PUSH/PULL/TURN)



VOLTMETER



AMMETER



KNIFE SWITCH



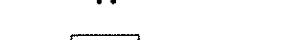
TOGGLE SWITCH (ON/OFF)



TOGGLE SWITCH (3 POSITIONS)



KEY OPERATED SWITCH (CLOSED)



KEY OPERATED SWITCH (OPEN)



VOLT OR AMMETER



SWITCH MACHINE CIRCUIT CONTROLLER



SWITCH MACHINE MOTOR



HAND CRANK CUTOUT



INTERIOR OF HOUSING



EQUIPMENT HOUSING



POSITIVE ENERGY BUSS



NEGATIVE ENERGY BUSS



TWISTED PAIR OF CONDUCTORS



PHONE JACK



WIRE AS SHOWN



LIGHTNING ARRESTOR



NON-INDICATING FUSE



CIRCUIT BREAKER SINGLE POLE



CIRCUIT BREAKER DOUBLE POLE

### CIRCUIT SYMBOLS



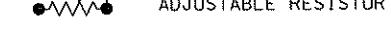
INDICATING FUSETRON



HIGH VOLTAGE FUSE



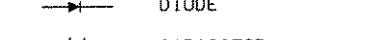
ADJUSTABLE RESISTOR



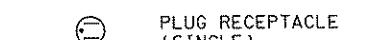
RESISTOR



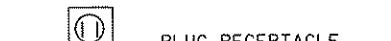
DIODE



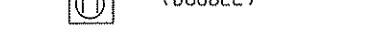
CAPACITOR



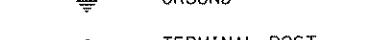
PLUG RECEPTACLE (SINGLE)



PLUG RECEPTACLE (DOUBLE)



GROUND



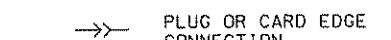
TERMINAL POST



BUSS STRAP



TEST STRAP



PLUG OR CARD EDGE CONNECTION



BATTERY

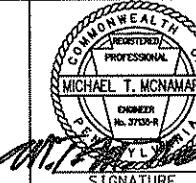
— DENOTES TWISTED PAIR WITH SHIELD

— DENOTES CABLE WITH SHIELD

— PROCESSOR RACK TERMINAL

NO.	DATE	DESCRIPTION	
		REVISIONS	

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PROFESSIONAL  
MICHAEL T. McNAMARA  
PENNSYLVANIA  
Pittsburgh, PA 15222  
APRIL 28, 2008  
Signature

DMJM HARRIS | AECOM  
FOUR GATEWAY CENTER  
20TH FLOOR  
PITTSBURGH, PA. 15222  
IN CHARGE CD JONES  
DATE APR. 28, 2008  
APPROVED DATE  
L. NARANG  
HT TRAN  
Scale NTS

PORT AUTHORITY OF ALLEGHENY COUNTY	
Pittsburgh, Pennsylvania	
NORTH SHORE CONNECTOR	NSC TRAIN SYSTEM (SYSTEM WIDE)
STANDARD SYMBOLS (SIGNALS)	13 OF 15
Port Authority	CONTRACT NO. NSC-009
DWG. NO. GN312	SHT. 34

### SIGNAL SYMBOLS

#### TRACK PLAN SYMBOLS

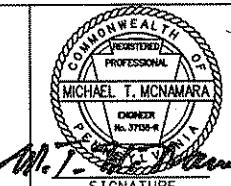
	INTERLOCKING SIGNAL (G/R, Y/R, R/R)
	INTERLOCKING SIGNAL (Y/R, R/R)
	DWARF SIGNAL (Y, R)
	AUTOMATIC SIGNAL (G,Y,R)
	AUTOMATIC SIGNAL (Y/LW, R)
	INTERLOCKING SIGNAL (Y/R/LW, Y/R, R/R)
	RELAY/INSTRUMENT ROOM
	SNOW MELTER CONTROL CASE
	TWC COIL
	TRAIN STOP COIL (ENERGIZED)
	TRAIN STOP COIL (DE-ENERGIZED)
	DUAL CONTROL POWER OPERATED SWITCH MACHINE
	MANHOLE
	PRESENCE DETECTOR
	YARD LIMIT SIGN

#### CONTROL PANEL SYMBOLS

	TOGGLE SWITCH
	SIGNAL LEVER (PUSH/PULL)
	SIGNAL LEVER (PUSH/PULL/TURN)
	TRACK OR SWITCH INDICATION LIGHT
	SIGNAL
	PANEL LAMP (W=WHITE, R=RED, G=GREEN, B=BLUE, A=AMBER)
	EMERGENCY KEY SWITCH
	SELECTOR SWITCH
	SWITCH TEST LEVER (CENTER,RIGHT,LEFT)

NO.	DATE	DESCRIPTION	
		REVISIONS	

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

**PORT AUTHORITY OF ALLEGHENY COUNTY**  
PENNSYLVANIA  
NORTH SHORE CONNECTOR  
NSC TRAIN SYSTEM (SYSTEM WIDE)  
STANDARD SYMBOLS (SIGNALS)  
14 OF 15  
Port Authority  
CONTRACT NO. NSC-009  
DWG. NO. GN313 SHT. 35

## COMMUNICATIONS SYMBOLS

### BLOCK DIAGRAM SYMBOLS

	POLE
	NEW POLE
	PA AMPLIFIER & CONTROL EQUIPMENT
	MICROPHONE
	PA HORN SPEAKER
	PA MONITOR SPEAKER
	PA HORN SPEAKER WITH RECESSED HOUSING
	DUAL SPEAKER
	RECESSED HOUSING WITH CONE SPEAKER
	SURFACE MOUNTED HOUSING WITH CONE SPEAKER
	DATA TRANSMISSION SYSTEM REMOTE TERMINAL UNIT
	JUNCTION BOX
362+00	STATIONING OR STATION CHAINING
	PATRON EMERGENCY TELEPHONE
	EMERGENCY TELEPHONE
	TELEPHONE - PBX SYSTEM
	VARIABLE MESSAGE SIGN - PA ADA VISUAL SIGNAGE DOUBLE SIDED
	CCTV CAMERA
	LOUDSPEAKER
	INSTALLED BY OTHERS OR SUPPLIED UNDER SEPARATE CONTRACT
	CARRIER TRANSMISSION SYSTEM
	MULTIPLEX SHELF (CHANNEL BANK)
	T1-TYPE PCM INTERMEDIATE LINE REPEATER
	OFFICE REPEATER

### SCHEMATIC SYMBOLS

	ORDER WIRE PHONE JACK
	4 FIBERS (EACH PAIR TAKING A DISTINCT ROUTE), DS-1.
	2 FIBERS, SONET RING.
	2 COPPER PAIRS, DSL.
	WIRELESS T1, DS-1
	2 FIBERS, DS-1
	INTERFACE TO OTHER SUBSYSTEM
	OC-12 #1-1
	DSX
	FSE
	FDP
	MDF
	DPP
	RTU
	TEL
	TB
	PA AMPLIFIER
	PA SPEAKER
	TICKET VENDING MACHINE
	FIBER OPTIC CABLE
	CHANNEL BANK
	50 OHM TERMINATION
	ANTENNA
	START LIGHT
	EQUAL POWER $\frac{3}{4}$ WAVE LENGTH MATCHING TRANSFORMER SPLITTER
	UNEQUAL POWER $\frac{3}{4}$ WAVE LENGTH MATCHING TRANSFORMER SPLITTER

### LAYOUT SYMBOLS

	TRACTION POWER SUBSTATION
	TIE BREAKER STATION
	SIGNAL RELAY ROOM
	FAN ROOM
	BRIDGE
	PASSENGER HIGH STATION
	PASSENGER STOP
	STAGE I TRACKS
	STAGE II TRACKS
	TUNNEL
	BASE STATION
	AUXILIARY RECEIVER
	PORTAL
	COMMUNICATIONS ROOM
	COMMUNICATIONS SHELTER
	SIGNAL CENTRAL INSTRUMENT HOUSE
	BELOW GROUND ANTENNA
	ABOVE GROUND ANTENNA
	VOTER
	START LIGHT
	FUTURE REQUIREMENTS
	NEW COMMUNICATIONS SYSTEM SHOWN IN BOLD WHEN TIEING INTO THE EXISTING SYSTEM

### CABLE PLAN SYMBOLS

	EXISTING MULTICONDUCTOR COPPER CABLE (REPLACE WITH NEW)
	NEW MULTICONDUCTOR COPPER CABLE
	EXISTING CXR CABLE (NOT TO BE REPLACED, WILL REMAIN IN SERVICE)
	NEW FIBER OPTIC CABLE

 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 PRESIDENTIAL PROFESSIONAL LICENSE NO. 2704-A EXPIRED APR. 2008	<b>DMJM HARRIS</b> FOUR GATEWAY CENTER 20TH FLOOR PITTSBURGH, PA. 15222   Michael T. McNamara APPROVED DATE 4/28/08	<b>AECOM</b> IN CHARGE CD JONES DATE APR. 28, 2008   David P. Harris APPROVED DATE 4/28/08	<small>DESIGNED RJ WEIDNER DRAWN HT TRAN CHECKED D ZUCK IN CHARGE CD JONES DATE APR. 28, 2008 SCALE NTS</small>	<b>PORT AUTHORITY OF ALLEGHENY COUNTY</b> PITTSBURGH NORTH SHORE CONNECTOR NSC TRAIN SYSTEM (SYSTEM WIDE) STANDARD SYMBOLS (COMMUNICATIONS) 15 OF 15
NO. DATE DESCRIPTION REVISIONS									

Port Authority  
 CONTRACT NO. NSC-009  
 DWG NO. GN314 SHT. 36

### VENTILATION SYMBOLS

-  - AXIAL TUNNEL VENTILATION (TV) FAN
-  - TUNNEL VENTILATION DAMPER
-  - JET FAN
-  - NOISE ATTENUATOR
-  - INLET/OUTLET
-  - TURNING VANES IN DUCT
-  - TUNNEL VENTILATION SACCARDO NOZZLE
-  - PLATFORM EXHAUST INLET (BALANCING DAMPER)
-  - FIRE DAMPER
-  - INTAKE AIR FLOW ARROW
-  - EXHAUST AIR FLOW ARROW

### FIRE PROTECTION SYMBOLS

-  - AUTOMATIC AIR VENT
-  - AUTOMATIC AIR VENT WITH VACUUM BREAKER
-  - DUAL HEAD FIRE HYDRANT
-  - EMERGENCY TUNNEL LIGHT
-  - FIRE DEPARTMENT CONNECTION
-  - FIRE HYDRANT
-  - ISOLATION VALVE
-  - STANDPIPE DRAIN POINT
-  - TUNNEL LIGHT

### ELECTRICAL SYMBOLS

- |   |                                       |   |                                 |
|---|---------------------------------------|---|---------------------------------|
|    | - CIRCUIT BREAKER                     |  | - SELECTOR SWITCH 2 POSITION    |
|    | - NORMALLY OPEN CONTACT               |  | - MOTOR WHERE X = NO. OF PHASES |
|    | - NORMALLY OPEN CONTACT               |  | - PLC DIGITAL INPUT             |
|    | - NORMALLY OPEN CONTACT               |  | - PLC DIGITAL OUTPUT            |
|    | - LIMIT SWITCH NORMALLY OPEN          |  | - PLC ANALOG INPUT              |
|    | - LIMIT SWITCH NORMALLY CLOSED        |  | - EARTH                         |
|    | - PUSH BUTTON NORMALLY OPEN           |  | - MECHANICAL INTERLOCK          |
|    | - PUSH BUTTON NORMALLY CLOSED         |  | - SCREEN/SHIELD                 |
|    | - LOCKOUT STOP BUTTON NORMALLY CLOSED |  | - CAPACITOR                     |
|    | - FLOAT SWITCH NORMALLY OPEN          |   |                                 |
|    | - THERMAL OVERLOAD NORMALLY CLOSED    |   |                                 |
|    | - TIMED CONTACT NORMALLY OPEN         |   |                                 |
|    | - DIODE                               |   |                                 |
|   | - LATE MAKE EARLY BREAK CONNECTION    |   |                                 |
|  | - LINK                                |   |                                 |
|  | - RESISTOR                            |   |                                 |
|  | - ANTI-CONDENSATION HEATER            |   |                                 |
|  | - RESISTIVE TEMPERATURE DEVICE        |   |                                 |
|  | - TERMINAL MCC                        |   |                                 |
|  | - TERMINAL PLC MARSHALLING CABINET    |   |                                 |
|  | - TERMINAL LOCAL CONTROL STATION      |   |                                 |
|  | - CURRENT TRANSFORMER                 |   |                                 |
|  | - RELAY/CONTACTOR COIL                |   |                                 |
|  | - TIMER RELAY DELAY OPERATING         |   |                                 |
|  | - INDICATOR LIGHT WITH PUSH TO TEST   |   |                                 |

NOTE:  
1. THESE SYMBOLS SUPERSEDE ANY OTHER STANDARD SYMBOLS  
DRAWINGS FOR THE NSC-009 CONTRACT DRAWINGS.

### EQUIPMENT NUMBERING SCHEME

#### NUMBER FORMAT: AB-CDE-123-F

##### AB: STATION ABBREVIATION

- GW - GATEWAY STATION  
 NS - NORTH SIDE STATION  
 (x = E = EAST / W = WEST)

##### CDE: EQUIPMENT TYPE

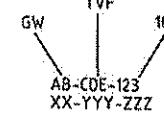
- ISV - ISOLATION VALVE  
 PN - INSTRUMENT PANEL  
 SSP - SUBMERSIBLE SUMP PUMP  
 TJF - TUNNEL JET FAN  
 TVA - TUNNEL VENTILATION ATTENUATOR  
 TVO - TUNNEL VENTILATION DAMPER  
 TVF - TUNNEL VENTILATION FAN

##### 123: EQUIPMENT NUMBER

- 1 - STATION NUMBER (THE FIRST TWO NUMBERS ARE REDUNDANT)  
 1 = GATEWAY, 2 = NORTH SIDE
- 2 - ZERO FOR DAMPERS ASSOCIATED WITH PARTICULAR FANS,  
 ONE OR MORE FOR ADDITIONAL DAMPERS.
- 3 - SEQUENTIAL EQUIPMENT NUMBER.

##### F: ATTENUATOR IDENTIFIER

- A - FOR ATM SIDE  
 T - FOR TUNNEL SIDE



MAUNSELL | AECOM

Hannsall Australia Pty Ltd A.B.N. 20 093 846 925

*C Stacey*  
APPROVED

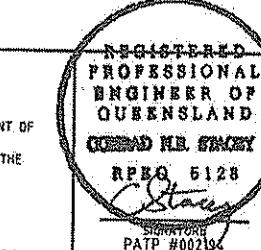
JUNE 27, 2008

DATE

DESCRIPTION

REVISIONS

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 FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF  
 TRANSPORTATION, UNDER THE URBAN MASS  
 TRANSPORTATION ACT OF 1966, AS AMENDED, FOR THE  
 PORT AUTHORITY OF ALLEGHENY COUNTY,  
 PENNSYLVANIA.



DMJM HARRIS | AECOM

FOUR GATEWAY CENTER  
 20TH FLOOR  
 PITTSBURGH, PA. 15222

APPROVED DATE

DESIGNED AP  
 DRAWN R  
 CHECKED P  
 IN CHARGE CS  
 DATE 6/27/08  
 SCALE KTS

PORT AUTHORITY OF ALLEGHENY COUNTY  
 PITTSBURGH PENNSYLVANIA

NORTH SHORE CONNECTOR  
 NSC TRAIN SYSTEM (SYSTEM WIDE)  
 STANDARD SYMBOLS

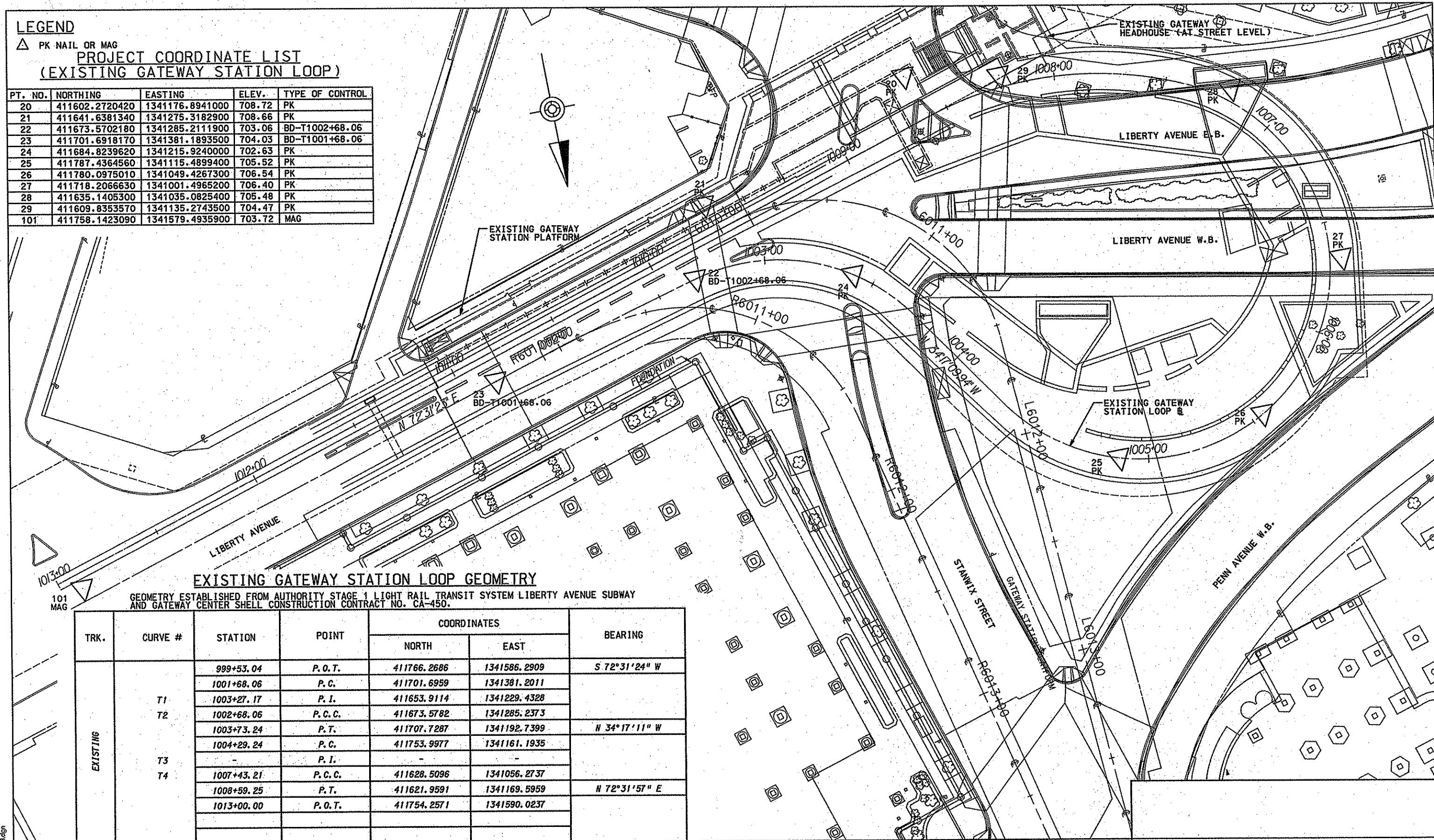
Port Authority CONTRACT NO. NSC-009  
 DWG. NO. GN-315 SHT. 37

## LEGEND

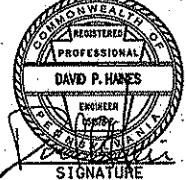
PK NAIL OR MAG

PROJECT COORDINATE LIST  
(EXISTING GATEWAY STATION LOOP)

PT. NO.	NORTHING	EASTING	ELEV.	TYPE OF CONTROL
20	411602.2720420	1341176.8941000	708.72	PK
21	411641.6381340	1341275.3182900	708.66	PK
22	411673.5702180	1341285.2111900	703.06	BD-T1002+68.06
23	411701.6918170	1341381.1893500	704.03	BD-T1001+68.06
24	411684.8239620	1341215.9240000	702.63	PK
25	411787.4364560	1341115.4899400	705.52	PK
26	411780.0975010	1341049.4267300	706.54	PK
27	411718.2066630	1341001.4965200	706.40	PK
28	411635.1405300	1341035.0625400	705.48	PK
29	411609.8353570	1341135.2743500	704.47	PK
101	411758.1423090	1341579.4935900	703.72	MAG



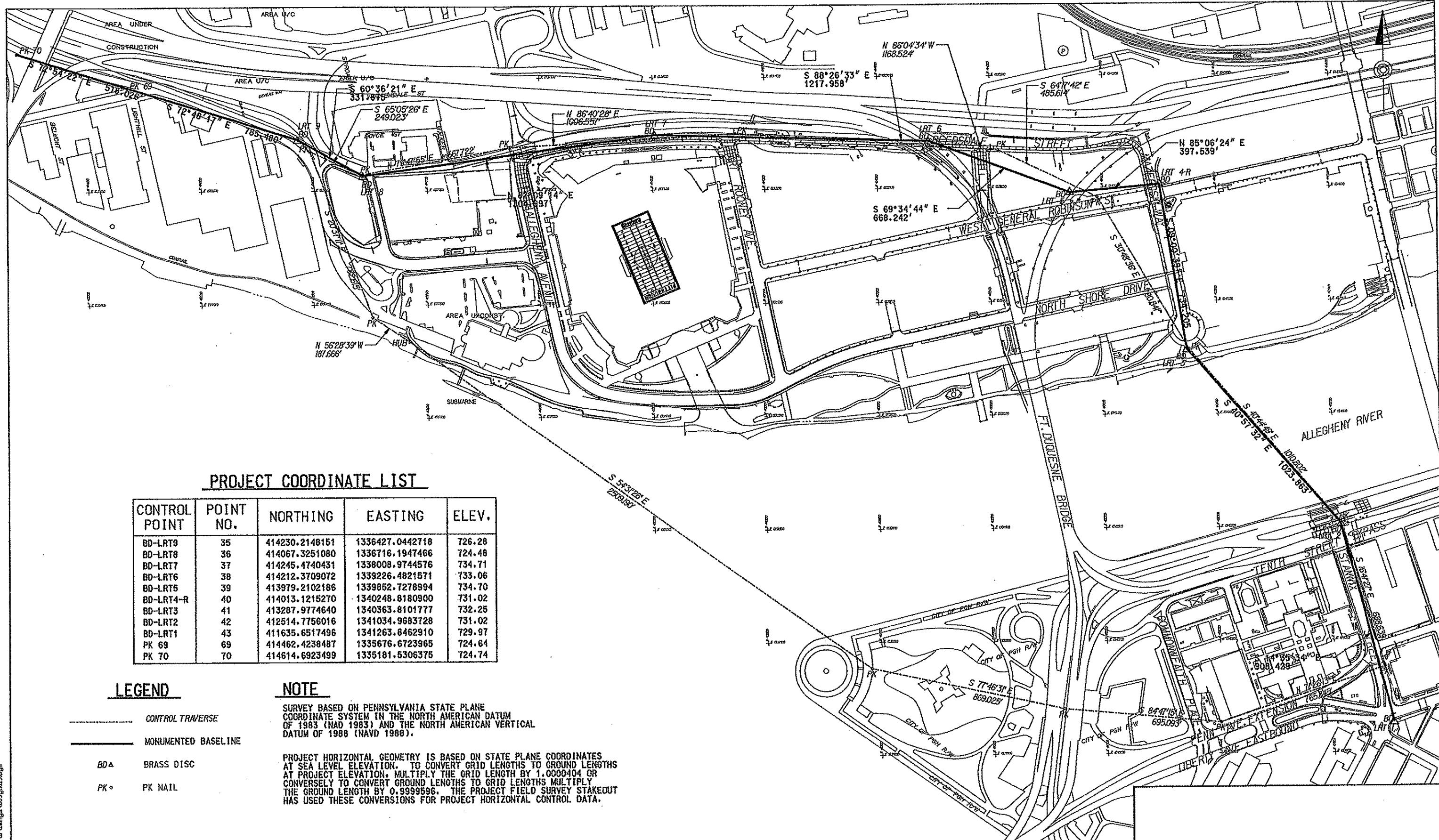
THE PREPARATION OF THIS DOCUMENT HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL TRANSIT ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION, UNDER THE URBAN MASS TRANSPORTATION ACT OF 1964, AS AMENDED, FOR THE PORT AUTHORITY OF ALLEGHENY COUNTY, PENNSYLVANIA.



DAVID P. HANES  
FOUR GATEWAY CENTER  
20TH FLOOR  
PITTSBURGH, PA. 15222  
*David P. Hanes*  
APPROVED  
DATE APRIL 21, 2008

DTK  
DRAWN CAM  
CHECKED DPH  
IN CHARGE DPH  
DATE APRIL 21, 2008  
SCALE 20' 15' 10' 5' 0  
20

PORT AUTHORITY OF ALLEGHENY COUNTY  
Pittsburgh, Pennsylvania  
NORTH SHORE CONNECTOR  
NSC TRAIN SYSTEMS (SYSTEM WIDE)  
HORIZONTAL AND VERTICAL SURVEY CONTROL  
WITHIN EXISTING GATEWAY STATION LOOP  
Port Authority  
CONTRACT NO. NSC-009  
DWG. NO. GN400  
SHT. 38



CONTROL POINT	POINT NO.	NORTHING	EASTING	ELEV.
BD-LRT9	35	414230.2148151	1336427.0442718	726.28
BD-LRT8	36	414067.3251080	1336716.1947466	724.48
BD-LRT7	37	414245.4740431	1338008.9744576	734.71
BD-LRT6	38	414212.3709072	1339226.4821571	733.06
BD-LRT5	39	413979.2102186	1339852.7278994	734.70
BD-LRT4-R	40	414013.1215270	1340248.8180900	731.02
BD-LRT3	41	413287.9774640	1340363.8101777	732.25
BD-LRT2	42	412514.7756016	1341034.9683728	731.02
BD-LRT1	43	411635.6517496	1341263.8462910	729.97
PK 69	69	414462.4238487	1335676.6723965	724.64
PK 70	70	414614.6923499	1335181.5306375	724.74

## LEGEND

**NOTE**

CONTROL TRAVERSE

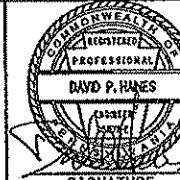
BD A BRASS DISC

PK. PK NAIL

PROJECT HORIZONTAL GEOMETRY IS BASED ON STATE PLANE COORDINATES AT SEA LEVEL ELEVATION. TO CONVERT GRID LENGTHS TO GROUND LENGTH AT PROJECT ELEVATION, MULTIPLY THE GRID LENGTH BY 1.0000404 OR CONVERSELY TO CONVERT GROUND LENGTHS TO GRID LENGTHS MULTIPLY THE GROUND LENGTH BY 0.9999596. THE PROJECT FIELD SURVEY STAKEOUT HAS USED THESE CONVERSIONS FOR PROJECT HORIZONTAL CONTROL DATA.

PROJECT HORIZONTAL GEOMETRY IS BASED ON STATE PLANE COORDINATES AT SEA LEVEL ELEVATION. TO CONVERT GRID LENGTHS TO GROUND LENGTH AT PROJECT ELEVATION, MULTIPLY THE GRID LENGTH BY 1.0000404 OR CONVERSELY TO CONVERT GROUND LENGTHS TO GRID LENGTHS MULTIPLY THE GROUND LENGTH BY 0.9999596. THE PROJECT FIELD SURVEY STAKEOUT HAS USED THESE CONVERSIONS FOR PROJECT HORIZONTAL CONTROL DATA.

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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

PISSOURIN, PAT 10222

Dad Klein 4/23/08  
APPROVED DATE

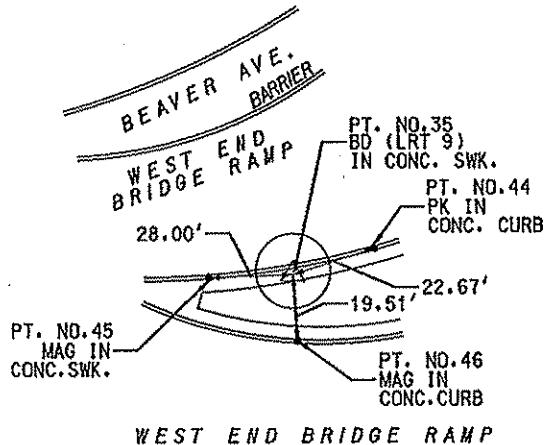
DESIGNED	MLH
DRAWN	JMB
CHECKED	JAS
IN CHARGE	DPH
DATE	APRIL 28. 20
REMARKS	

**PORT AUTHORITY OF ALLEGHENY COUNTY**  
PITTSBURGH, PENNSYLVANIA

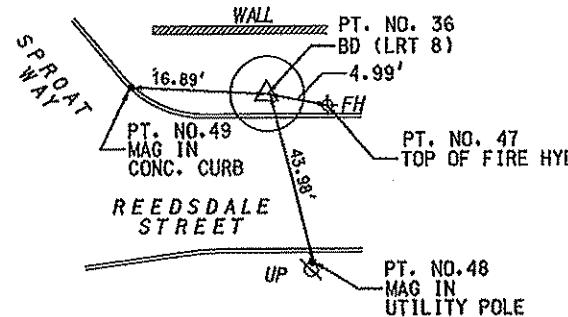
**NORTH SHORE CONNECTOR  
NSC TRAIN SYSTEMS (SYSTEM WIDE)  
HORIZONTAL AND VERTICAL  
SURVEY CONTROL**

orify

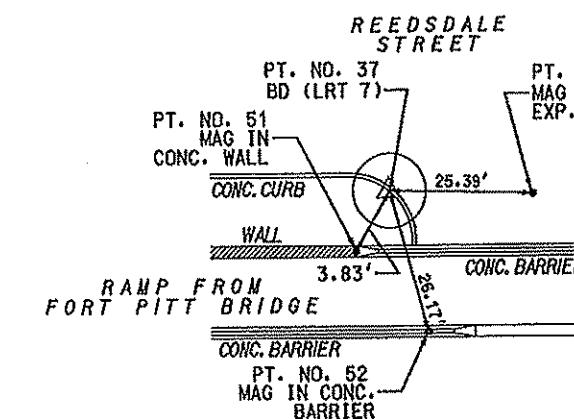
CONTRACT NO. NSC-009



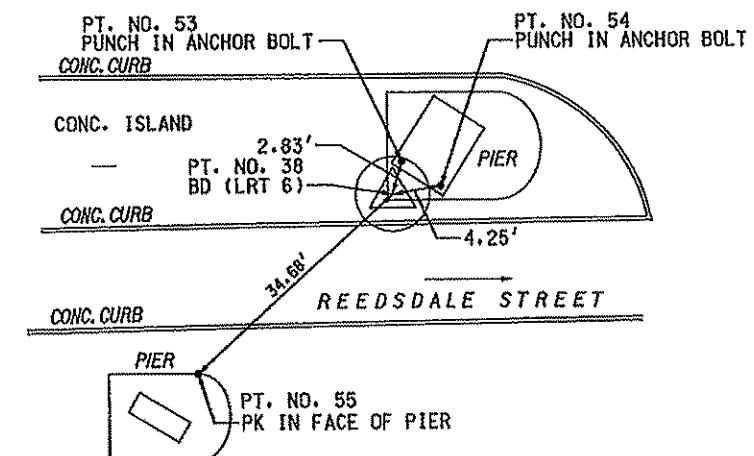
CONTROL POINT LRT 9



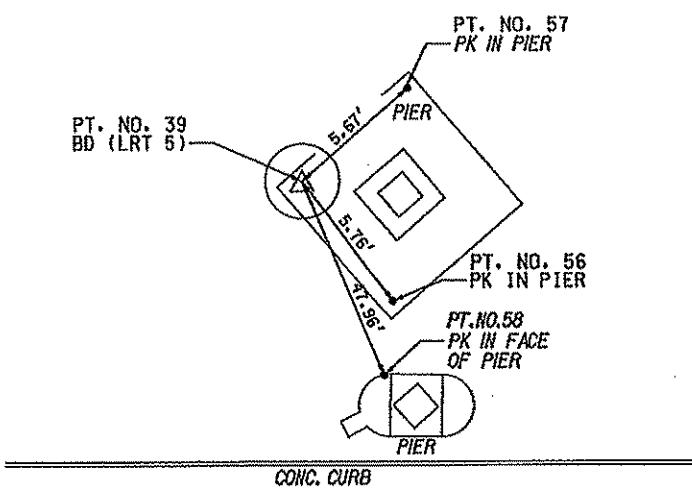
CONTROL POINT LRT 8



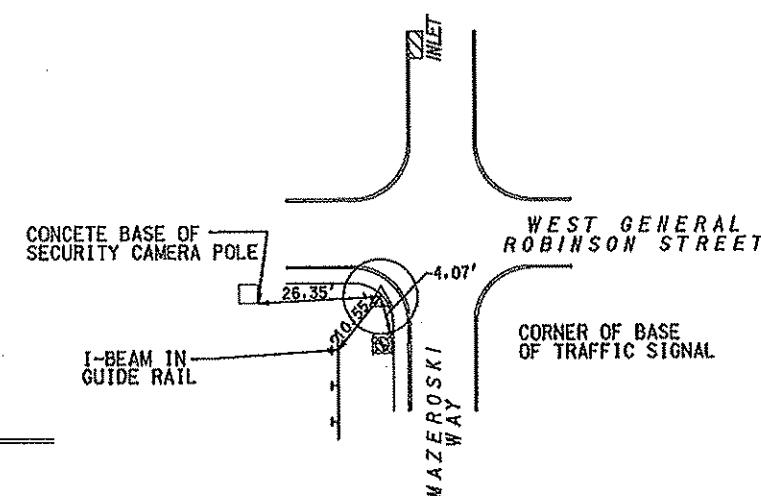
CONTROL POINT LRT



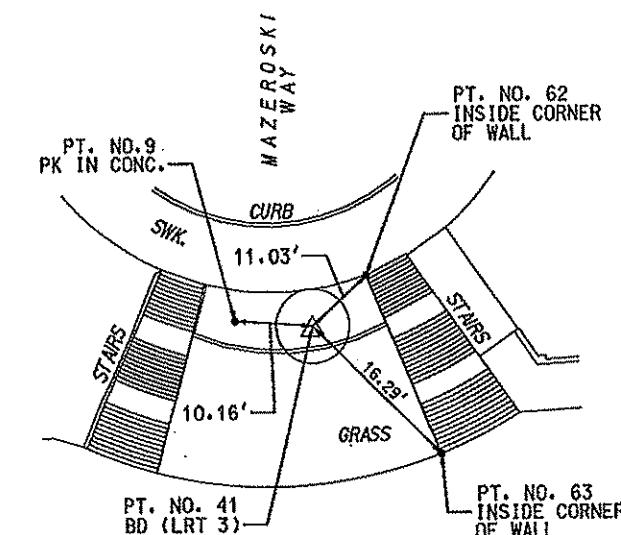
CONTROL POINT LRT 6



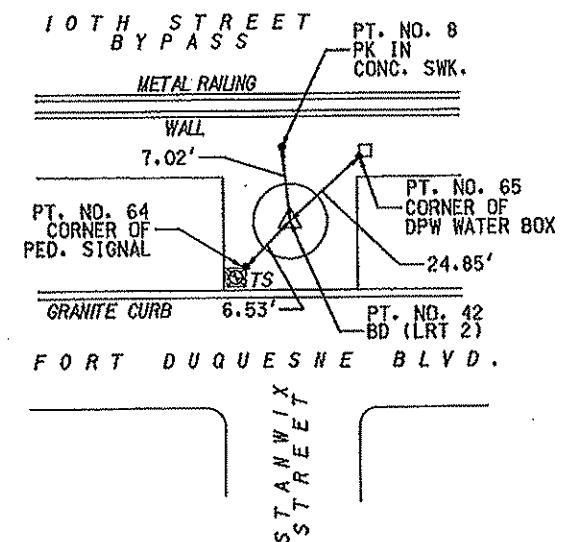
WEST GENERAL ROBINSON STREET



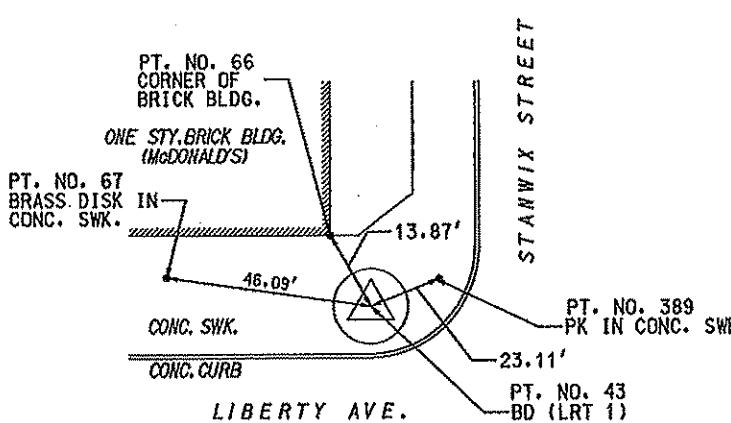
CONTROL POINT LRT 4-F



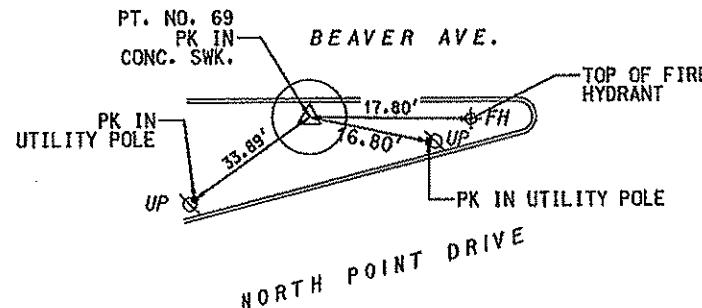
CONTROL POINT LRT 3



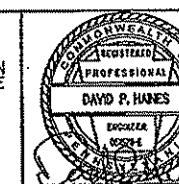
S  
CONTROL POINT LRT 2



CONTROL POINT LRT 1



CONTROL POINT NO. 69



**DMJM HARRIS** | AECON  
FOUR GATEWAY CENTER  
20TH FLOOR  
PITTSBURGH, PA. 15222  
 **Paul P. O'Brien**

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**PORT AUTHORITY OF ALLEGHENY COUNTY**

**NORTH SHORE CONNECTOR  
NSC TRAIN SYSTEMS (SYSTEM WIDE)  
CONTROL TRAVERSE  
REFERENCE TIES**

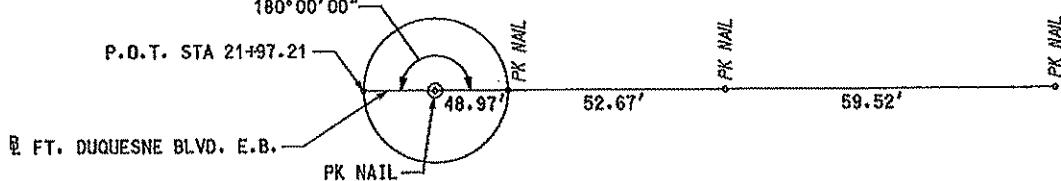
CONTRACT NO.	NSC-009	
DWG. NO.	GN402	SHT. 40

PT. #31  
B.M. ELEV. 715.15  
PK. NAIL IN CONCRETE SIDEWALK  
ALONG ALLEGHENY RIVER  
STA. L6020+68.35, 21.98' LEFT  
STA. 10+43.91 30.85' LT.  
TENTH STREET BY-PASS W.B. (COMPUTED)

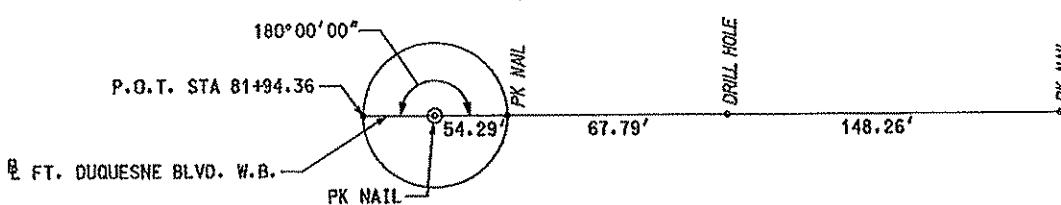
PT. #32  
B.M. ELEV. 717.02  
PK. NAIL IN CONCRETE WALL  
ALONG ALLEGHENY RIVER  
STA. L6020+44.55, 162.54' RIGHT  
STA. 12461.43, 35.81' LT.  
TENTH STREET BY-PASS W.B. (COMPUTED)

B.M. #1  
B.M. ELEV. 733.71  
SQUARE CUT IN N.E. CORNER  
CONCRETE CAP (PIER)  
STA. 311+04.12, 80.56' L  
MAZEROSKI WAY

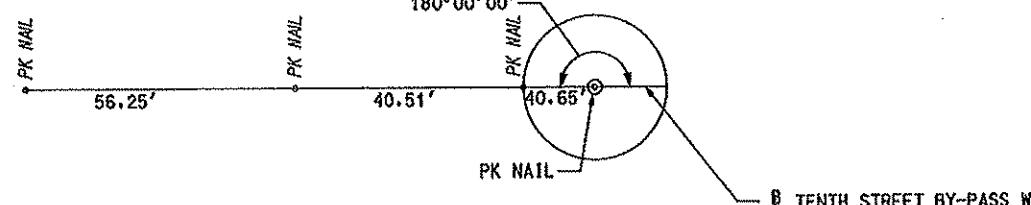
B.M. #2  
B.M. ELEV. 733.72  
SQUARE CUT IN S.E. CORNER  
CONCRETE CAP (PIER)  
STA. 202+23.12, 159.62' U  
REEDSDALE STREET



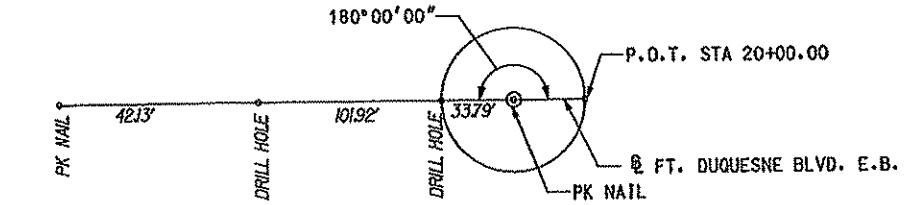
P.O.T. STA. 20+00.00  
FT. DUQUESNE BLVD. E.B.



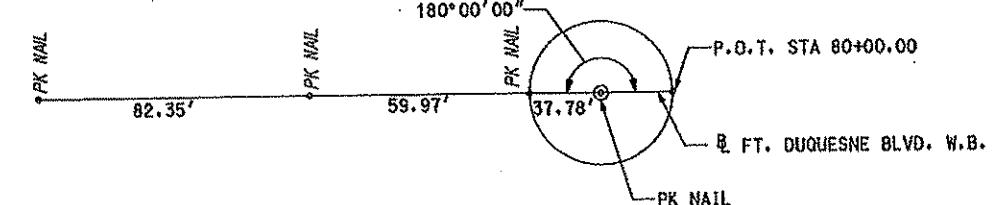
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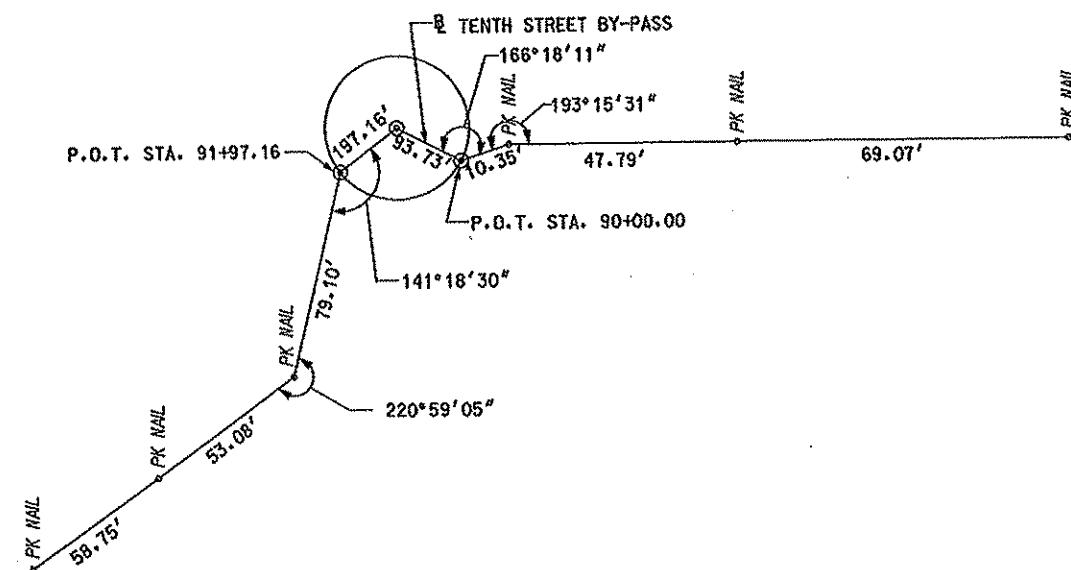
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TENTH STREET BY-PASS W.B.



P.O.T. STA. 21+97.21  
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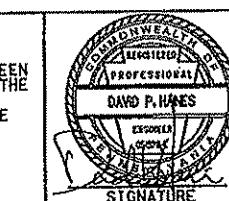


P.O.T. STA. 81+94.36  
FT. DUQUESNE BLVD. W.B.



P. I. STA. 90+93.73  
P.I. (NO CURVE)  
TENTH STREET BY-PASS E.B.  
S.R. 0279 RAMP

NO.	DATE	DESCRIPTION
		REVISIONS



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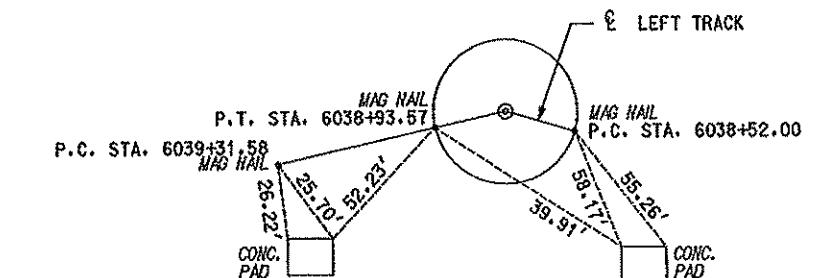
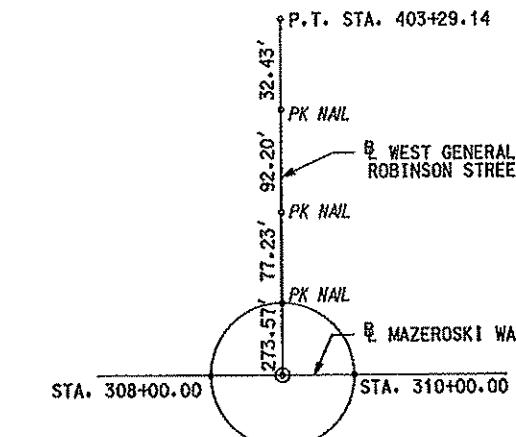
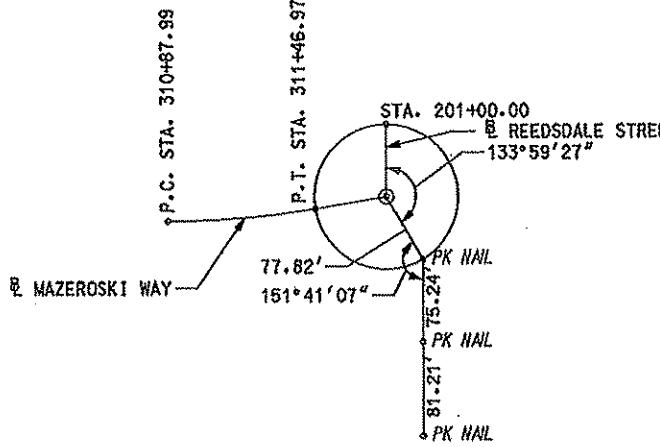
**DMJM HARRIS | AECOM**

*Dick DeGraw* APPROVED 4/28/08 DATE

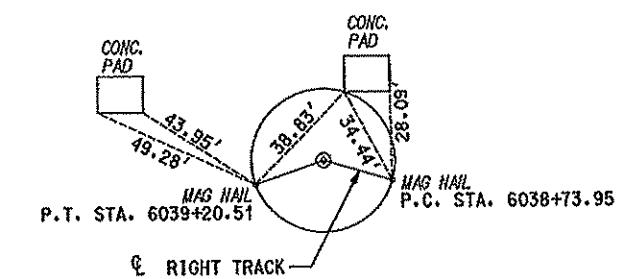
**PORT AUTHORITY OF ALLEGHENY COUNTY**

NORTH SHORE CONNECTOR  
NSC TRAIN SYSTEMS (SYSTEM WIDE)  
BENCHMARKS REFERENCE TIES  
SHEET 1 OF 2

	CONTRACT NO.	NSC-009
DWG NO.	GN403	SHT. 41

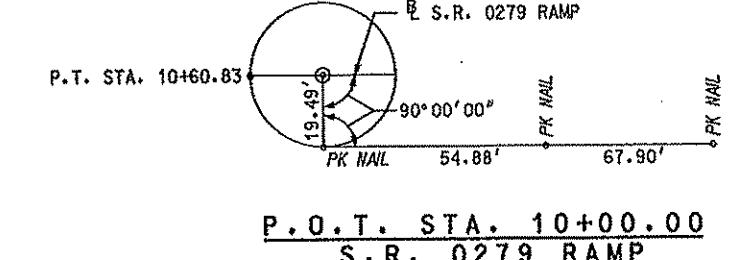
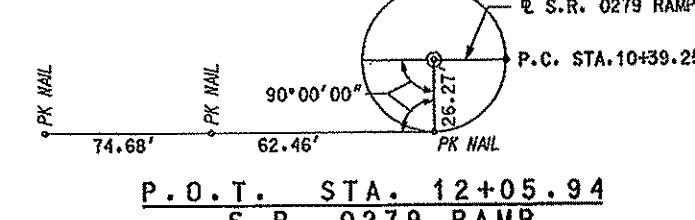
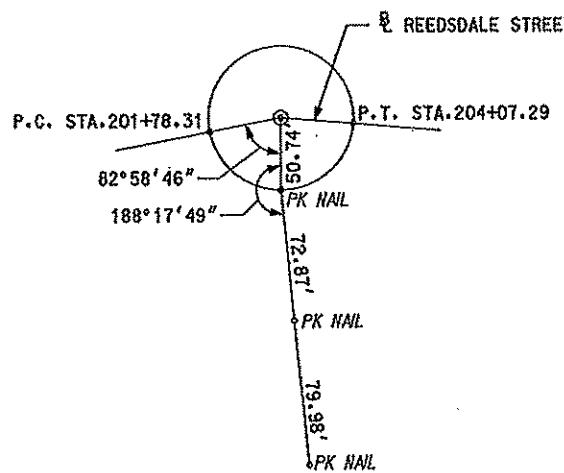


P.I. STA. 6038+72.83  
LEFT TRACK



P.I. STA. 6038+97.29  
RIGHT TRACK

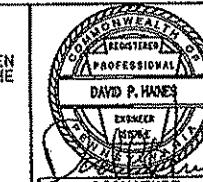
P.O.T. STA. 311+67.10 MAZEROSKI WAY =  
P.O.T. STA. 200+00.00 REEDSDALE STREET



P.I. STA. 202+93.35  
REEDSDALE STREET

NO.	DATE	DESCRIPTION	
		REVISIONS	

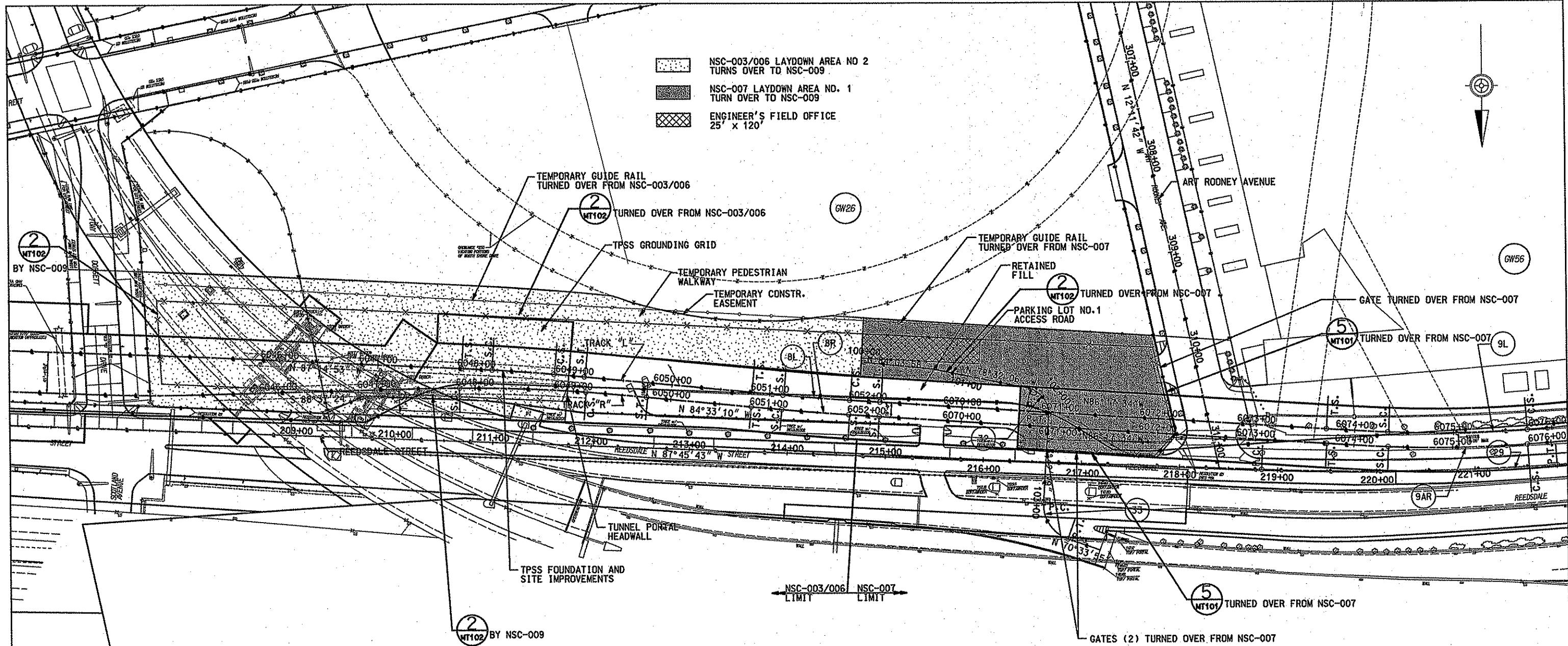
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DMJM HARRIS AECOM  
FOUR GATEWAY CENTER  
20TH FLOOR  
PITTSBURGH, PA. 15222  
APPROVED   
DATE 4/16/08

DESIGNED MLH  
DRAWN JMB  
CHECKED JAS  
IN CHARGE DPH  
DATE APRIL 28, 2008  
SCALE NTS  
NTS

PORT AUTHORITY OF ALLEGHENY COUNTY  
PITTSBURGH, PENNSYLVANIA  
NORTH SHORE CONNECTOR  
NSC TRAIN SYSTEMS (SYSTEM WIDE)  
BENCHMARKS REFERENCE TIES  
SHEET 2 OF 2  
Port Authority CONTRACT NO. NSC-009  
DWO. NO. GN404 SHT. 42



## **LEGEND**

**CURVE NUMBER**



**PARCEL IDENTIFICATION NUMBER (NO TAKE)**



**PARCEL IDENTIFICATION NUMBER (TAKE)**



- NOTES:

  1. FOR TRACK GEOMETRY SEE TKSERIES.
  2. FOR REEDSDALE ST. GEOMETRY SEE CV SERIES.
  3. NSC-003/006 AND NSC-007 HAS MADE DRIVEWAY, SIDEWALK, TUNNEL AND AERIAL STRUCTURE IMPROVEMENTS IN THE WORK AREA. DO NOT DAMAGE THESE AMENITIES. CONTRACTOR SHALL PROVIDE TEMPORARY PROTECTION FOR THESE NEWLY CONSTRUCTED FACILITIES.
  4. FOR RIGHT-OF-WAY INFORMATION SEE ALSO PLANS RW SERIES.
  5. SEE CV113 FOR PARKING LOT 1 TEMPORARY FACILITIES.
  6. TEMPORARY GUIDE RAIL TURNED OVER FROM NSC-003/006 AND NSC-007 SHALL BE REMOVED BY THE NSC-009 CONTRACTOR AT THE COMPLETION OF THE WORK.
  7. CONTRACTOR SHALL PROVIDE A SECURE LAYDOWN AREA IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

## LIST OF PROPERTY OWNERS

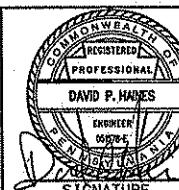
W26 — STADIUM AUTHORITY OF THE CITY  
OF PITTSBURGH



( ) — SPORTS AND EXHIBITION AUTHORITY  
OF PITTSBURGH AND ALLEGHENY COUNTY



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DMJM HARRIS | AECOM

FOUR GATEWAY CENTER  
20TH FLOOR  
PITTSBURGH, PA. 15222

Dad's 4/21/08

**PORT AUTHORITY OF ALLEGHENY COUNTY**  
PITTSBURGH, PENNSYLVANIA

#### **NORTH SHORE CONNECTOR**

**RSC TRAIN SYSTEMS (SYSTEM-WIDE)**

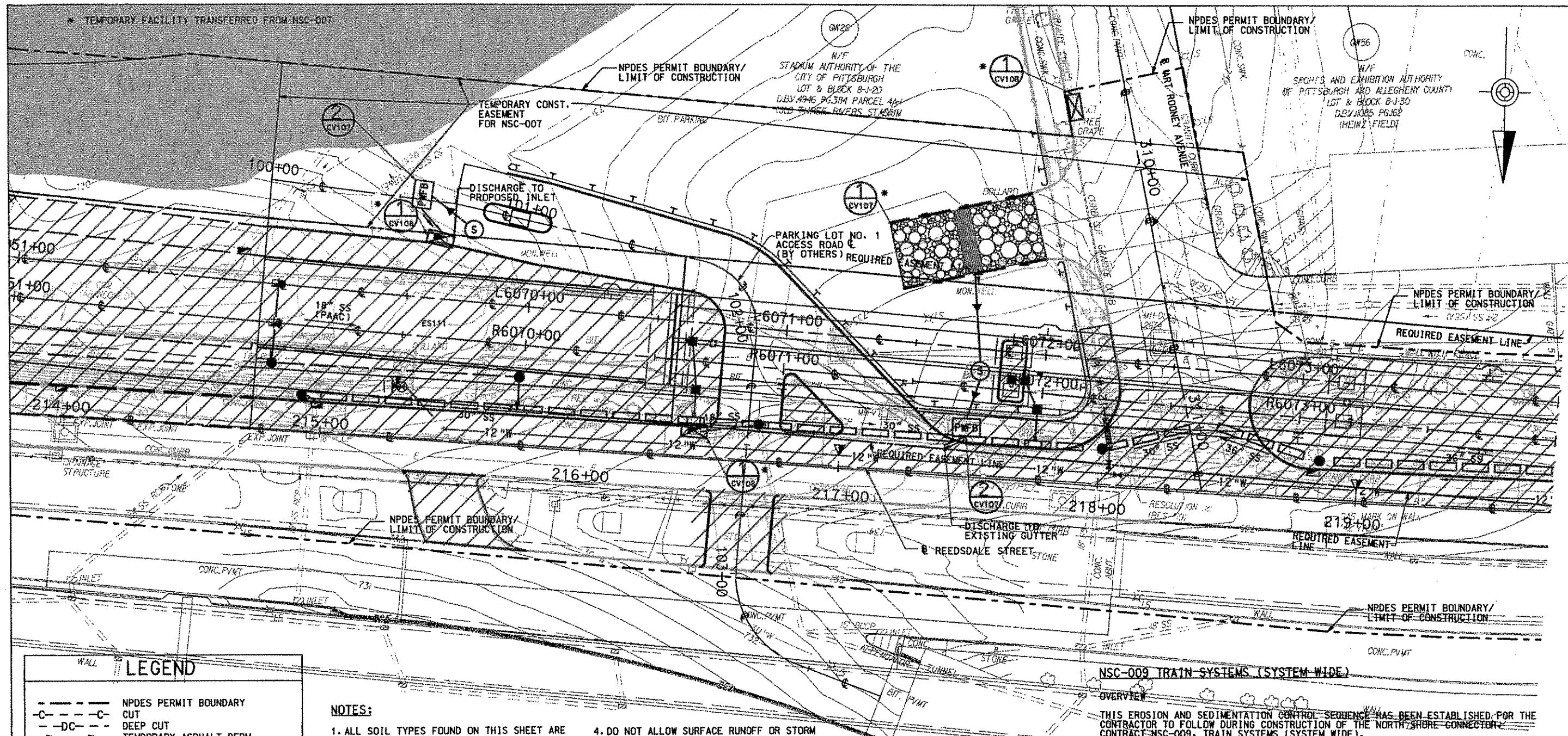
## **AYDOWN AREA PLAN**

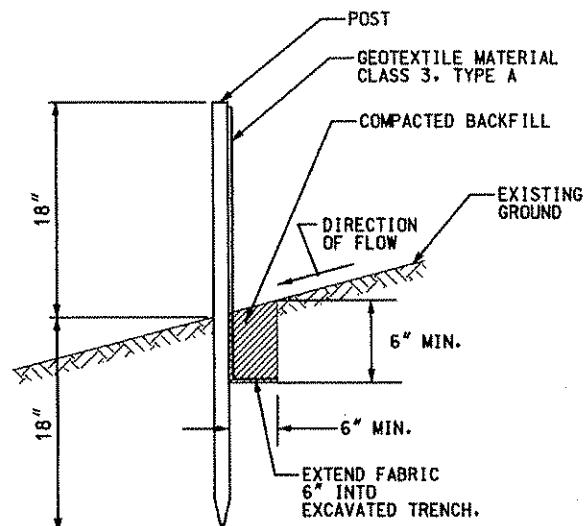
Authority

CONTRACT NO. NSC-069

DWG NO. GN405 SHEET 1

\* TEMPORARY FACILITY TRANSFERRED FROM NSC-007



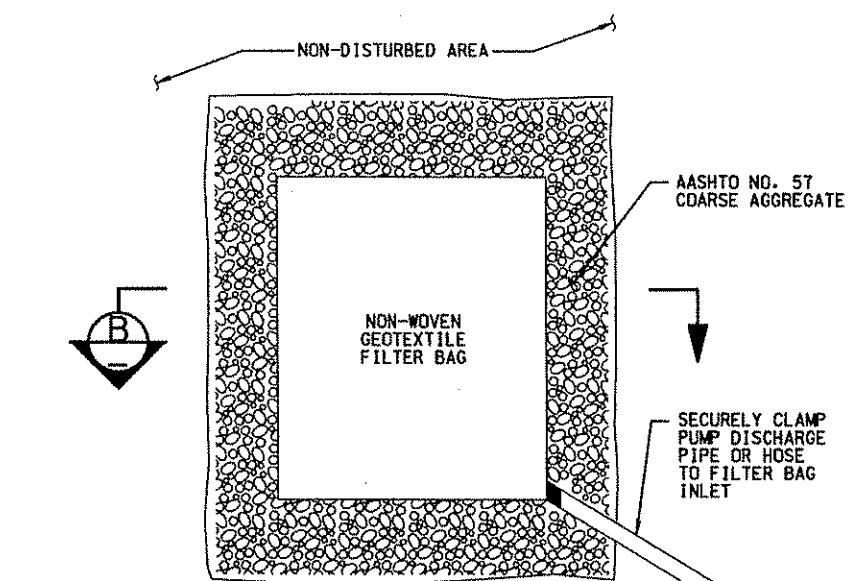


SILT BARRIER FENCE, 18" HEIGHT

(3) CV106

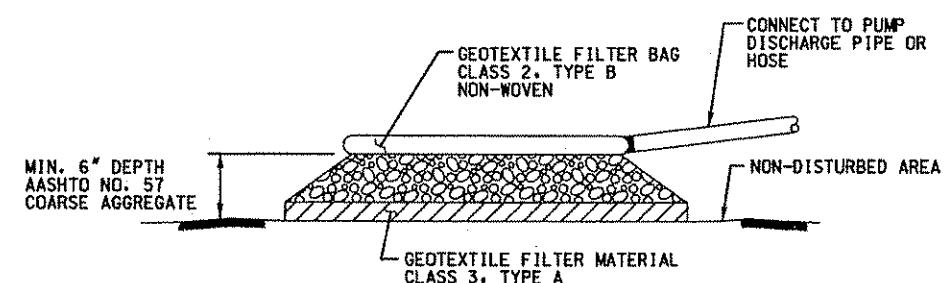
NOTES:

1. SILT FENCE IS NOT PERMITTED IN ANY AREA OF CONCENTRATED FLOWS SUCH AS DITCHES, SWALES OR CHANNELS.
2. SILT BARRIER FENCE MUST BE PLACED AT LEVEL EXISTING GRADE. BOTH ENDS OF THE BARRIER MUST BE EXTENDED AT LEAST 8 FEET UP SLOPE AT 45 DEGREES TO THE MAIN BARRIER ALIGNMENT.
3. FABRIC SHALL BE PLACED SO THAT IT EXTENDS INTO THE GROUND AT LEAST 6 INCHES.
4. SILT FENCES SHALL NOT BE PLACED IN ANY AREAS WHERE ROCK OR ROCKY SOIL PREVENTS THE FULL AND UNIFORM ANCHORING OF THE FENCE TOE.
5. STAKES SPACED @ 8' MAXIMUM. USE 2" X 2" WOOD OR EQUIVALENT STEEL STAKES.

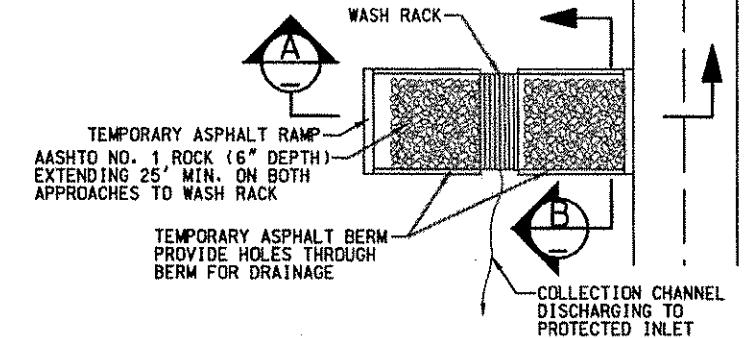


PUMPED WATER FILTER BAG DETAIL

(2) CV106

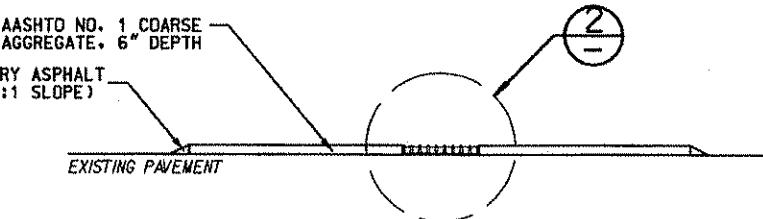


SECTION B

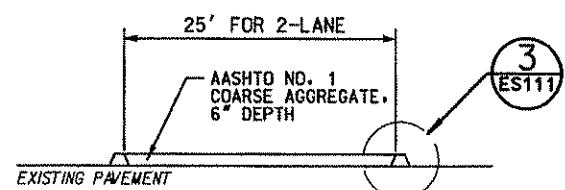


2-LANE ROCK CONSTRUCTION  
ENTRANCE W/ WASH RACK DETAIL  
(INSTALLED ON PAVEMENT)

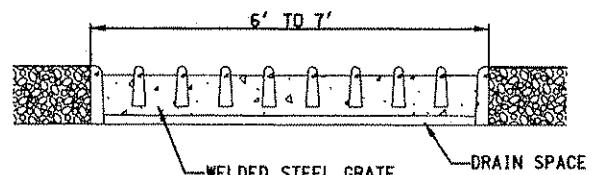
(1) CV106



SECTION A



SECTION B



WASH RACK DETAIL

(2) ES111



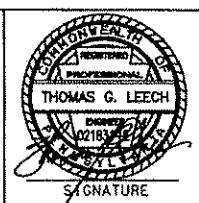
GANNETT FLEMING, INC.  
601 Holliday Drive  
Foster Plaza III  
Suite 200  
Pittsburgh, PA 15220

\*DATE\*

\*FILE\*

NO.	DATE	DESCRIPTION	REVISIONS
		DTK/WJB	

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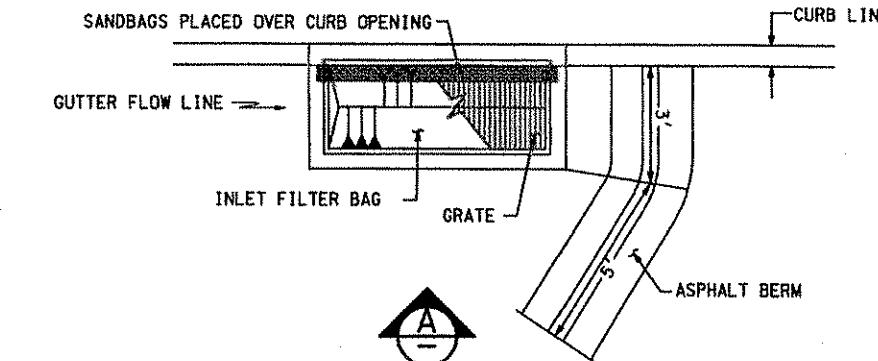
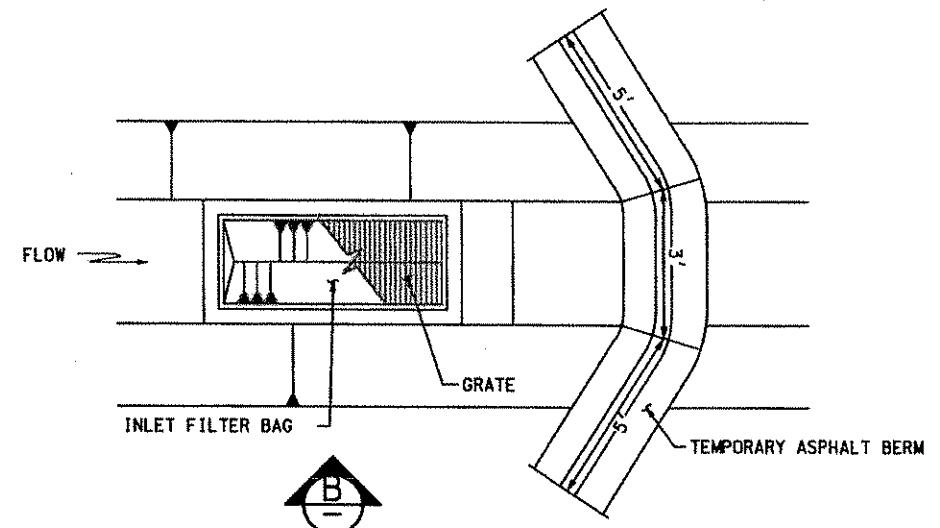
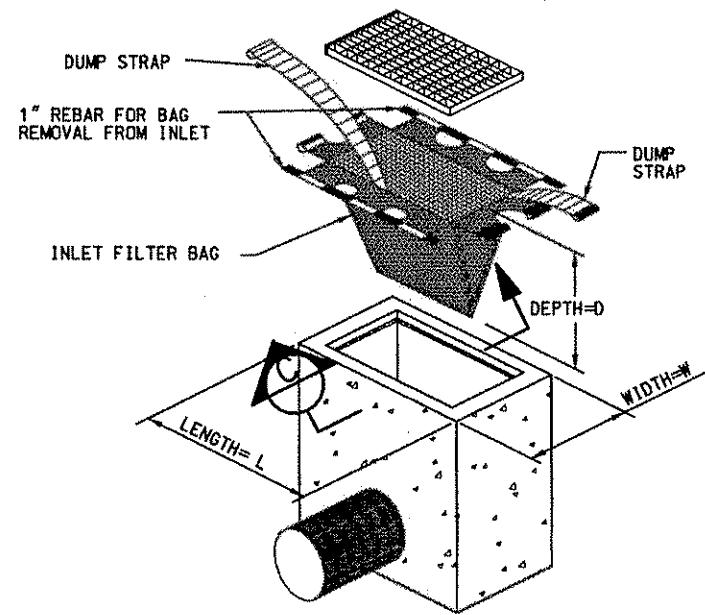


THOMAS G. LEECH  
PROFESSIONAL ENGINEER  
4/21/08  
SIGNATURE

DMJM HARRIS | AECOM  
FOUR GATEWAY CENTER  
20TH FLOOR  
PITTSBURGH, PA. 15222  
APPROVED  
4/21/08  
DATE

DESIGNED MAN  
DRAWN MAN  
CHECKED KCO  
IN CHARGE TGL  
DATE 4/21/08  
SCALE N.T.S.

**PORT AUTHORITY OF ALLEGHENY COUNTY**  
PITTSBURGH, PENNSYLVANIA  
NORTH SHORE CONNECTOR  
NSC TRAIN SYSTEMS (SYSTEM WIDE)  
EROSION & SEDIMENTATION CONTROL DETAILS  
SHEET 1 OF 2  
Port Authority  
CONTRACT NO. NSC-009  
DWG. NO. ES107  
SHT. 45



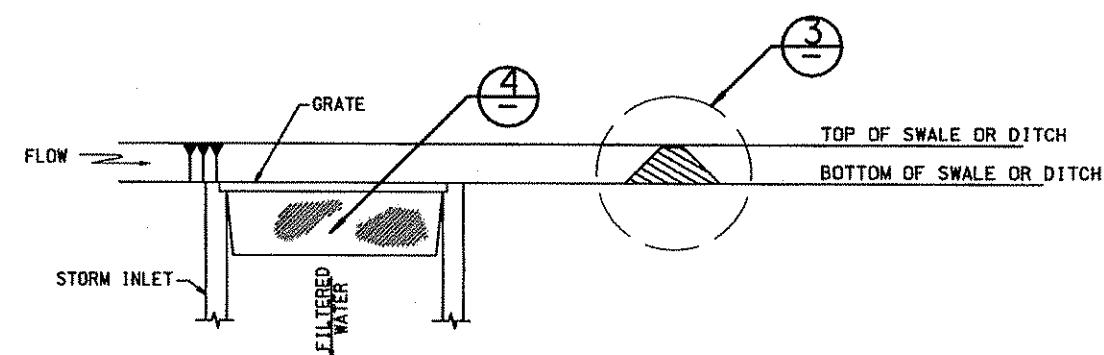
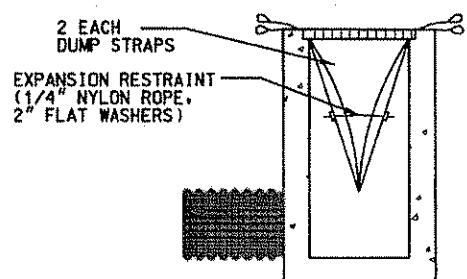
**SEDIMENT INLET PROTECTION DETAIL  
(SWALE OR DITCH)**

2

CV106

**INLET FILTER BAG DETAIL**

4  
CV106

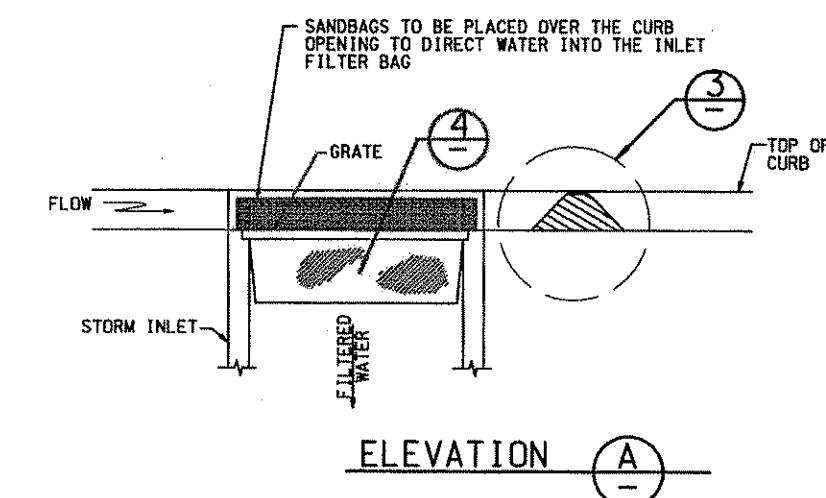


SECTION

C  
—

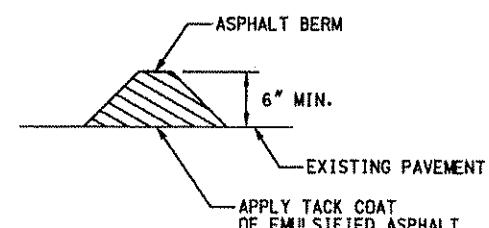
ELEVATION

B  
—



ELEVATION

A  
—



**TEMPORARY ASPHALT BERM DETAIL**

3  
—



GANNETT FLEMING, INC.  
800 Holiday Drive  
Suite 200  
Pittsburgh, PA 15220

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.

DTK/WJB

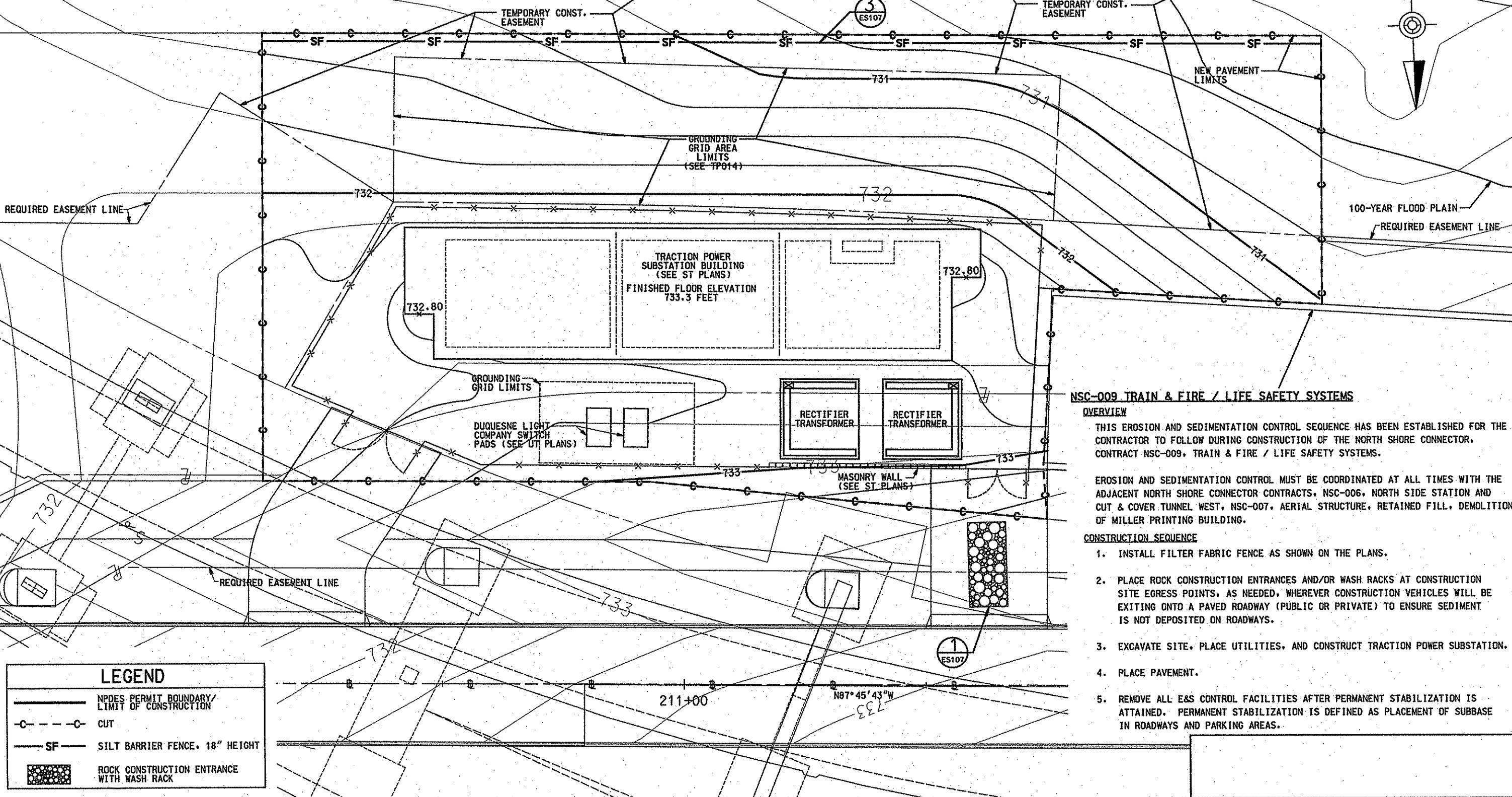


DMJM HARRIS | AECOM  
FOUR GATEWAY CENTER  
20TH FLOOR  
PITTSBURGH, PA. 15222  
Dated 4/21/08  
Signature  
APPROVED  
Date  
N.T.S.

PORT AUTHORITY OF ALLEGHENY COUNTY  
PITTSBURGH, PENNSYLVANIA  
NORTH SHORE CONNECTOR  
NSC TRAIN SYSTEMS (SYSTEM WIDE)  
EROSION & SEDIMENTATION CONTROL DETAILS  
SHEET 2 OF 2  
Port Authority  
CONTRACT NO. NSC-003  
DWG. NO. ES108  
SHEET 46

**NOTES:**  
1. ALL SOIL TYPES FOUND ON THIS SHEET ARE  
CLASSIFIED AS UB.

NPDES PERMIT BOUNDARY/  
LIMIT OF CONSTRUCTION



#### NSC-009 TRAIN & FIRE / LIFE SAFETY SYSTEMS

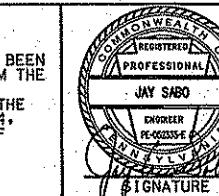
##### OVERVIEW

THIS EROSION AND SEDIMENTATION CONTROL SEQUENCE HAS BEEN ESTABLISHED FOR THE CONTRACTOR TO FOLLOW DURING CONSTRUCTION OF THE NORTH SHORE CONNECTOR. CONTRACT NSC-009, TRAIN & FIRE / LIFE SAFETY SYSTEMS.

EROSION AND SEDIMENTATION CONTROL MUST BE COORDINATED AT ALL TIMES WITH THE ADJACENT NORTH SHORE CONNECTOR CONTRACTS, NSC-006, NORTH SIDE STATION AND CUT & COVER TUNNEL WEST, NSC-007, AERIAL STRUCTURE, RETAINED FILL, DEMOLITION OF MILLER PRINTING BUILDING.

##### CONSTRUCTION SEQUENCE

1. INSTALL FILTER FABRIC FENCE AS SHOWN ON THE PLANS.
2. PLACE ROCK CONSTRUCTION ENTRANCES AND/OR WASH RACKS AT CONSTRUCTION SITE EGRESS POINTS, AS NEEDED, WHEREVER CONSTRUCTION VEHICLES WILL BE EXITING ONTO A PAVED ROADWAY (PUBLIC OR PRIVATE) TO ENSURE SEDIMENT IS NOT DEPOSITED ON ROADWAYS.
3. EXCAVATE SITE, PLACE UTILITIES, AND CONSTRUCT TRACTION POWER SUBSTATION.
4. PLACE PAVEMENT.
5. REMOVE ALL E&S CONTROL FACILITIES AFTER PERMANENT STABILIZATION IS ATTAINED. PERMANENT STABILIZATION IS DEFINED AS PLACEMENT OF SUBBASE IN ROADWAYS AND PARKING AREAS.



DMJM HARRIS | AECOM  
FOUR GATEWAY CENTER  
20TH FLOOR  
PITTSBURGH, PA. 15222  
APPROVED *D. L. Harris* DATE *4/21/08*

PORT AUTHORITY OF ALLEGHENY COUNTY  
PITTSBURGH, PENNSYLVANIA  
NORTH SHORE CONNECTOR  
NSC TRAIN SYSTEMS (SYSTEM WIDE)  
TRACTION POWER SUBSTATION  
EROSION & SEDIMENTATION CONTROL PLAN  
Port Authority  
CONTRACT NO. NSC-009  
DWG. NO. ES201 SHT. 47