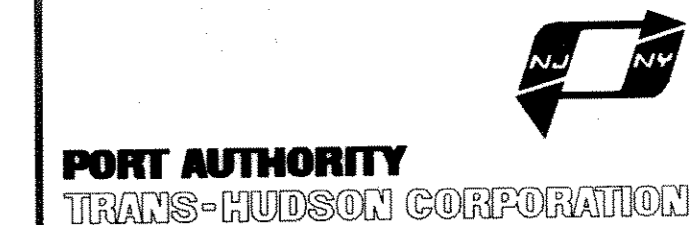


# STRUCTURAL NOTES



**GANNETT FLEMING, P.C.**  
ENGINEERS AND ARCHITECTS

*(Signature)*  
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## 1. GENERAL

### 1.1 CODES AND SPECIFICATIONS:

- a. NEW JERSEY UNIFORM CONSTRUCTION CODE (NJUCC)
- b. INTERNATIONAL BUILDING CODE (IBC) 2006, NEW JERSEY EDITION
- c. ASCE 7-05, MINIMUM BUILDING LOADS - AS APPLICABLE
- d. AISC MANUAL OF STEEL CONSTRUCTION ALLOWABLE STRESS DESIGN
- e. ACI 318-05, BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE AND COMMENTARY

### 1.2 DESIGN LOADS:

SNOW:	NOT APPLICABLE
RAIN ON SNOW:	NOT APPLICABLE
WIND LOAD:	NOT APPLICABLE
FLOOR DEAD LOADS:	SELFWEIGHT
LIVE LOAD:	
CONCOURSE LEVEL:	100 PSF
BUS LEVEL:	H2O LOADING + 30% IMPACT

1.3 TEMPORARY SUPPORT AND PROTECTION MAY BE REQUIRED FOR WORK ON OR NEAR EXISTING STRUCTURES TO BE MODIFIED UNDER THIS CONTRACT. THE CONTRACTOR SHALL SUBMIT CALCULATIONS FOR ALL SUCH SHORING, SHIELDING AND PROTECTION, WHICH SHALL BE IN ACCORDANCE WITH THE SAFETY PROVISIONS OF THE DIVISION I - GENERAL PROVISIONS, TO THE ENGINEER FOR REVIEW A MINIMUM OF THREE (3) WEEKS PRIOR TO SUCH WORK.

1.4 ALL DESIGN CALCULATIONS, INCLUDING SHORING, SHIELDING AND PROTECTION DESIGN, SHALL BE SIGNED AND STAMPED BY A LICENSED PROFESSIONAL ENGINEER, REGISTERED IN THE STATE OF NEW JERSEY.

1.5 VERIFY BY FIELD MEASUREMENT ALL DIMENSIONS AND ELEVATIONS OF EXISTING STRUCTURES THAT MAY BE REQUIRED TO LOCATE, ALIGN, DIMENSION AND DETAIL THE CONSTRUCTION WITHIN SPECIFIED TOLERANCES. THE FIELD MEASUREMENT SHALL BE PERFORMED PRIOR TO THE PREPARATION OF SHOP DRAWINGS AND THE MANUFACTURING, FABRICATION AND INSTALLATION OF ALL ITEMS OF CONSTRUCTION. ALL VARIATIONS FROM THE CONTRACT DRAWINGS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO THE PREPARATION OF SHOP DRAWINGS.

1.6 THE EXISTING PAINT COATINGS ON BEAMS, STRINGERS AND ALL STRUCTURAL SUPPORT STRUCTURES CONTAIN LEAD. CARE SHALL BE EXERCISED TO PREVENT PAINT COATINGS FROM BECOMING AIRBORNE. PRIOR TO PERFORMING ANY WORK THAT MAY CAUSE THE PAINT TO BECOME AIRBORNE (IE, WELDING, CUTTING, DRILLING, TORCHING, GRINDING, ETC.), REMOVE THE PAINT COATINGS IN ACCORDANCE WITH SPECIFICATION SECTION 02094, ENTITLED "WORKER AND ENVIRONMENTAL PROTECTION FOR LEAD-BASED PAINT REMOVAL".

## 2. CONCRETE

2.1 ALL CONCRETE FOR STRUCTURES SHALL BE AIR-ENTRAINED WITH A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI AT 28 DAYS WITH A MAXIMUM COARSE AGGREGATE OF 3/4" AND A MAXIMUM WATER CEMENT RATIO OF 0.45, UNLESS OTHERWISE NOTED. EXISTING CONCRETE IS ASSUMED TO BE 3000 PSI UNLESS OTHERWISE NOTED.

2.2 ALL STEEL REINFORCING BARS SHALL BE EPOXY COATED.

2.3 ALL WELDED WIRE FABRIC SHALL BE EPOXY COATED.

2.4 DETAIL FABRICATE AND ERECT REINFORCEMENT BARS, INCLUDING BAR SUPPORTS, SPACERS, ETC. IN ACCORDANCE WITH THE LATEST EDITION OF ACI 315.

2.5 CONCRETE COVER FOR REINFORCEMENT BARS SHALL CONFORM TO THE FOLLOWING, UNLESS INDICATED OTHERWISE ON THE DRAWINGS:

- A. INTERIOR EXPOSURE TOP AND BOTTOM OF SLABS ... 3/4 INCH
- B. TOP OF SLABS EXPOSED TO WATER/PRODUCT ... 1 1/2 INCHES

- C. SURFACES EXPOSED TO EARTH ... 2 INCHES
- D. CAST AGAINST EARTH ... 3 INCHES

2.6 REBAR COUPLERS SHALL BE INSTALLED AS PER MANUFACTURER'S RECOMMENDATIONS.

2.7 CORING OF SLAB FOR OPENINGS IS NOT PERMITTED WITHOUT PRIOR APPROVAL OF THE ENGINEER.

2.8 PROVIDE FORMED KEYED CONSTRUCTION JOINTS IN SLABS AS SHOWN ON DRAWINGS.

2.9 WATERSTOPS SHALL BE POLYVINYL CHLORIDE, 6" X 3/8" IN CONSTRUCTION JOINTS AS SHOWN ON DRAWINGS.

## 3. STEEL FORM DECK

3.1 STEEL FORM DECK SHALL BE HOT-DIPPED GALVANIZED.

3.2 MINIMUM SECTION PROPERTIES DETERMINED ASSUMING THAT ALL DECKS ARE NON-COMPOSITE AND SUPPORT THE WEIGHT OF THE CONCRETE DURING PLACEMENT AND A 20 PSF CONSTRUCTION LIVE LOAD. THE DECK SHALL BE 1 1/2 INCH DEEP WITH A THICKNESS OF 16 GAUGE.

3.3 THE STEEL DECK SHALL BE FASTENED TO SUPPORT MEMBER WITH 3/4" PUDDLE WELDS SPACED NO MORE THAN 12 INCHES ON CENTERS.

3.4 SIDE LAP SHALL BE FASTENED WITH SCREWS AT A MAXIMUM OF 2 FEET ON CENTER (MINIMUM OF 3 FASTENERS PER SPAN).

3.5 STEEL DECK SHALL HAVE A MINIMUM END BEARING OF 1.5 INCH. POUR STOPS SHALL HAVE A MINIMUM BEARING OF 2 INCHES.

## 4. STRUCTURAL STEEL

4.1 ALL STEEL FOR BUILDING STRUCTURES (BEAMS AND MISCELLANEOUS FRAMING MEMBERS) SHALL CONFORM TO A.S.T.M. A572 OR A992, GRADE 50, Fu=65 KSI UNLESS NOTED OTHERWISE.

4.2 STEEL PLATES SHALL CONFORM TO A.S.T.M. A36, Fy=36 KSI, Fu=58 KSI (MIN.).

4.3 ANCHOR RODS SHALL CONFORM TO THE FOLLOWING:  
A307, TENSILE STRENGTH = 60 KSI (MIN.)

4.4 DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL SHALL CONFORM TO THE LATEST A.I.S.C. CODES AND SPECIFICATIONS.

4.5 SHOP CONNECTIONS SHALL BE MADE WITH 3/4 INCH DIAMETER HIGH-STRENGTH BOLTS OR WELDING E70XX. FIELD CONNECTIONS SHALL BE MADE WITH 3/4" DIAMETER, A325 HIGH-STRENGTH BOLTS, EXCEPT WHERE FIELD WELDING IS INDICATED ON THE DRAWINGS.

4.6 BOLTED CONNECTIONS SHALL CONTAIN A MINIMUM OF TWO 3/4" A325 BOLTS UNLESS NOTED OTHERWISE. BOLTS SHALL BE SPACED AS FOLLOWS:

- A. CENTER TO CENTER OF BOLTS ... 3 INCHES
- B. TO EDGE OF SHEARED MEMBERS ... 1 1/2 INCHES

4.7 ALL WELD SIZES NOT INDICATED ON THE DRAWINGS SHALL COMPLY WITH THE LATEST A.W.S. D1.1 BUT IN NO CASE SHALL THE WELD BE LESS THAN 3/16 INCH. ALL WELDS TO BE PERFORMED BY CERTIFIED WELDER.

4.8 USE NON-SHRINK, NON-METALLIC GROUT CONFORMING TO ASTM C1107 BELOW BASE PLATES.

4.9 DO NOT USE STRUCTURAL STEEL MEMBERS AS LIFT BEAMS.

4.10 TEMPORARY BRACING SHALL BE PROVIDED DURING CONSTRUCTION.

4.11 MINIMUM THICKNESS OF STRUCTURAL STEEL SHALL BE 1/4 INCH NOMINAL (0.23 INCH ACTUAL).

4.12 ALL STEEL TO BE FIREPROOFED AS PER SPECIFICATION 07255.

## 5. REMOVAL NOTES

5.1 PROVIDE AND MAINTAIN ALL NECESSARY TEMPORARY PROTECTION FOR EXISTING CONSTRUCTION, EQUIPMENT AS WELL AS EMPLOYEE AND USER SAFETY, AS PER OSHA.

5.2 DESIGN AND FURNISH ALL REQUIRED SHORING TO PREVENT ANY COLLAPSE OF THE STRUCTURE.

5.3 DO NOT PERMIT DEBRIS OR SALVAGE MATERIALS TO ACCUMULATE ON THE FLOORS BY REMOVING DAILY.

5.4 PROVIDE PLYWOOD OR PLANKING CUSHION AND PROTECT FLOORS AGAINST MARRING OR DAMAGE. REPAIR OR REPLACE MARRED OR DAMAGED FLOORING AT NO ADDITIONAL COST TO THE PATH.

5.5 ANY QUESTIONABLE CONDITION SHOULD BE BROUGHT TO THE ATTENTION OF THE ENGINEER FOR CLARIFICATION.

5.6 THE WORDS "REMOVE" AND "TO BE REMOVED" ON THE CONTRACT DRAWINGS MEAN THAT THE ITEM INDICATED SHALL BE REMOVED BY THE CONTRACTOR UNDER THE WORK OF THIS CONTRACT.

5.7 FURNISH A PROTECTION PLAN TO THE ENGINEER INDICATING THE CONTRACTOR'S METHODS FOR PROTECTION OF EXISTING STRUCTURE.

5.8 CONTRACTOR SHALL PROVIDE WATER CONTROL DURING EXCAVATION OF SUMP PITS.

## 6. EXCAVATION, SHORING AND BACKFILL

6.1 EXCAVATION FOR SUMP PITS AND UPPER LANDINGS REQUIRES BRACED EXCAVATIONS. SEE SPECIFICATION 02221 FOR REQUIREMENTS.

6.2 EXCAVATED MATERIAL (EXCEPT ROCK EXCAVATION) IS SUITABLE AS FILL MATERIAL. EXCAVATED MATERIAL NOT USED AS FILL IS TO BE HAULED OFF SITE.

6.3 ROCK EXCAVATION IS ANTICIPATED. SEE STRUCTURAL DRAWINGS FOR REMOVAL LIMITS.

6.4 EXCAVATION AT THE SUMP PITS AND UPPER LANDINGS REQUIRES REMOVALS BY HAND.

WELDED PLATE GIRDER DIMENSIONS

WELDED PLATE GIRDER	DEPTH (IN.)	FLANGE		WEB		LOCATION	REMARKS
		WIDTH (IN.)	THICK (IN.)	WIDTH (IN.)	THICK (IN.)		
WPG-4	144	16	4	136	1 1/2	BUS LEVEL	BOX GIRDER
WPG-12A	142	16	7 1/2	127	2	BUS LEVEL	T.O. STEEL 390'-0 1/2"
WPG-12B	144	VARIABLES	8 1/2	127	2	BUS LEVEL	T.O. STEEL 390'-1 1/2"
WPG-12C	139	VARIABLES	6	127	2	BUS LEVEL	T.O. STEEL 389'-11"
WPG-49	72	24	3	66	1	CONCOURSE LEVEL	T.O. STEEL 374'-6"
WPG-51A	54	20	1 1/2	51	1/2	CONCOURSE LEVEL	T.O. STEEL 374'-6"

REINFORCEMENT SPLICE AND EMBEDMENT

BAR SIZE	MINIMUM LAP SPLICE (IN.)		MINIMUM EMBEDMENT LENGTH (IN.)	
	TOP BARS	BOTTOM BARS	TOP BARS	BOTTOM BARS
3	19	17	15	13
4	26	23	20	18
5	38	34	29	26
6	52	46	40	35
7	56	49	43	38
8	63	56	49	43
9	79	69	61	53

## 7. STAGING NOTES

7.1 FOR WORK PROCEDURES SEE GENERAL SEQUENCE OF CONSTRUCTION ON DWG. G004.

7.2 THE CONTRACTOR SHALL COORDINATE WORK AND COMPLY WITH CONRAIL'S REQUIREMENTS, AS PER REFERENCE DOCUMENT CE-6 REV. 2-97 ENTITLED, "SPECIFIC REQUIREMENTS OF CONSOLIDATED RAIL CORPORATION FOR WORK ON ITS RIGHT OF WAY", WHICH INCLUDES REQUIREMENTS FOR DEMOLITION AND ERECTION OVER THE CONRAIL'S TRACKS. THE CONTRACTOR SHALL SUBMIT TO CONRAIL FOR REVIEW AND APPROVAL THE SITE-SPECIFIC WORK PLAN FOR CONSTRUCTION WORK OVER CONRAIL. THE PLAN SHALL INCLUDE COMPLETE DETAILS INDICATING HOW THE CONTRACTOR WILL ACCESS THE WORK AREA AT TRACK ELEVATION WITH MEN, MATERIAL AND EQUIPMENT.

## LEGEND

- (290'-6") TOP OF STEEL ELEVATION
- ← DIRECTION OF DECK CORRUGATION OR SLAB SUPPORT SYSTEM
- W24X76 BEAM DESIGNATION
- WPG-4 WELDED PLATE GIRDER DESIGNATION
- [ ] COLUMNS ABOVE LEVEL SHOWN
- [ ] COLUMNS BELOW LEVEL SHOWN
- φ DIAMETER

FEATURE	SYMBOL
REMOVALS	
CONCRETE	
TIMBER	
EARTH	
CRUSHED STONE	
ROCK	

## DRAWING CONVENTIONS

- SECTION (S) OR ELEVATION (E) VIEW INDICATOR
- SECTION OR ELEVATION VIEW IDENTIFICATION
- DRAWING NUMBER WHERE VIEW APPEARS. DASH (-) INDICATES VIEW APPEARS ON THE SAME DRAWING
- DETAIL (D) VIEW INDICATOR
- DETAIL VIEW IDENTIFICATION
- DRAWING NUMBER WHERE VIEW APPEARS. DASH (-) INDICATES VIEW APPEARS ON THE SAME DRAWING
- SECTION (S), ELEVATION (E), OR DETAIL (D), VIEW INDICATOR
- SECTION, ELEVATION, OR DETAIL VIEW IDENTIFICATION
- SECTION, ELEVATION, OR DETAIL TITLE
- DRAWING NUMBER WHERE VIEW IS TAKEN, DASH (-) INDICATES VIEW IS TAKEN ON THE SAME DRAWING
- CONCOURSE LEVEL ← FLOOR LEVEL

## ABBREVIATIONS

A.B. APPROX.	ANCHOR BOLT	R	PLATE REQUIRED
B.O. BOTTOM OF BUILDING LINE	APPROXIMATE	REQ'D.	SIMILAR
B.L. CENTERLINE	BOTTOM OF BUILDING LINE	SIM.	SPACES
CLR. CLEAR	CLEAR	S.S.	STAINLESS STEEL
DWG. DRAWING	DRAWING	T.O.	TOP OF
DIA. DIAMETER	DIA.	T.O.S.	TOP OF STEEL
EL./ELEV. ELEVATION	ELEVATION	T.O.C.	TOP OF CONCRETE
MIN. MINIMUM	MINIMUM	TYP.	TYPICAL
N.T.S. NOT TO SCALE	NOT TO SCALE	U.N.O.	UNLESS NOTED OTHERWISE
O.A.E. OR APPROVED EQUAL	OR APPROVED EQUAL	V.I.F.	VERIFY IN FIELD
O.C. ON CENTER	ON CENTER	W/	WITH
OPP. OPPOSITE	OPPOSITE	W.P.	WORKPOINT

No.	Date	Revision	Approved

ENGINEERING DEPARTMENT			
JOURNAL SQUARE			
TRANSPORTATION CENTER			

### STRUCTURAL

Title **BUS TERMINAL ESCALATOR REPLACEMENT**

**STRUCTURAL NOTES, LEGEND AND ABBREVIATIONS**

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J. Villa	J. Villa	R. Acoury
Designed by	Drawn by	Checked by
Date	11/17/2008	
Contract Number	PAT-214.004	
Drawing Number	<b>S001</b>	
	PID# 07957000	