

# WHITE FLINT METRORAIL STATION NORTH ENTRANCE FEASIBILITY STUDY Final Report - Appendices

Montgomery County, Maryland  
November 2019



Washington Metropolitan Area Transit Authority

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## Appendix A:

### Architectural Design Drawings

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# WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY



## WHITE FLINT STATION - NEW NORTH ENTRANCE

STRUCTURAL ALTERNATIVES

DRAFT

02/27/2019

**KGP** design studio

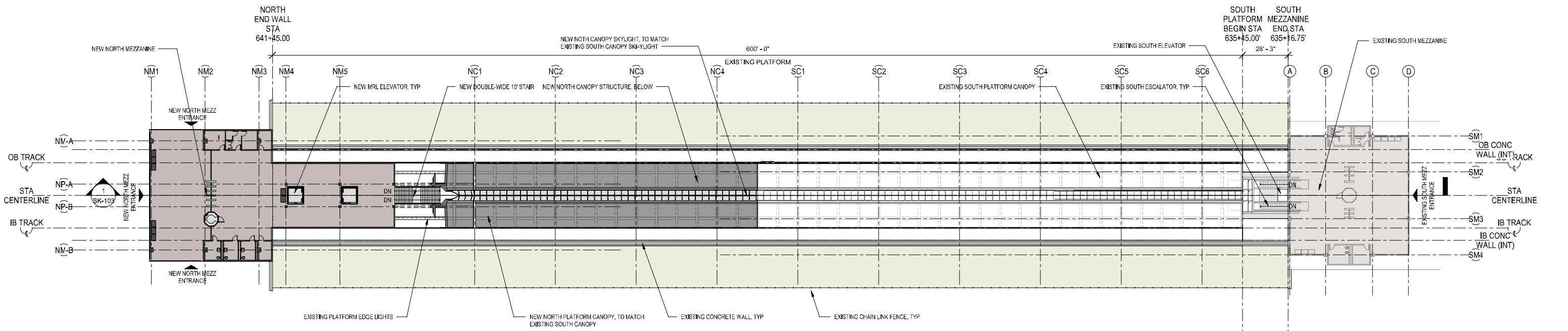
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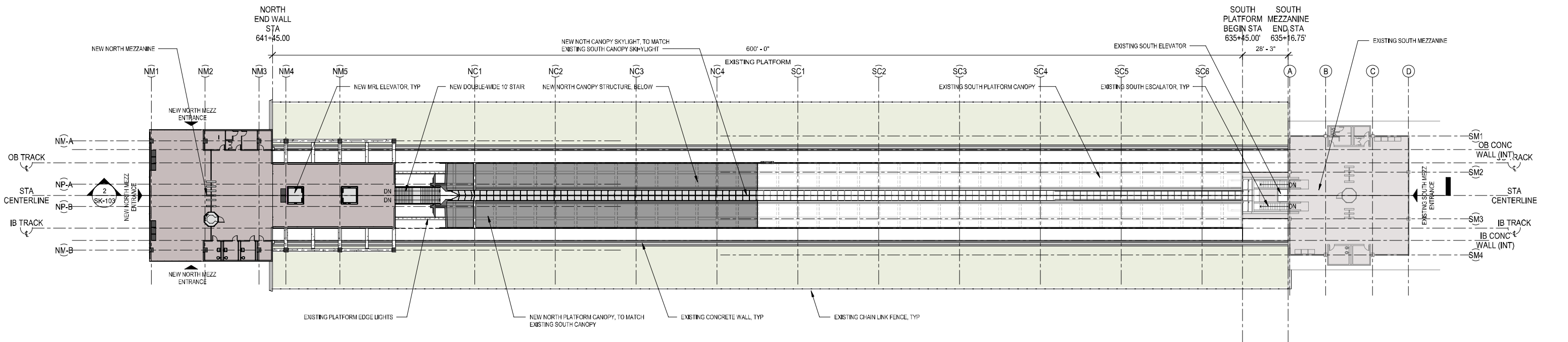
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SHEET NUMBER	SHEET NAME	SHEET ISSUE DATE
SK-000	COVER SHEET	02/27/19
SK-001	SHEET INDEX	02/27/19
SK-101	OVERALL MEZZANINE PLAN	02/27/19
SK-102	OVERALL ROOF PLAN	02/27/19
SK-103	OVERALL LONGITUDINAL SECTIONS	02/27/19
SK-104	EXISTING NORTH SERVICE ROOMS - PLATFORM LEVEL	02/27/19
SK-105	NEW NORTH ENTRANCE - PLATFORM LEVEL - STRUCT ALT-1	02/27/19
SK-106	NEW NORTH ENTRANCE - PLATFORM LEVEL - STRUCT ALT-2	02/27/19
SK-107	NEW NORTH ENTRANCE - MEZZANINE LEVEL - STRUCT ALT-1	02/27/19
SK-108	NEW NORTH ENTRANCE - MEZZANINE LEVEL - STRUCT ALT-2	02/27/19
SK-109	NEW NORTH ENTRANCE - ROOF LEVEL - STRUCT ALT-1	02/27/19
SK-110	NEW NORTH ENTRANCE - ROOF LEVEL - STRUCT ALT-2	02/27/19
SK-111	SECTIONS - EXISTING CONDITION	02/27/19
SK-112	SECTIONS- NEW DESIGN - STRUCT ALT-1	02/27/19
SK-113	SECTIONS- NEW DESIGN - STRUCT ALT-2	02/27/19
SK-S01	NORTH MEZZANINE ROOF FRAMING PLANS	02/27/19
SK-S02	NORTH MEZZANINE ROOF FRAMING PLAN - ALT 1	02/27/19
SK-S03	NORTH MEZZANINE ROOF FRAMING PLAN - ALT 2	02/27/19
SK-S04	EXISTING SOUTH MEZZANINE ROOF FRAMING PLAN	02/27/19



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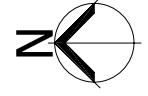
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SK-101  
OVERALL MEZZANINE PLAN STRUCT ALT-1  
SCALE: 1" = 30'-0"

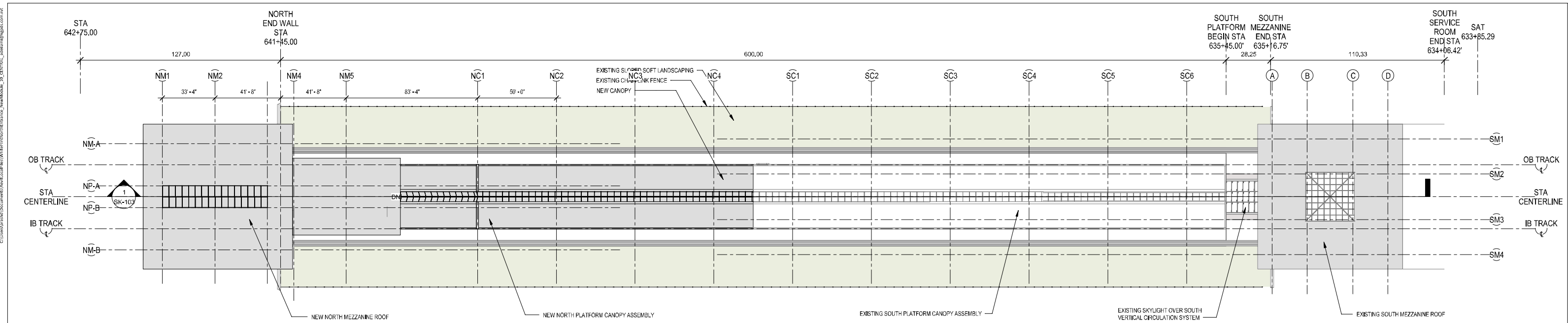


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SK-101  
OVERALL MEZZANINE PLAN STRUCT ALT-2  
SCALE: 1" = 30'-0"

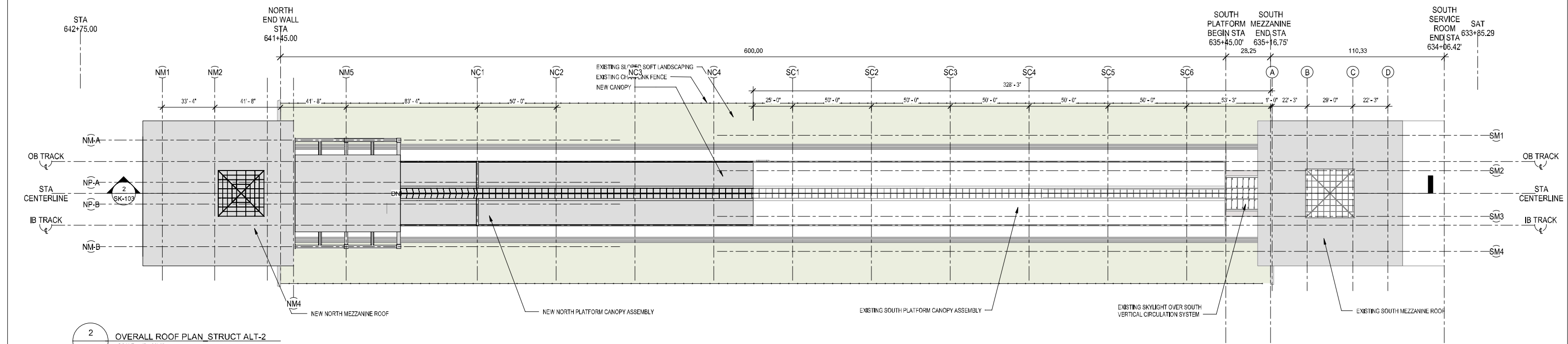
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- |   |                        |   |                            |
|---|------------------------|---|----------------------------|
|  | EXISTING BUILDING      |  | NEW NORTH MEZZANINE GRID   |
|  | NEW CONSTRUCTION       |  | NEW NORTH PLATFORM GRID    |
|  | EXISTING SOFTLANDSCAPE |  | NEW NORTH CANOPY GRID      |
|   |                        |  | SOUTH EXISTING CANOPY GRID |












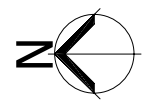
**1** OVERALL ROOF PLAN\_STRUCT ALT-1  
 SK-102 SCALE: 1" = 30'-0"  
 15' 0' 15' 30'



**2** OVERALL ROOF PLAN\_STRUCT ALT-2  
 SK-102 SCALE: 1" = 30'-0"  
 15' 0' 15' 30'

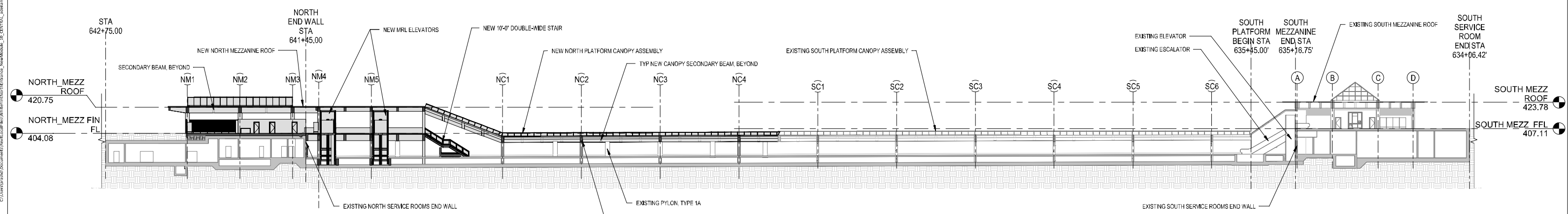
**LEGEND:**

- |   |                        |   |                            |
|---|------------------------|---|----------------------------|
|  | EXISTING BUILDING      |  | NEW NORTH MEZZANINE GRID   |
|  | NEW CONSTRUCTION       |  | NEW NORTH PLATFORM GRID    |
|  | EXISTING SOFTLANDSCAPE |  | NEW NORTH CANOPY GRID      |
|   |                        |  | SOUTH EXISTING CANOPY GRID |

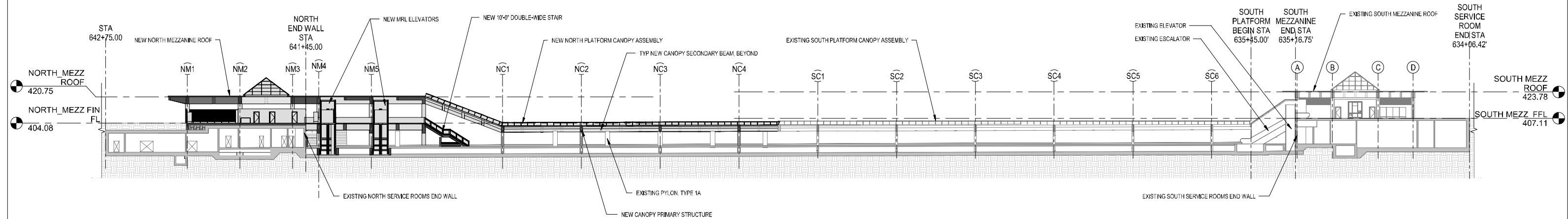




C:\Users\jacob\Documents\White Flint Station - New North Entrance - New Mezzanines - 10 - Overall Longitudinal Sections - SK-103.dwg

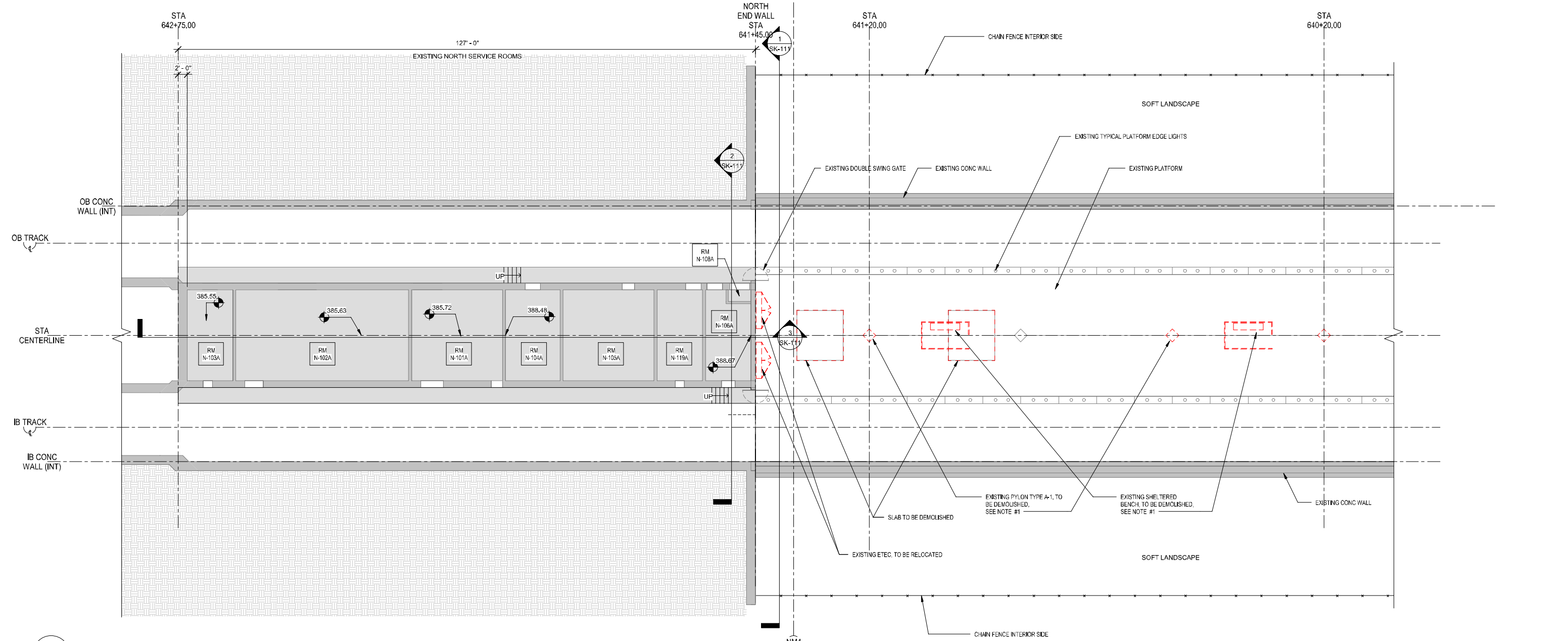


1 OVERALL LONGITUDINAL SECTION, STRUCT ALT-1  
 SK-103 SCALE: 1" = 30'-0"



2 OVERALL LONGITUDINAL SECTION, STRUCT ALT-2  
 SK-103 SCALE: 1" = 30'-0"

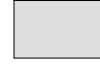







C:\Users\jand\Documents\Drawings\White Flint Station\New North Entrance\New North Entrance - Platform Level - SK-104.dwg



1  
SK-104  
EXISTING NORTH SERVICE ROOMS - PLATFORM LEVEL  
SCALE: 3/32" = 1'-0"  
0 5' 10' 20'

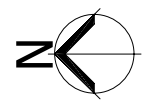
EXISTING ROOM SCHEDULE- NORTH	
ROOM NUMBER	ROOM NAME
N-101A	EXISTING MECHANICAL ROOM
N-102A	EXISTING NORTH AC SWITCHBOARD ROOM
N-103A	EXISTING NORTH BATTERY ROOM
N-104A	EXISTING NORTH COMMUNICATIONS ROOM
N-105A	EXISTING TRAIN CONTROL ROOM
N-106A	EXISTING NORTH OPERATIONS ROOM
N-108A	EXISTING NORTH FEC
N-119A	EXISTING NORTH MAINTENANCE ROOM

**LEGEND:**

-  EXISTING BUILDING
-  NEW CONSTRUCTION
-  NEW NORTH MEZZANINE GRID
-  NEW NORTH PLATFORM GRID
-  NEW NORTH CANOPY GRID
-  SOUTH EXISTING CANOPY GRID
-  EXISTING TO BE DEMOLISHED
-  EXISTING TO BE DEMOLISHED

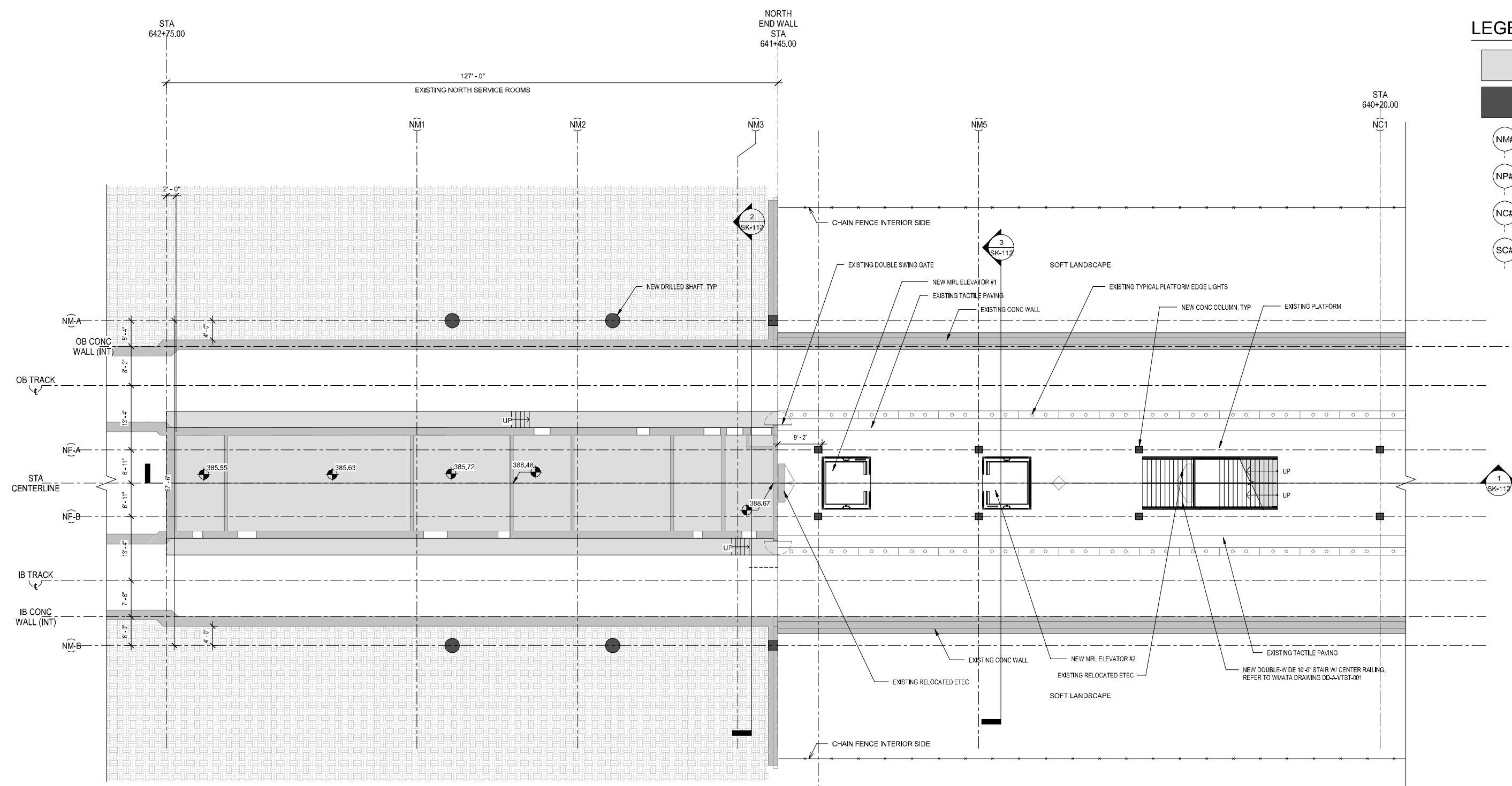
**SHEET NOTES:**

1. LOCATION OF PLATFORM FURNITURE AND EQUIPMENT TO BE VERIFIED IN FIELD.
2. SEE SHEET A14-S-21 & S-23 FROM WMATA AS-BUILT DRAWINGS FOR MORE INFORMATION.



**LEGEND:**

- EXISTING BUILDING
- NEW CONSTRUCTION
- NM# NEW NORTH MEZZANINE GRID
- NP# NEW NORTH PLATFORM GRID
- NC# NEW NORTH CANOPY GRID
- SC# SOUTH EXISTING CANOPY GRID



**1**  
SK-105  
NEW NORTH ENTRANCE - PLATFORM LEVEL  
SCALE: 3/32" = 1'-0"

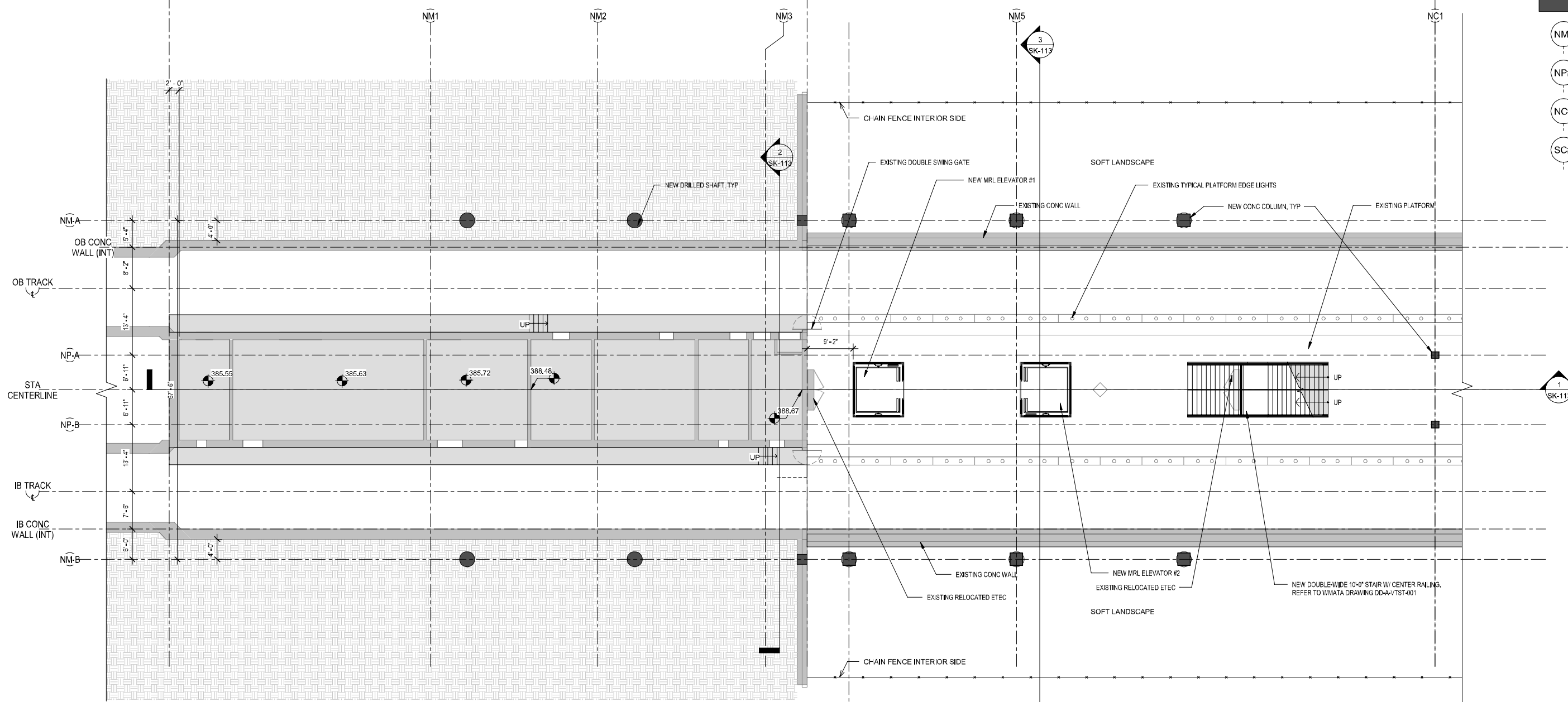
EXISTING ROOM SCHEDULE - NORTH	
ROOM NUMBER	ROOM NAME
N-101A	EXISTING MECHANICAL ROOM
N-102A	EXISTING NORTH AC SWITCHBOARD ROOM
N-103A	EXISTING NORTH BATTERY ROOM
N-104A	EXISTING NORTH COMMUNICATIONS ROOM
N-105A	EXISTING TRAIN CONTROL ROOM
N-106A	EXISTING NORTH OPERATIONS ROOM
N-108A	EXISTING NORTH FEC
N-119A	EXISTING NORTH MAINTENANCE ROOM

C:\Users\james\Documents\White Flint Station\White Flint Station - New North Entrance - Struct Alt-2 - Platform Level - SK-106.dwg

STA 642+75.00  
 127'-0"  
 EXISTING NORTH SERVICE ROOMS  
 NORTH END WALL STA 641+45.00

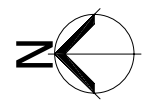
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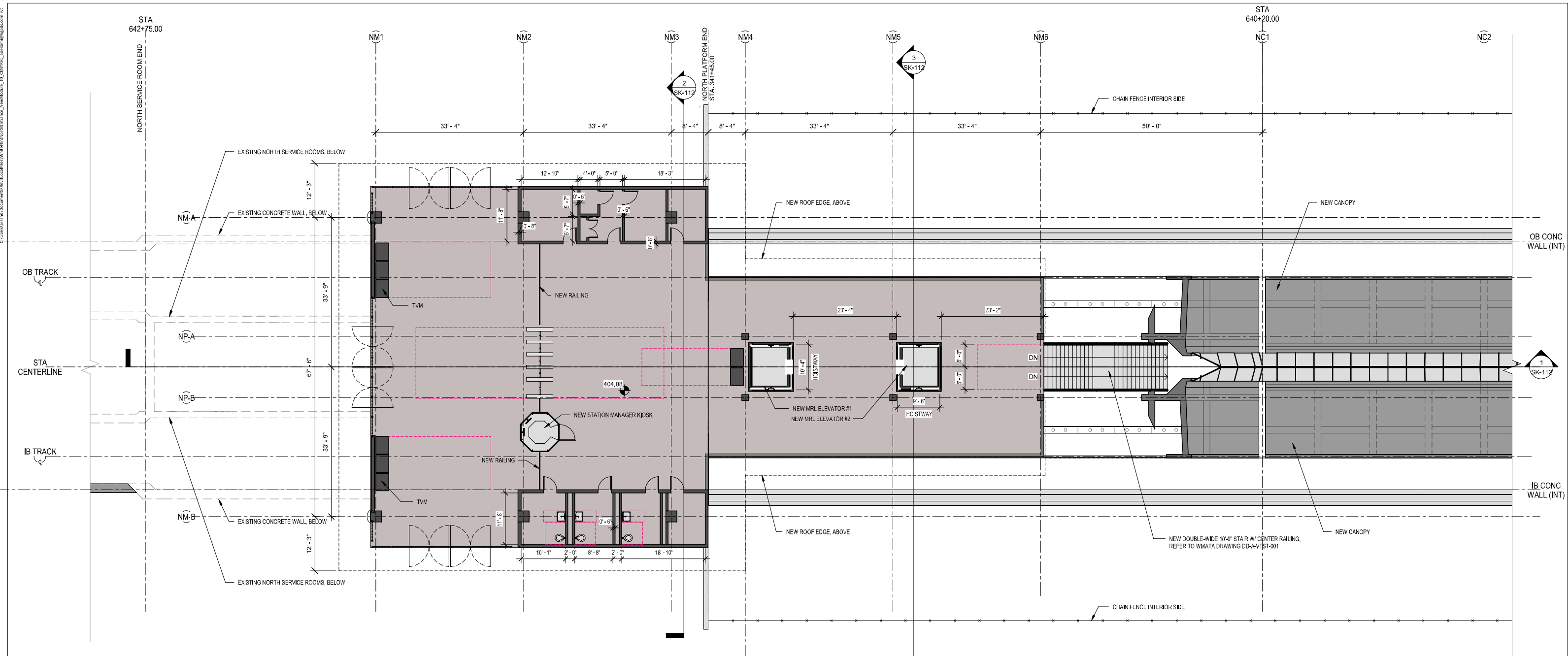
- EXISTING BUILDING
- NEW CONSTRUCTION
- NM# NEW NORTH MEZZANINE GRID
- NP# NEW NORTH PLATFORM GRID
- NC# NEW NORTH CANOPY GRID
- SC# SOUTH EXISTING CANOPY GRID



1  
 SK-106  
 NEW NORTH ENTRANCE - PLATFORM LEVEL  
 SCALE: 3/32" = 1'-0"

EXISTING ROOM SCHEDULE- NORTH	
ROOM NUMBER	ROOM NAME
N-101A	EXISTING MECHANICAL ROOM
N-102A	EXISTING NORTH AC SWITCHBOARD ROOM
N-103A	EXISTING NORTH BATTERY ROOM
N-104A	EXISTING NORTH COMMUNICATIONS ROOM
N-105A	EXISTING TRAIN CONTROL ROOM
N-106A	EXISTING NORTH OPERATIONS ROOM
N-108A	EXISTING NORTH FEC
N-119A	EXISTING NORTH MAINTENANCE ROOM

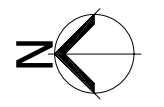


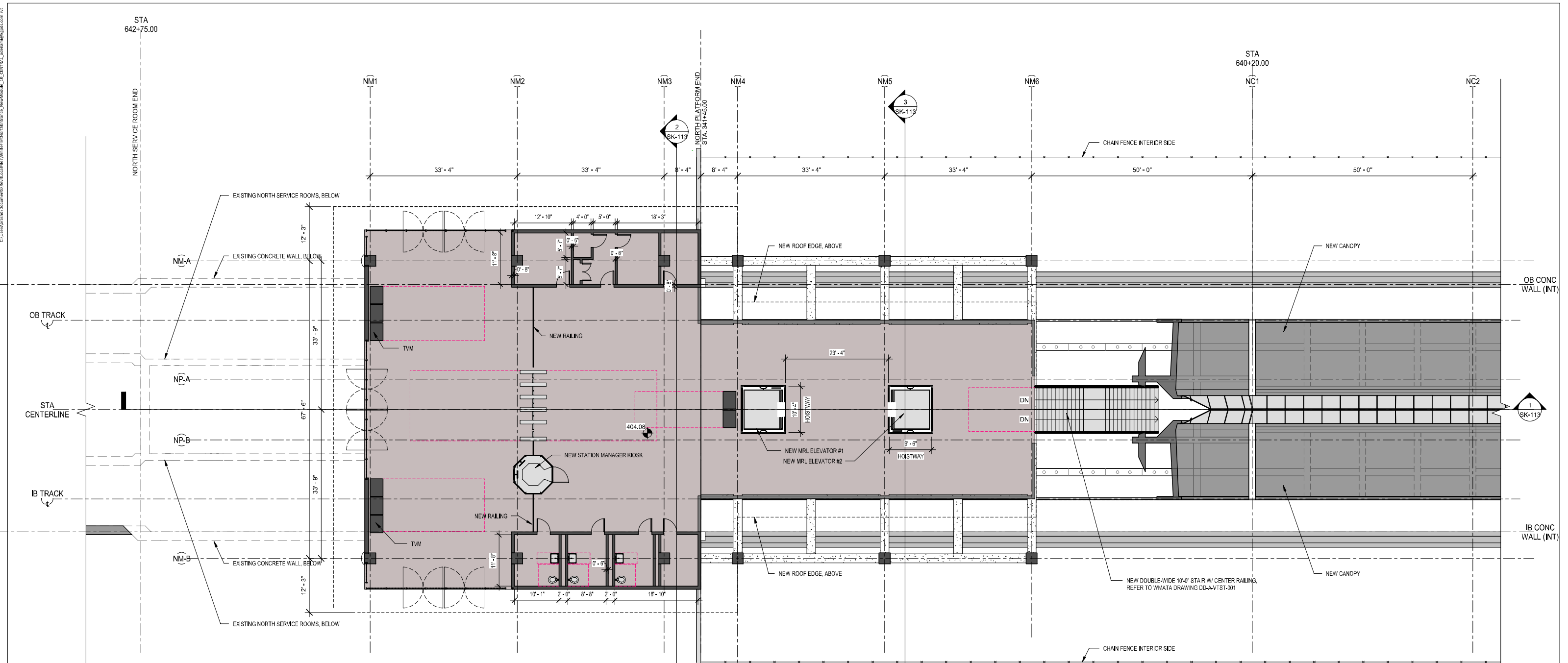


1  
SK-107  
NEW NORTH ENTRANCE - MEZZANINE LEVEL - STRUCT  
ALT-1  
SCALE: 3/32" = 1'-0"  
0 5 10 20'

**LEGEND:**

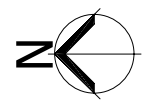
- EXISTING BUILDING
- NEW WALL
- NM# NEW NORTH MEZZANINE GRID
- NP# NEW NORTH PLATFORM GRID
- NC# NEW NORTH CANOPY GRID
- SC# SOUTH EXISTING CANOPY GRID



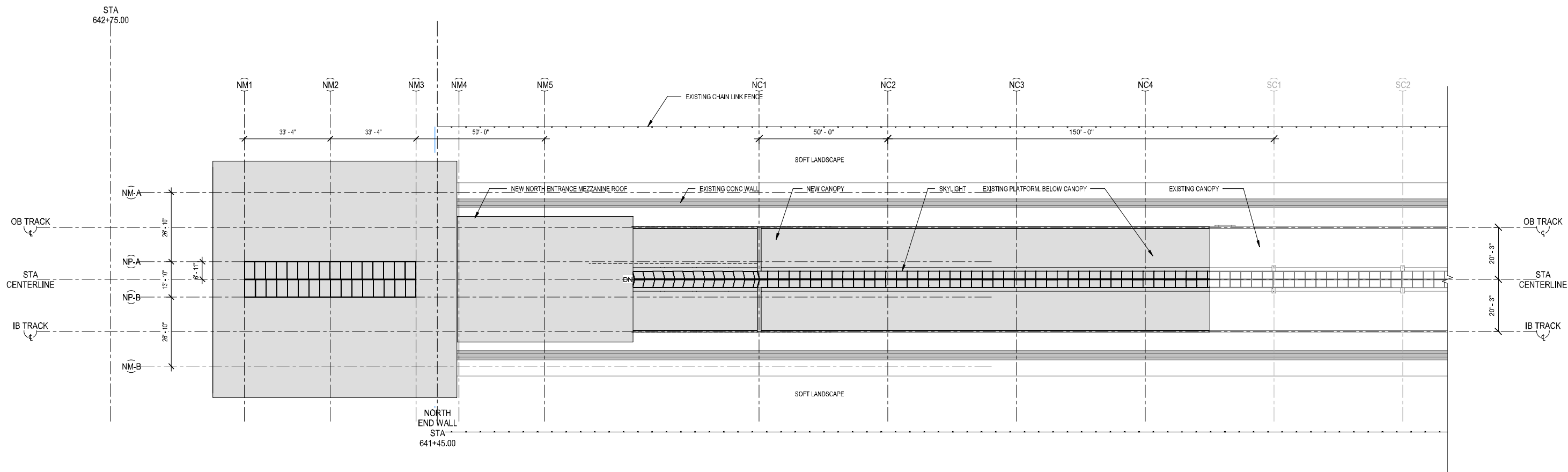


1 NEW NORTH ENTRANCE - MEZZANINE LEVEL - STRUCT ALT-2  
 SK-108 SCALE: 3/32" = 1'-0"  
 0 5 10 20

- LEGEND:**
- EXISTING BUILDING
  - NEW CONSTRUCTION
  - NM# NEW NORTH MEZZANINE GRID
  - NP# NEW NORTH PLATFORM GRID
  - NC# NEW NORTH CANOPY GRID
  - SC# SOUTH EXISTING CANOPY GRID



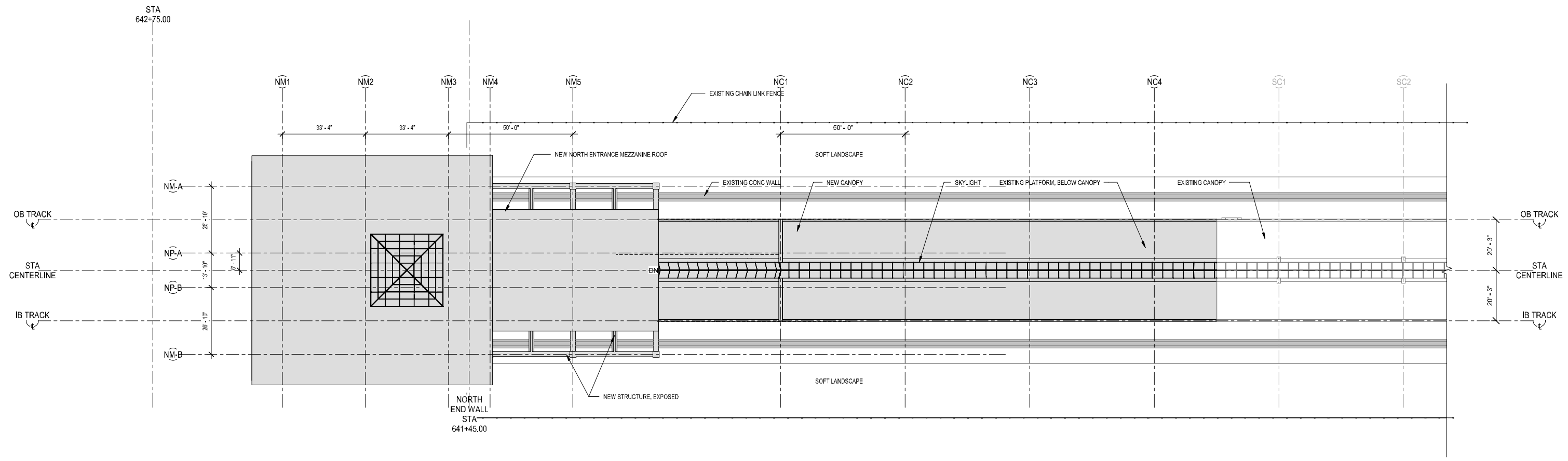
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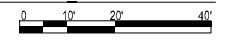
- LEGEND:**
- EXISTING BUILDING
  - NEW CONSTRUCTION
  - NEW NORTH MEZZANINE GRID
  - NEW NORTH PLATFORM GRID
  - NEW NORTH CANOPY GRID
  - SOUTH EXISTING CANOPY GRID



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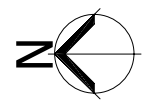


1  
SK-110 NEW NORTH ENTRANCE - ROOF LEVEL - STRUCT ALT-2  
SCALE 1" = 20'-0"

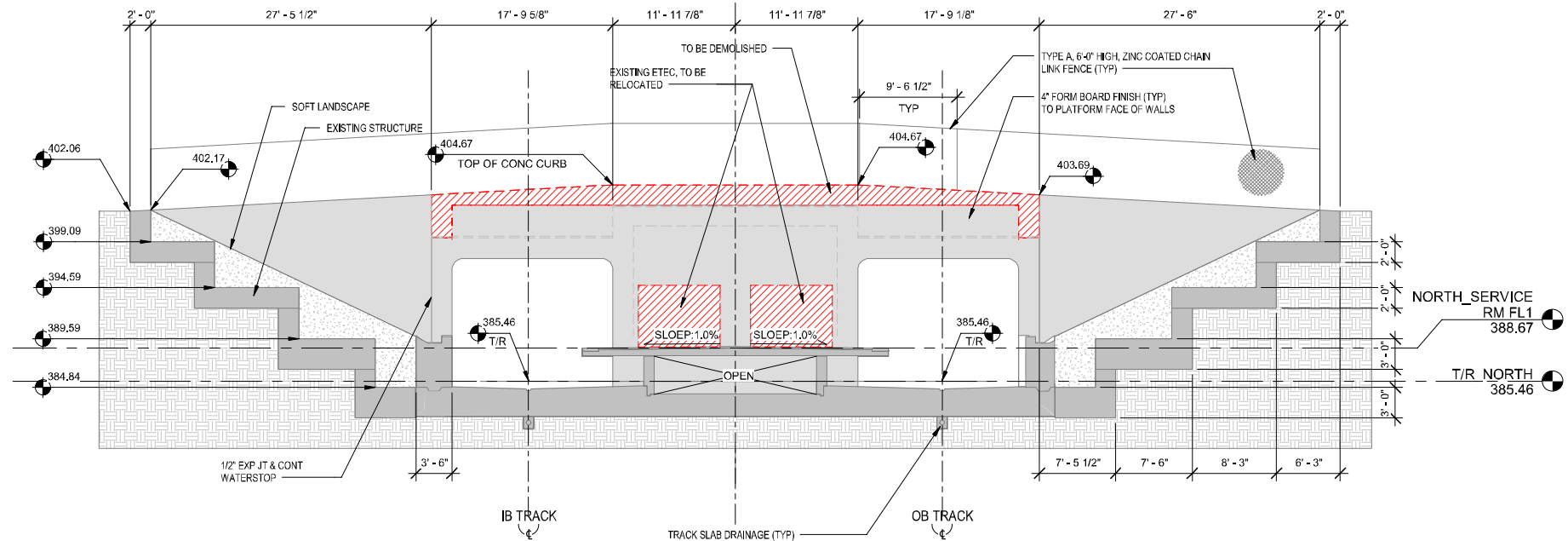


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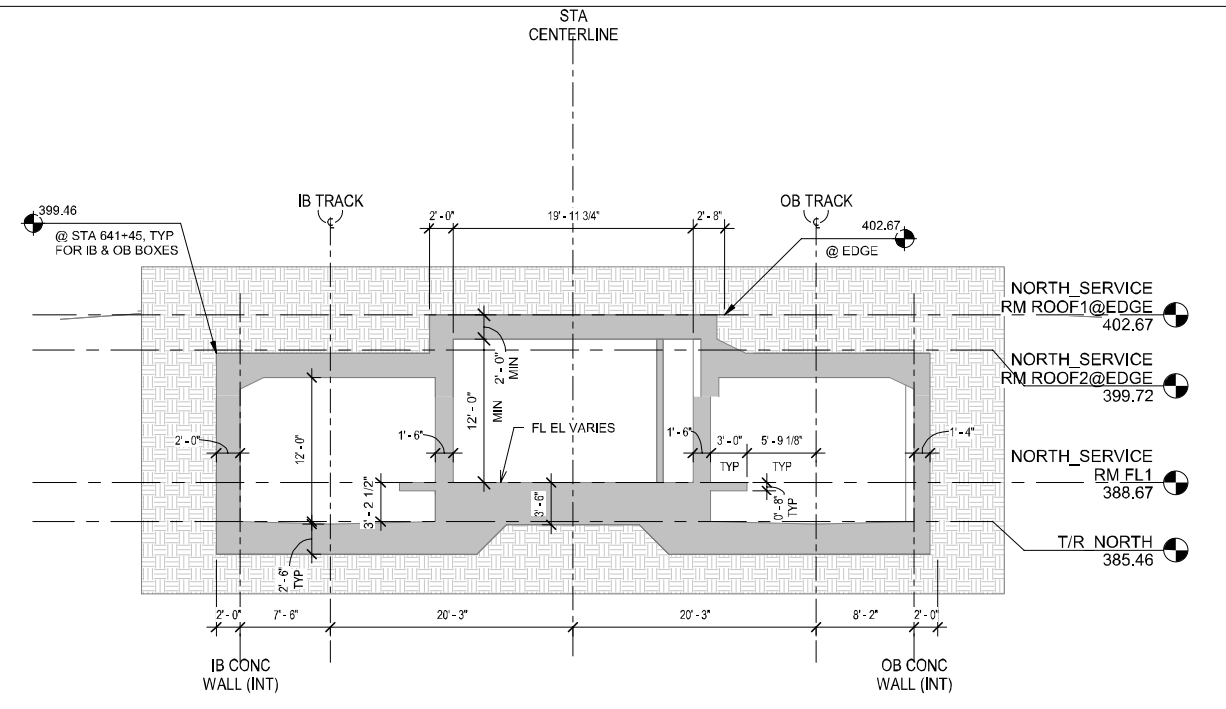
- EXISTING BUILDING
- NEW CONSTRUCTION
- NM# NEW NORTH MEZZANINE GRID
- NP# NEW NORTH PLATFORM GRID
- NC# NEW NORTH CANOPY GRID
- SC# SOUTH EXISTING CANOPY GRID



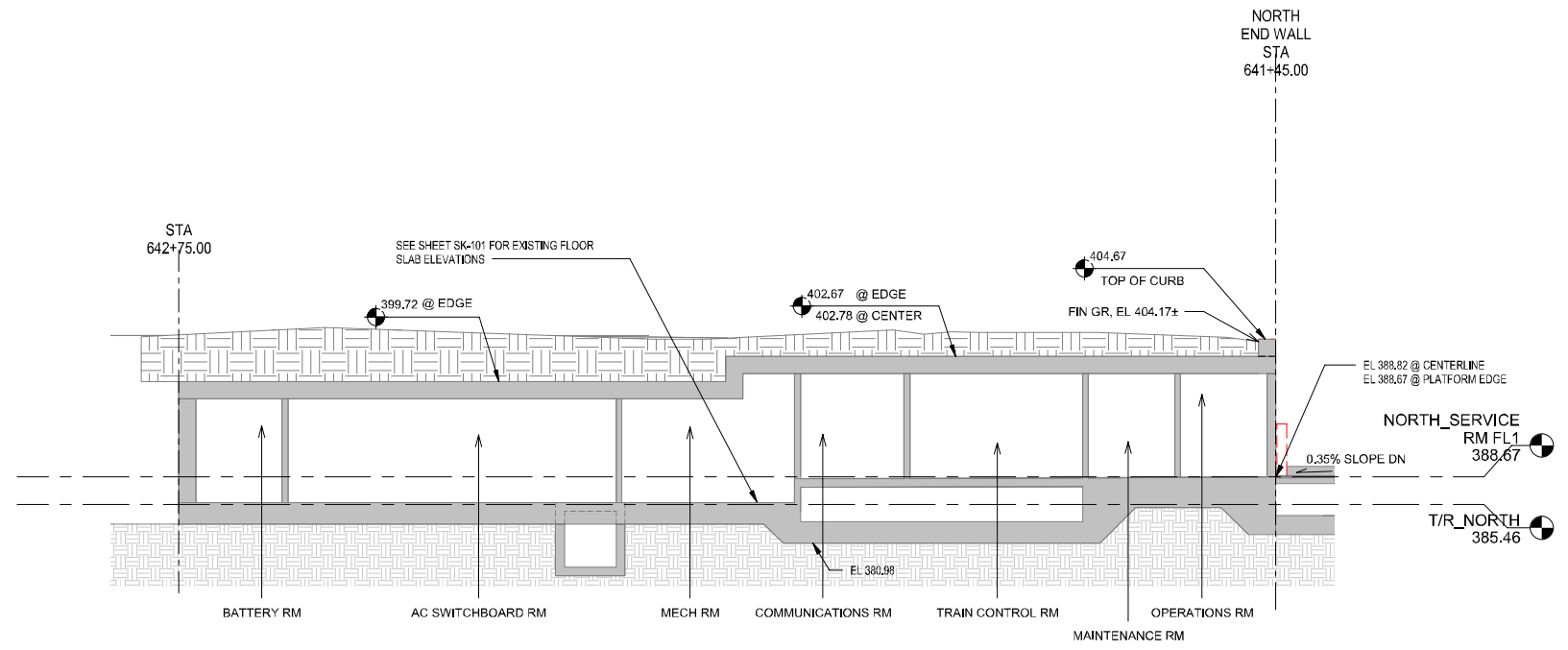




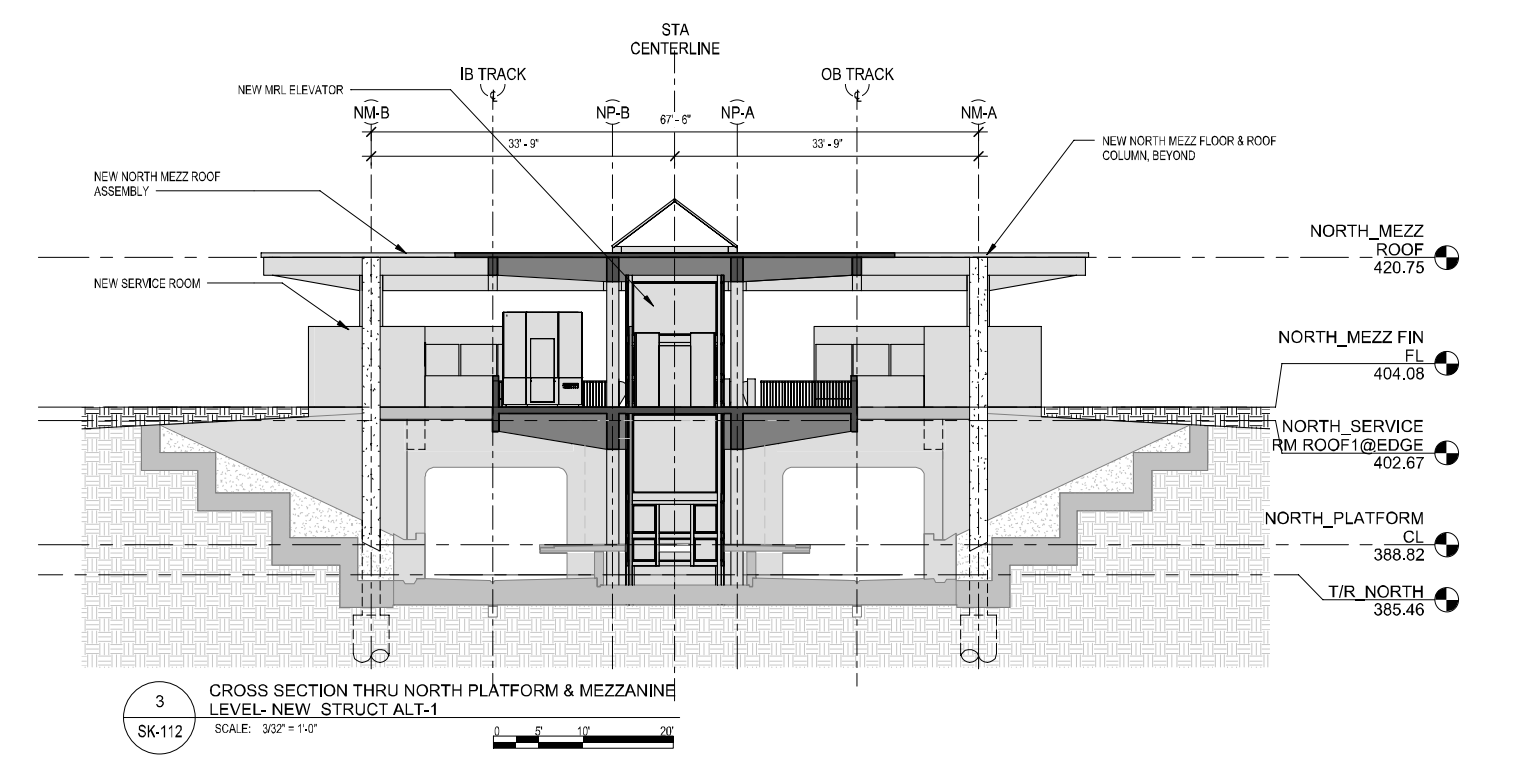
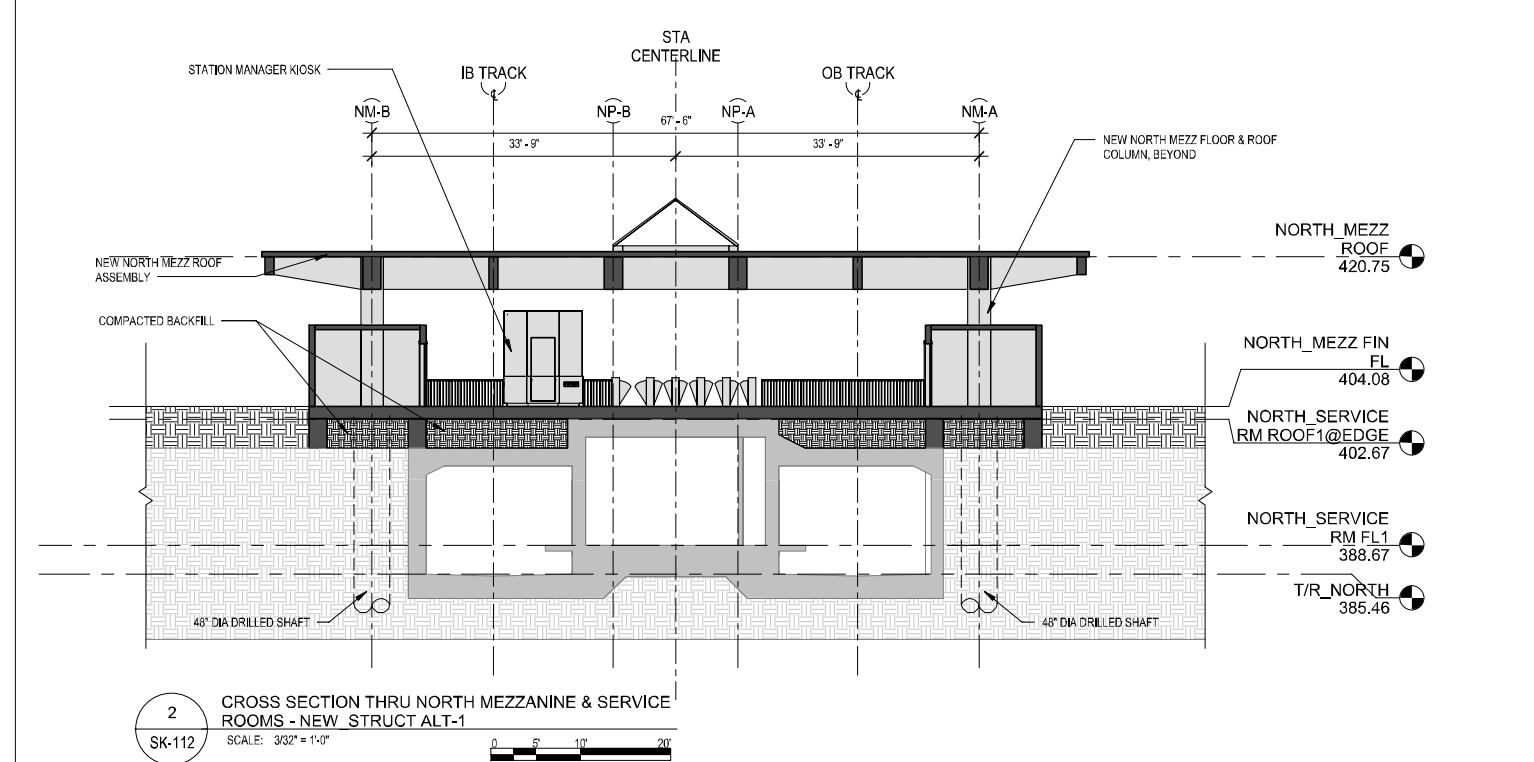
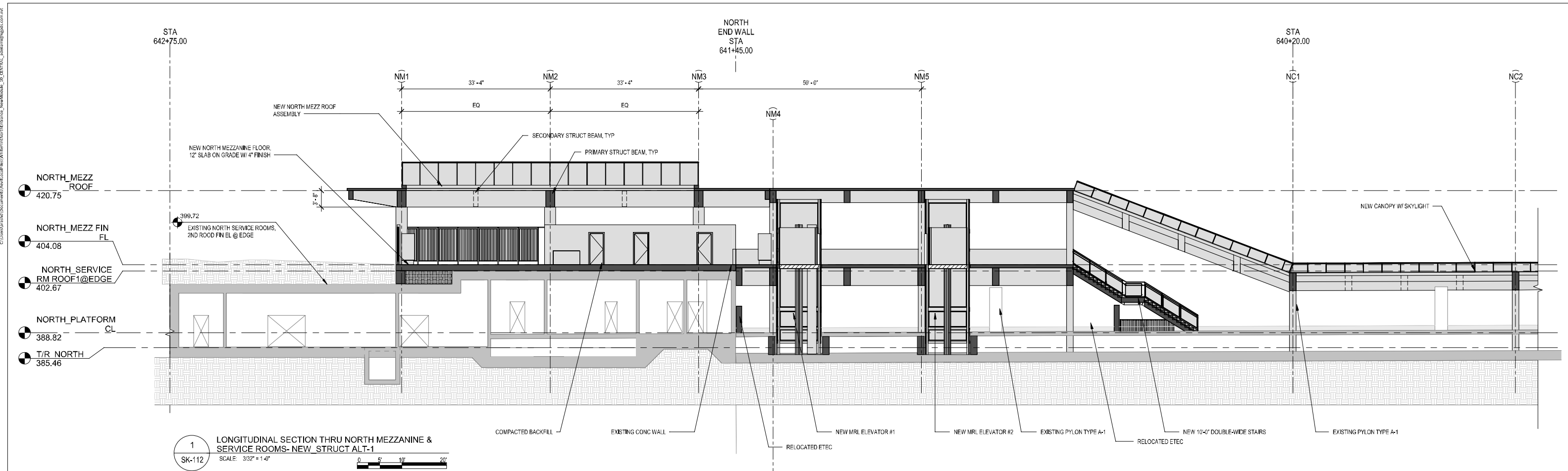
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 SK-111 SCALE: 1/8" = 1'-0"  
 0 4 8 16

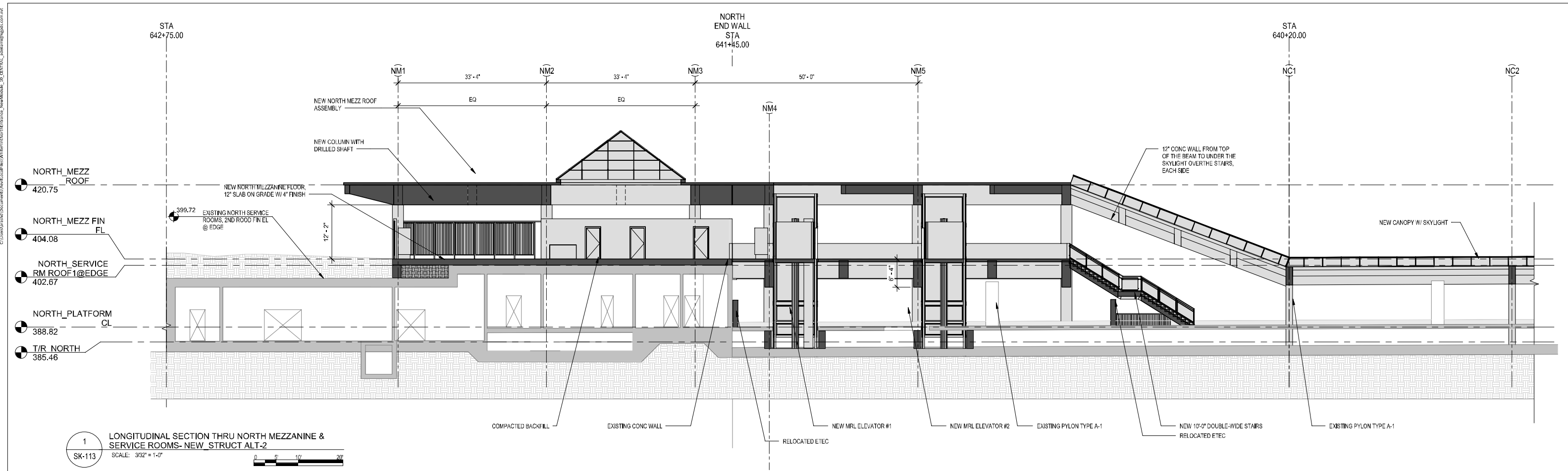


2 CROSS SECTION THRU NORTH OPERATIONS RM - EXISTING  
 SK-111 SCALE: 1/8" = 1'-0"  
 0 4 8 16

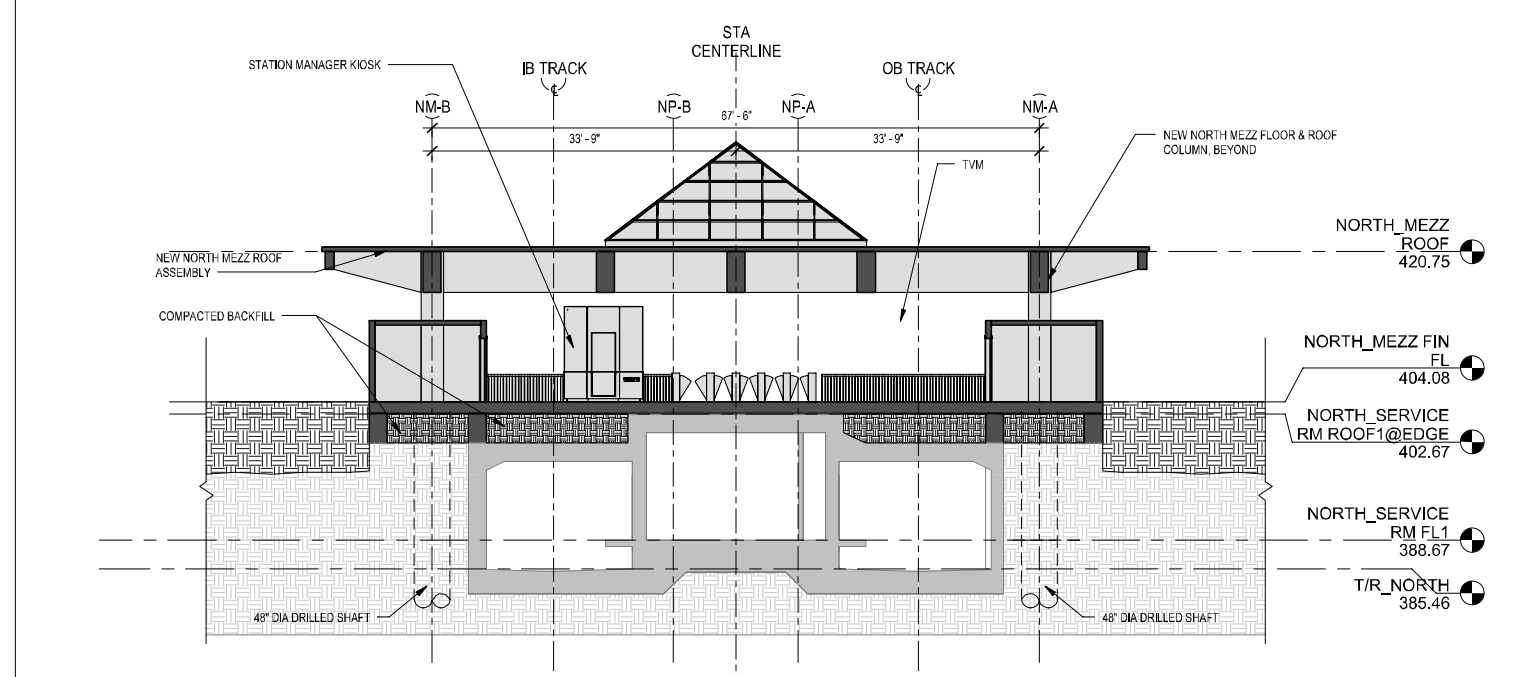


3 LONGITUDINAL SECTION THRU NORTH SERVICE ROOMS - EXISTING  
 SK-111 SCALE: 3/32" = 1'-0"  
 0 5 10 20

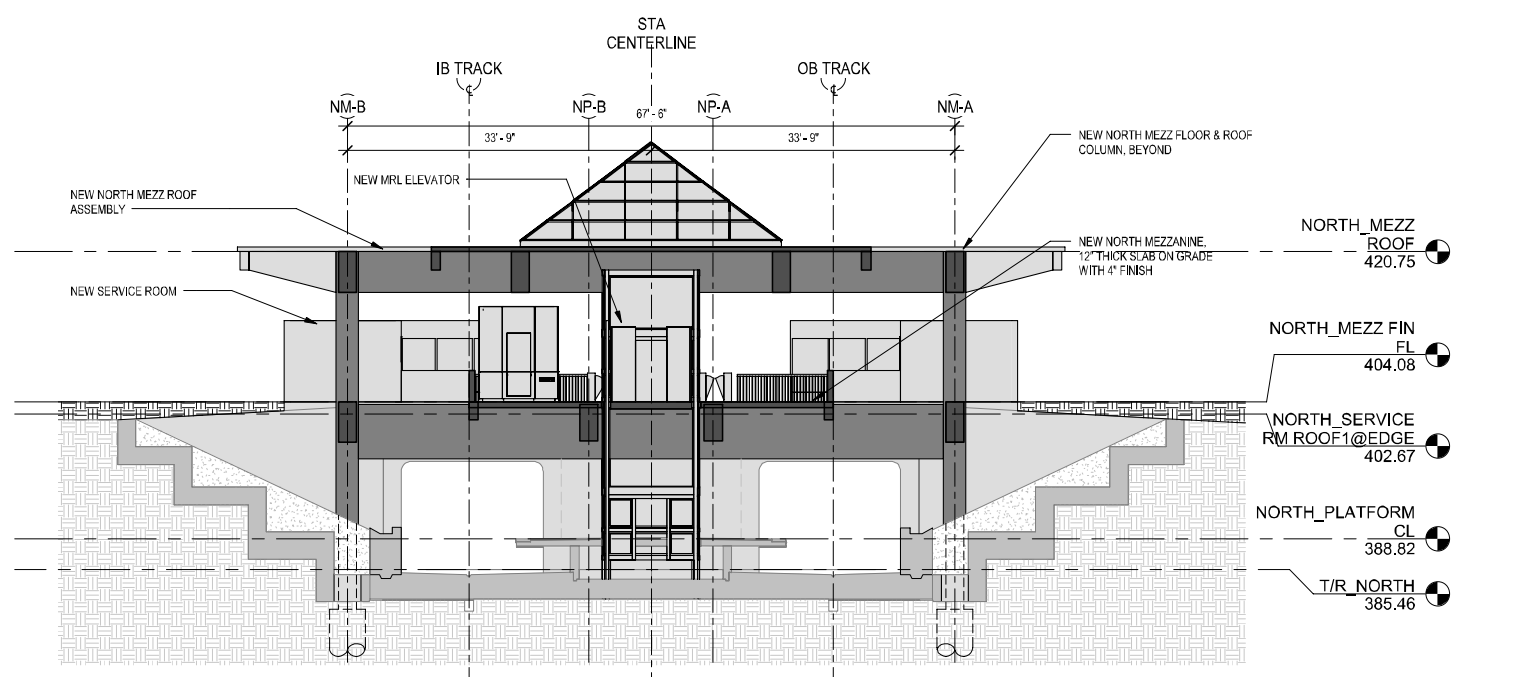




1 LONGITUDINAL SECTION THRU NORTH MEZZANINE & SERVICE ROOMS-NEW\_STRUCT ALT-2  
 SCALE: 3/32" = 1'-0"  
 SK-113

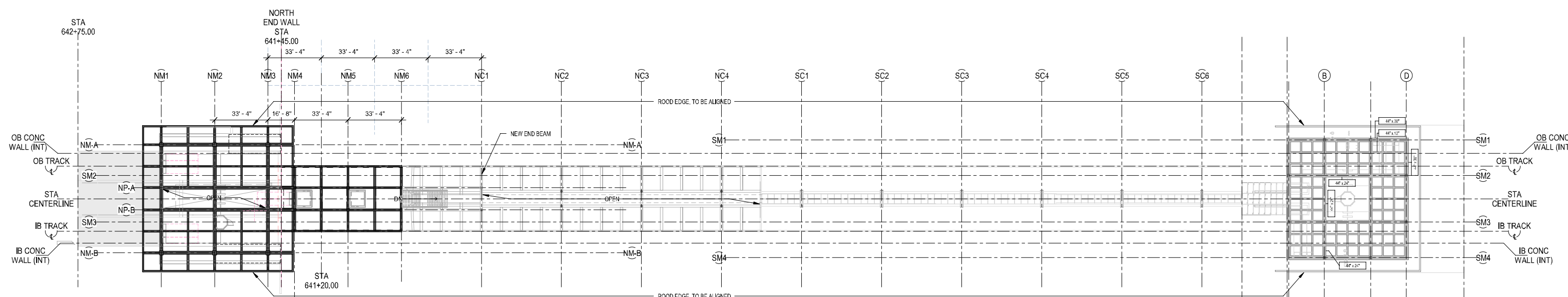


2 CROSS SECTION THRU NORTH MEZZANINE & SERVICE ROOMS - NEW\_STRUCT ALT-2  
 SCALE: 3/32" = 1'-0"  
 SK-113



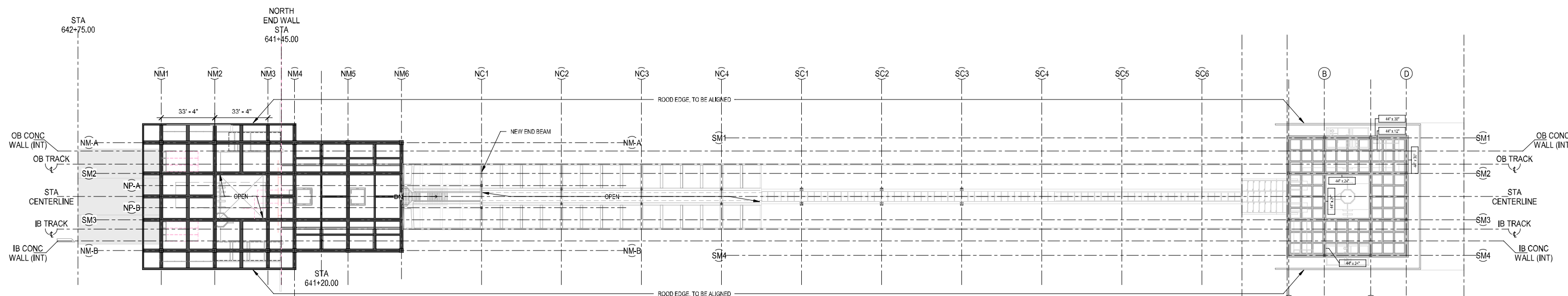
3 CROSS SECTION THRU NORTH PLATFORM & MEZZANINE LEVEL-NEW\_STRUCT ALT-2  
 SCALE: 3/32" = 1'-0"  
 SK-113

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1 NORTH MEZZ ROOF - ALTERNATIVE 1  
SK-S01 SCALE: 1" = 30'-0"

SOUTH PLATFORM BEGIN STA 635+45.00  
SOUTH MEZZANINE END STA 635+16.75  
SOUTH SERVICE ROOM END STA 634+06.42

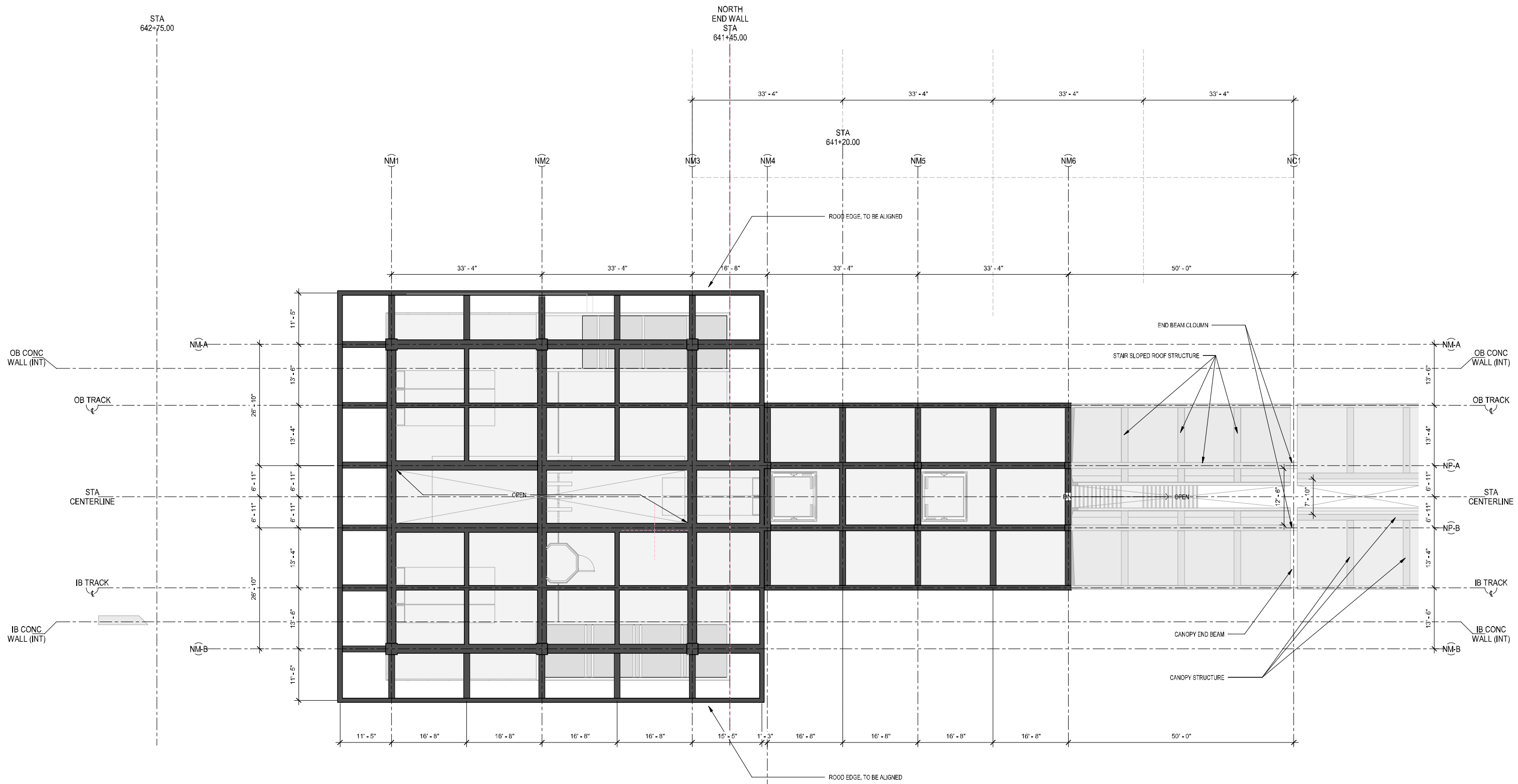


2a NORTH MEZZ ROOF - ALTERNATIVE 2  
SK-S01 SCALE: 1" = 30'-0"

SOUTH PLATFORM BEGIN STA 635+45.00  
SOUTH MEZZANINE END STA 635+16.75  
SOUTH SERVICE ROOM END STA 634+06.42

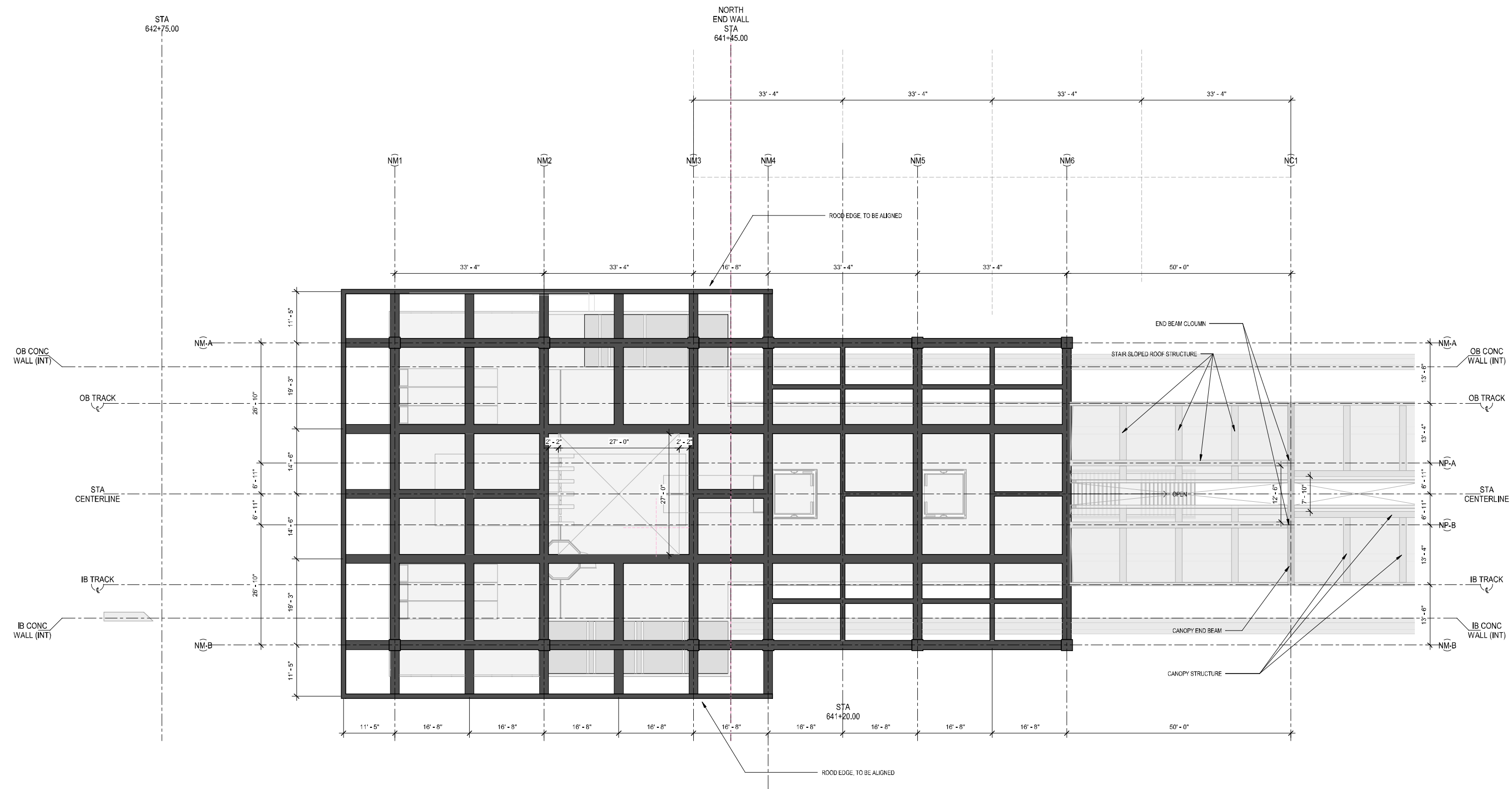


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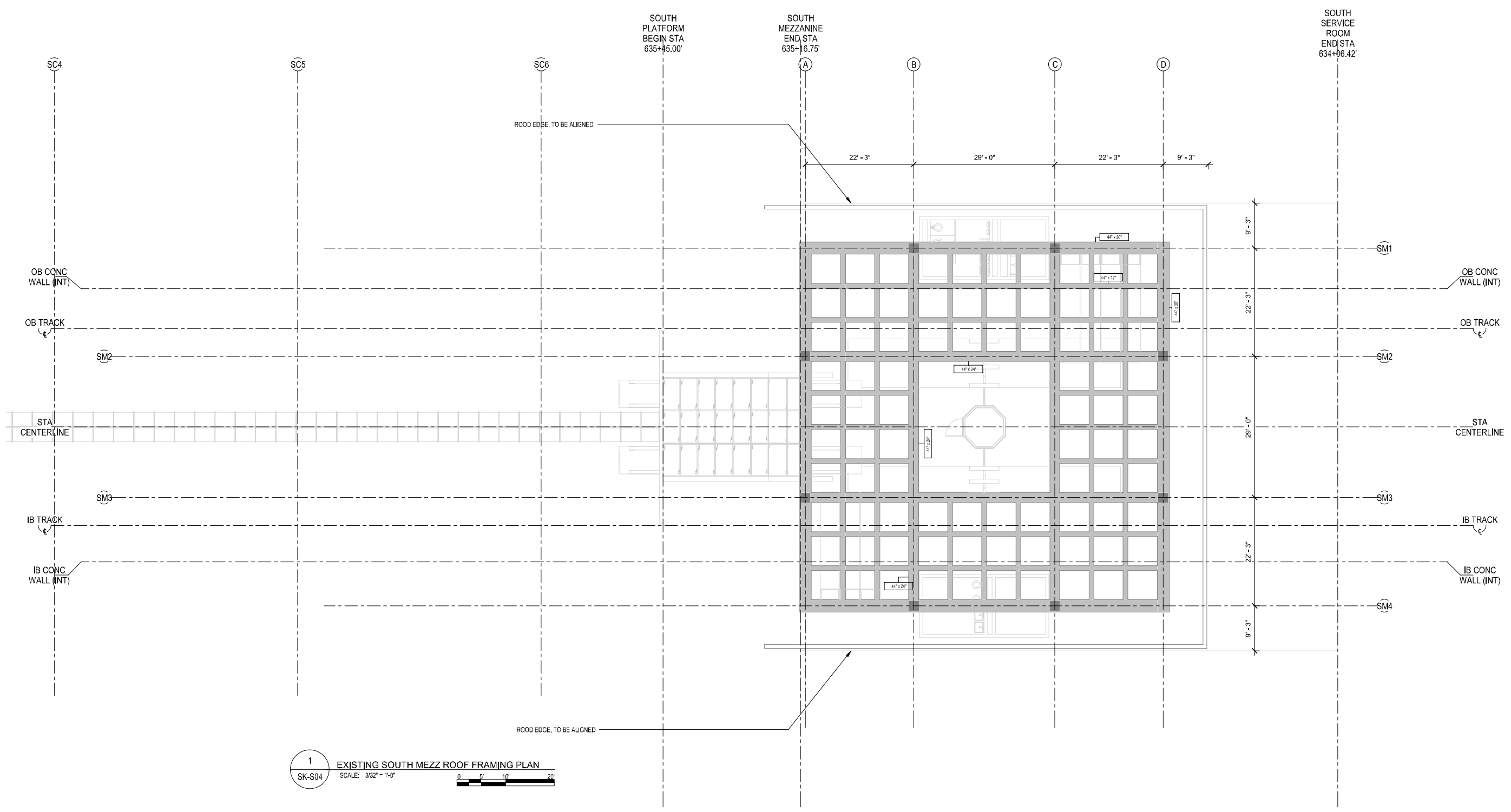
1 NORTH MEZZ ROOF FRAMING PLAN - ALT 1  
SK-S02 SCALE: 3/32" = 1'-0"

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1  
 SK-S03 NORTH MEZZ ROOF FRAMING PLAN - ALT 2  
 SCALE: 3/32" = 1'-0"

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1  
 SK-S04 EXISTING SOUTH MEZZ ROOF FRAMING PLAN  
 SCALE: 3/32" = 1'-0"  
 0 5 10 20

# WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY



## A/E PLANNING SERVICES FOR WHITE FLINT NORTH ENTRANCE FEASIBILITY STUDY

04/29/2019

**KGP** design studio

**AECOM**

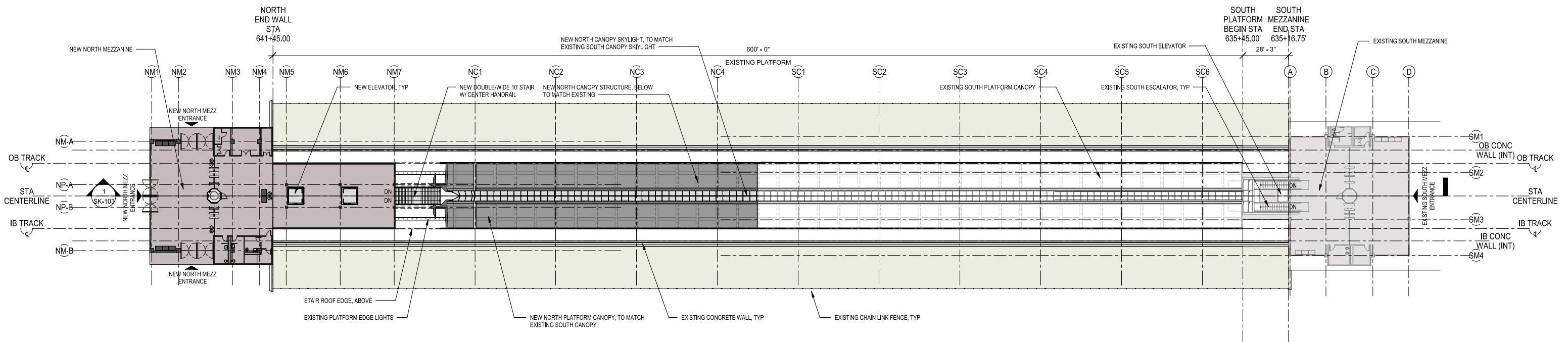


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SHEET INDEX		
SHEET NUMBER	SHEET NAME	SHEET ISSUE DATE
SK-000	COVER SHEET	04/29/19
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SK-103	OVERALL LONGITUDINAL SECTIONS	04/29/19
SK-104	EXISTING NORTH SERVICE ROOMS - PLATFORM LEVEL	04/29/19
SK-105	NEW NORTH ENTRANCE - PLATFORM LEVEL - OPTION- 3	04/29/19
SK-107	NEW NORTH ENTRANCE - MEZZANINE LEVEL - OPTION- 3	04/29/19
SK-109	NEW NORTH ENTRANCE - ROOF LEVEL - OPTION- 3	04/29/19
SK-111	SECTIONS - EXISTING CONDITION	04/29/19
SK-112	SECTIONS- NEW DESIGN - OPTION- 3	04/29/19
SK-S01	OVERALL MEZZANINES ROOF FRAMING PLAN	04/29/19
SK-S02	NORTH MEZZANINE ROOF FRAMING PLAN	04/29/19










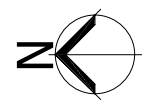
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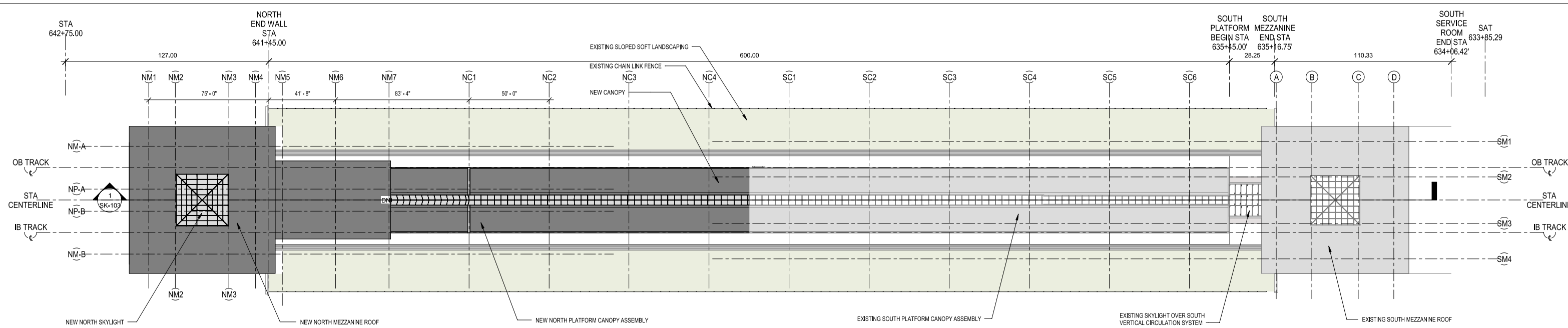
1  
SK-101 OVERALL MEZZANINE PLAN STRUCT ALT-1  
SCALE: 1" = 30'-0"

**LEGEND:**

- |   |                        |   |                            |
|---|------------------------|---|----------------------------|
|  | EXISTING BUILDING      |  | NEW NORTH MEZZANINE GRID   |
|  | NEW CONSTRUCTION       |  | NEW NORTH PLATFORM GRID    |
|  | EXISTING SOFTLANDSCAPE |  | NEW NORTH CANOPY GRID      |
|   |                        |  | SOUTH EXISTING CANOPY GRID |



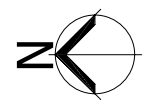
C:\Users\jand\Documents\WhiteFlint\Entrance\_Study\A24\_SK-102\_OverallRoofPlan.dwg



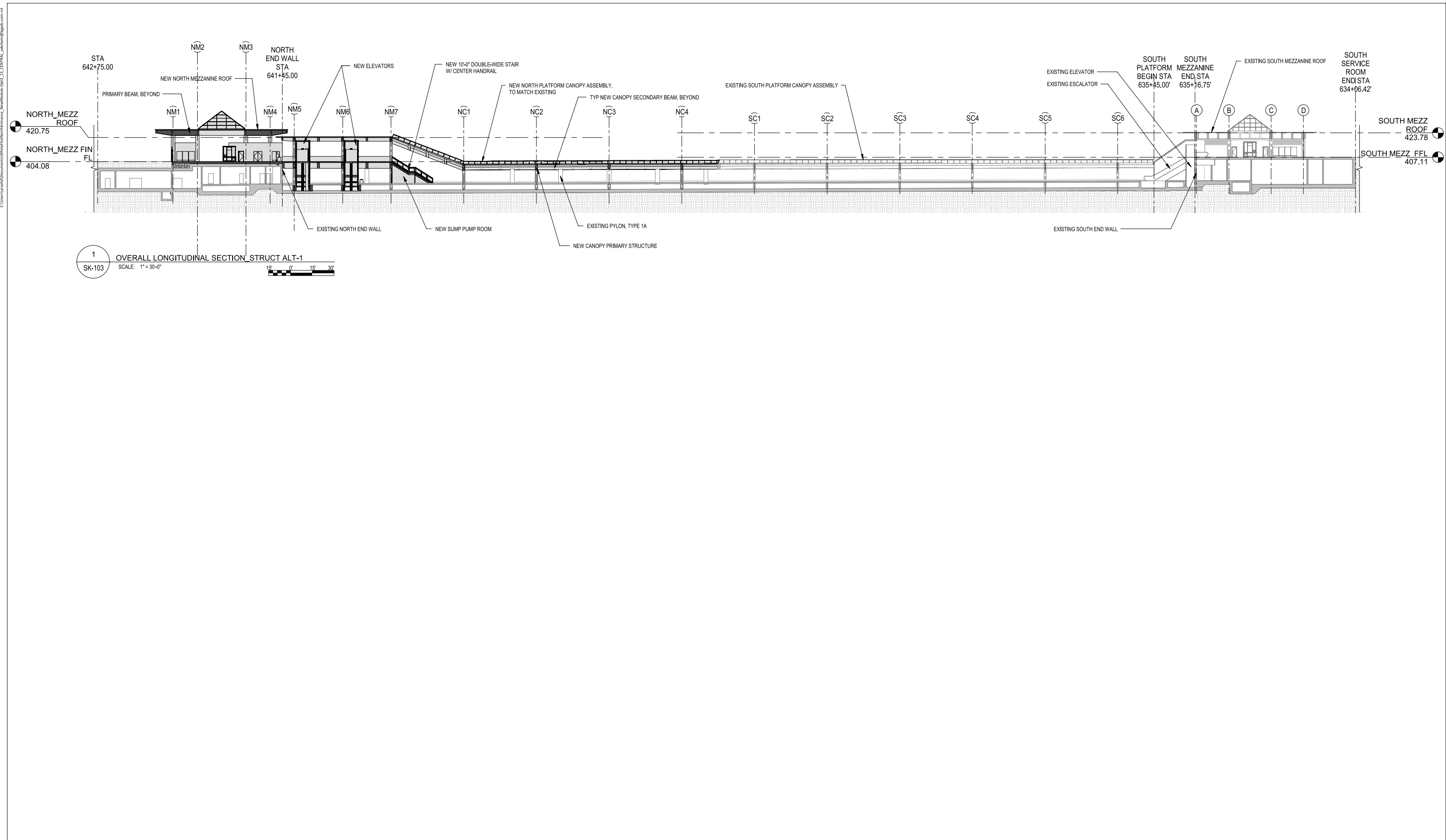
1 OVERALL ROOF PLAN STRUCT ALT-1  
SK-102 SCALE: 1" = 30'-0"

**LEGEND:**

- EXISTING BUILDING
- NEW CONSTRUCTION
- EXISTING SOFTLANDSCAPE
- NEW NORTH MEZZANINE GRID
- NEW NORTH PLATFORM GRID
- NEW NORTH CANOPY GRID
- SOUTH EXISTING CANOPY GRID

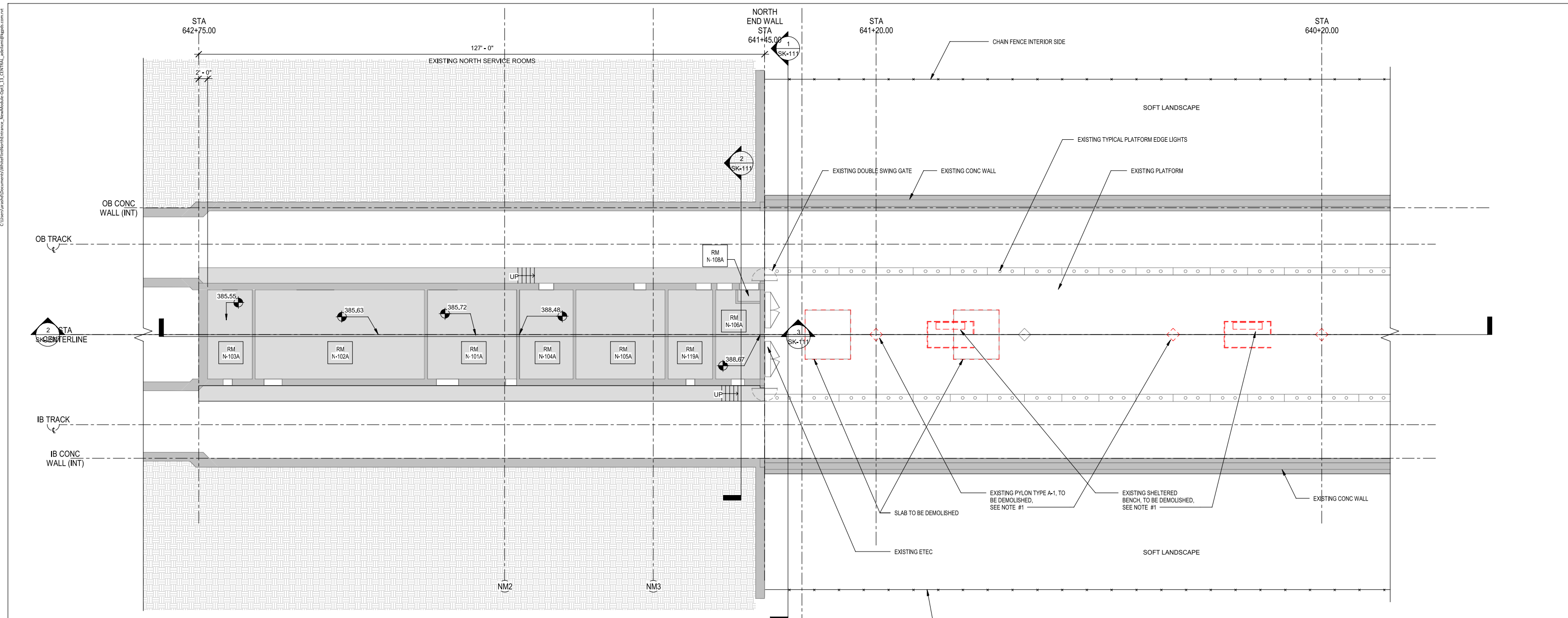


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1  
SK-103 OVERALL LONGITUDINAL SECTION STRUCT ALT-1  
SCALE: 1" = 30'-0"  
15' 0' 15' 30'













1  
SK-104  
EXISTING NORTH SERVICE ROOMS - PLATFORM LEVEL  
SCALE: 3/32" = 1'-0"  
0 5 10 20'

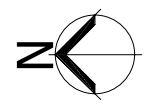
EXISTING ROOM SCHEDULE- NORTH	
ROOM NUMBER	ROOM NAME
N-101A	EXISTING MECHANICAL ROOM
N-102A	EXISTING NORTH AC SWITCHBOARD ROOM
N-103A	EXISTING NORTH BATTERY ROOM
N-104A	EXISTING NORTH COMMUNICATIONS ROOM
N-105A	EXISTING TRAIN CONTROL ROOM
N-106A	EXISTING NORTH OPERATIONS ROOM
N-108A	EXISTING NORTH FEC
N-119A	EXISTING NORTH MAINTENANCE ROOM

**LEGEND:**

-  EXISTING BUILDING
-  NEW CONSTRUCTION
-  NEW NORTH MEZZANINE GRID
-  NEW NORTH PLATFORM GRID
-  NEW NORTH CANOPY GRID
-  SOUTH EXISTING CANOPY GRID
-  EXISTING TO BE DEMOLISHED
-  EXISTING TO BE DEMOLISHED OR RELOCATED

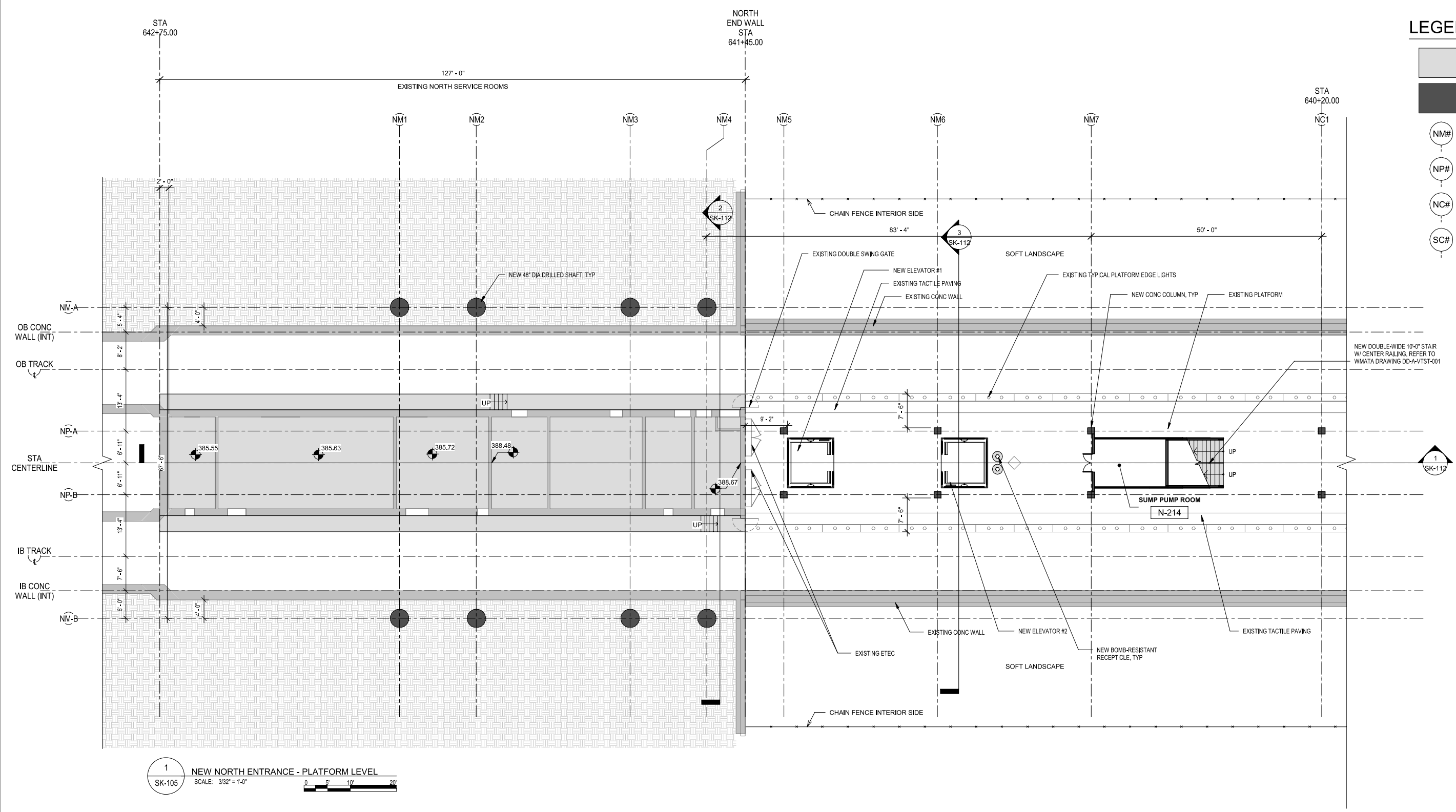
**SHEET NOTES:**

1. LOCATION OF PLATFORM FURNITURE AND EQUIPMENT TO BE VERIFIED IN FIELD.
2. SEE SHEET A14-S-21 & S-23 FROM WMATA AS-BUILT DRAWINGS FOR MORE INFORMATION.

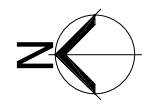


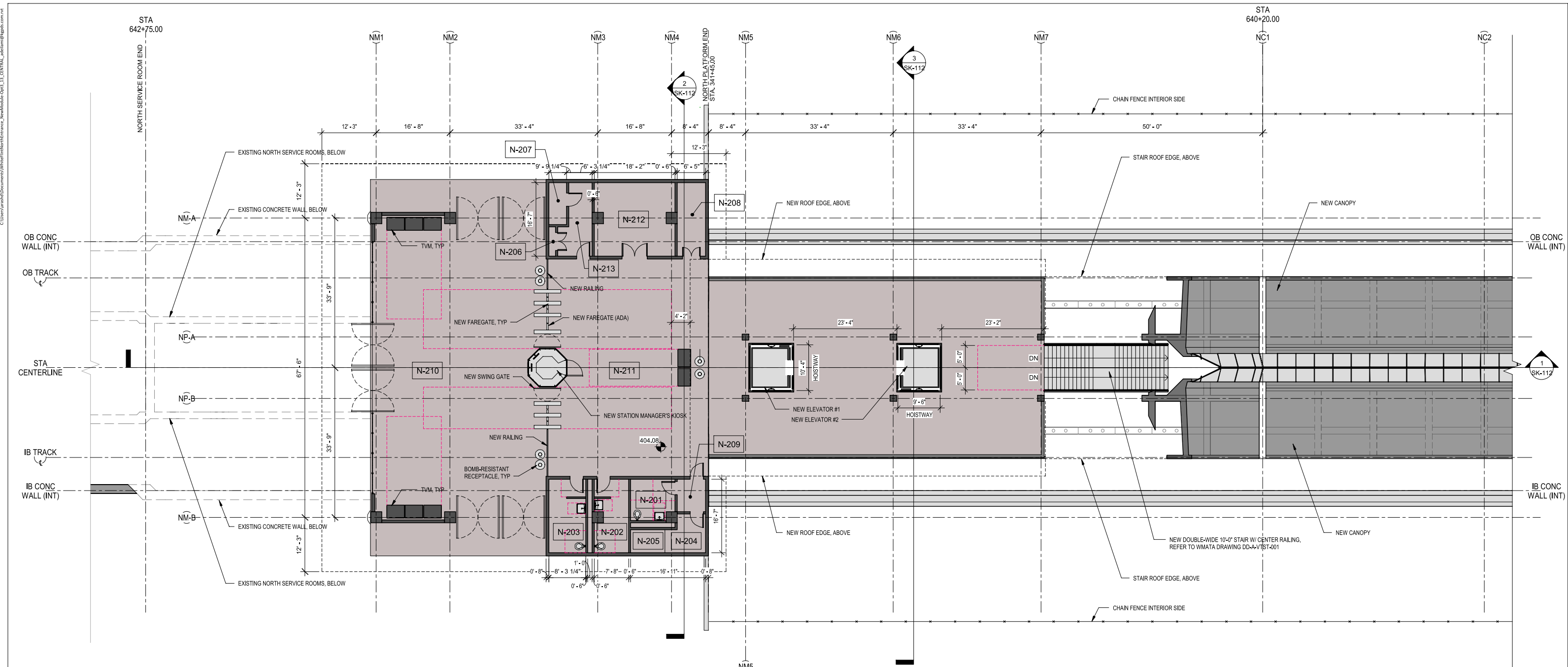
**LEGEND:**

- EXISTING BUILDING
- NEW CONSTRUCTION
- NM# NEW NORTH MEZZANINE GRID
- NP# NEW NORTH PLATFORM GRID
- NC# NEW NORTH CANOPY GRID
- SC# SOUTH EXISTING CANOPY GRID



**1**  
 SK-105  
 NEW NORTH ENTRANCE - PLATFORM LEVEL  
 SCALE: 3/32" = 1'-0"





1  
SK-107  
NEW NORTH ENTRANCE - MEZZANINE LEVEL - STRUCT  
ALT-1  
SCALE: 3/32" = 1'-0"  
0 5 10 20'

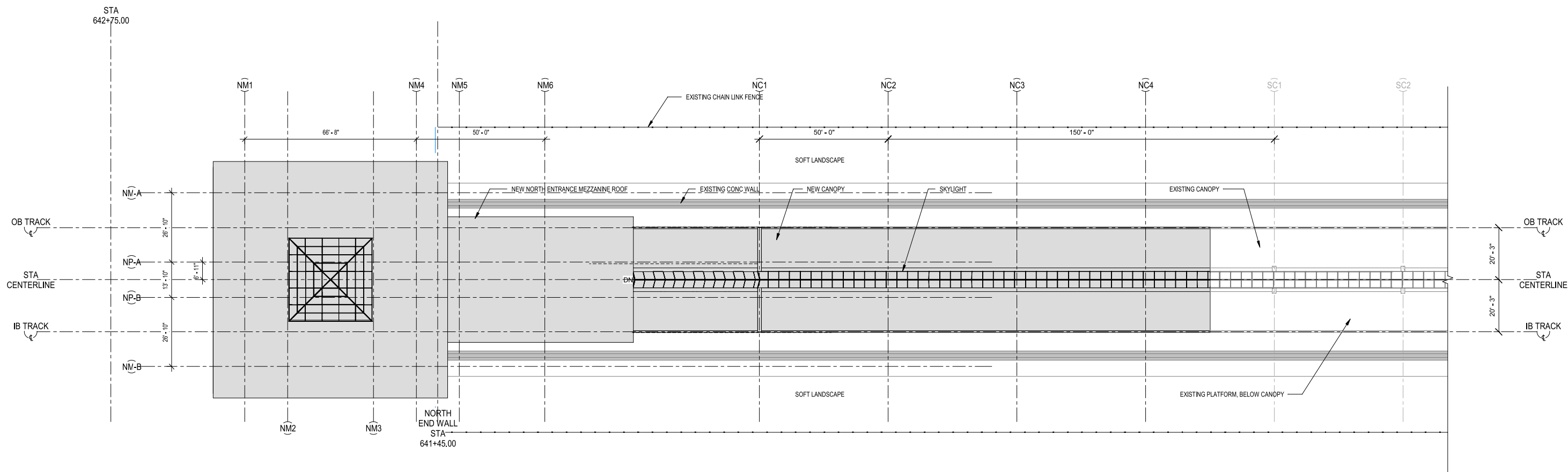
NEW Room Schedule- NORTH		
ROOM NUMBER	ROOM NAME	Area
N-201	UNISEX STAFF RESTROOM	89 SF
N-202	PUBLIC RESTROOM (M)	121 SF
N-203	PUBLIC RESTROOM (W)	136 SF
N-204	CLEANER'S ROOM	71 SF
N-205	WATER SERVICE ROOM	41 SF
N-206	FEC	10 SF
N-207	BELL SYS ROOM	38 SF
N-208	ELECTRICAL CABINET ROOM	106 SF
N-209	CORRIDOR	47 SF
N-210	NORTH MEZZANINE (UNPAID SIDE)	2659 SF
N-211	NORTH MEZZANINE (PAID SIDE)	Not Enclosed
N-212	ELEVATOR CONTROL ROOM	291 SF
N-213	CORRIDOR	104 SF

**LEGEND:**

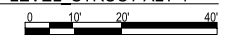
- EXISTING BUILDING
- NEW CONSTRUCTION
- NEW NORTH MEZZANINE GRID
- NEW NORTH PLATFORM GRID
- NEW NORTH CANOPY GRID
- SOUTH EXISTING CANOPY GRID









C:\Users\jacob\Documents\WhiteFlint\Entrance\_Web\sk-109\_13\_CENTRAL\_elevation.dwg, 13\_CENTRAL\_elevation.dwg, 13\_CENTRAL\_elevation.dwg

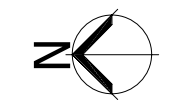


1  
SK-109 NEW NORTH ENTRANCE - ROOF LEVEL STRUCT ALT-1  
SCALE: 1" = 20'-0"

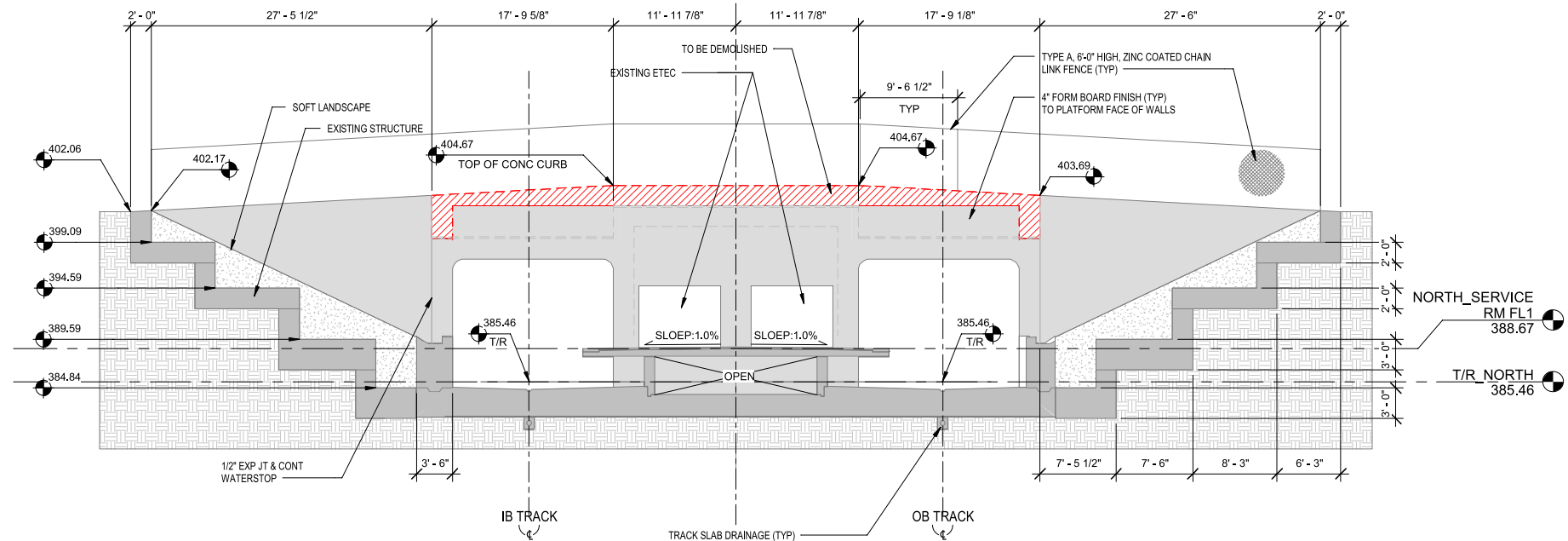


**LEGEND:**

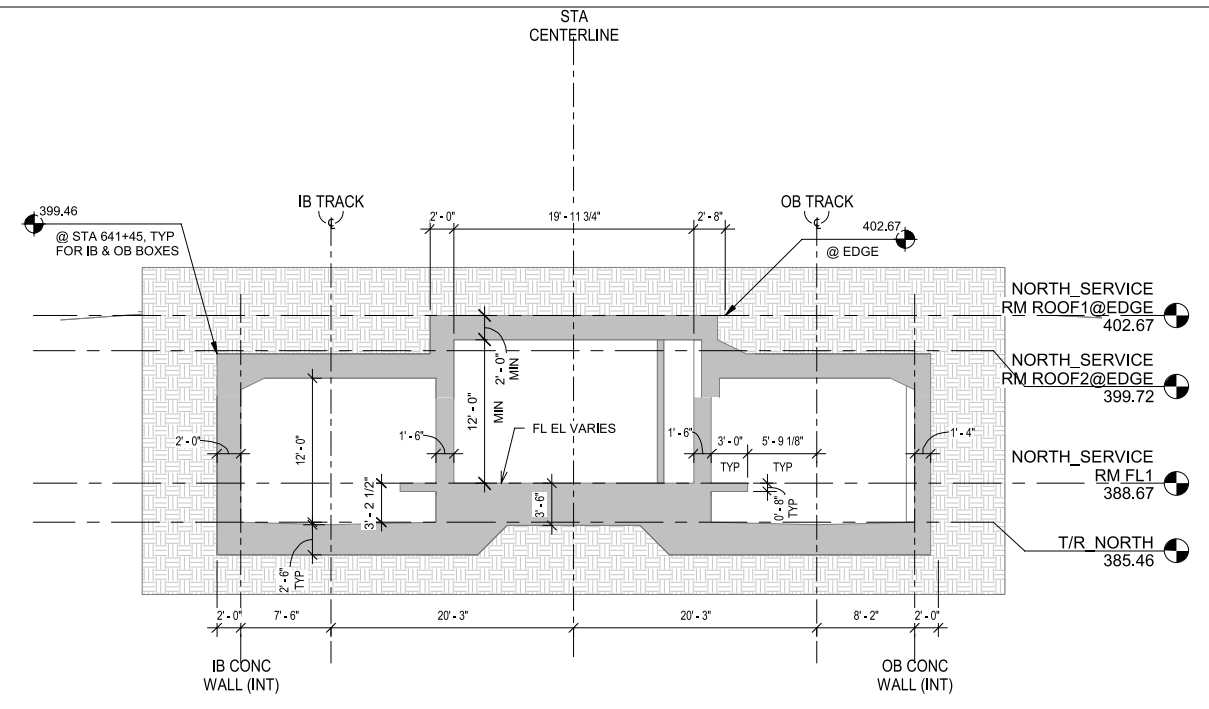
-  EXISTING BUILDING
-  NEW CONSTRUCTION
-  NEW NORTH MEZZANINE GRID
-  NEW NORTH PLATFORM GRID
-  NEW NORTH CANOPY GRID
-  SOUTH EXISTING CANOPY GRID



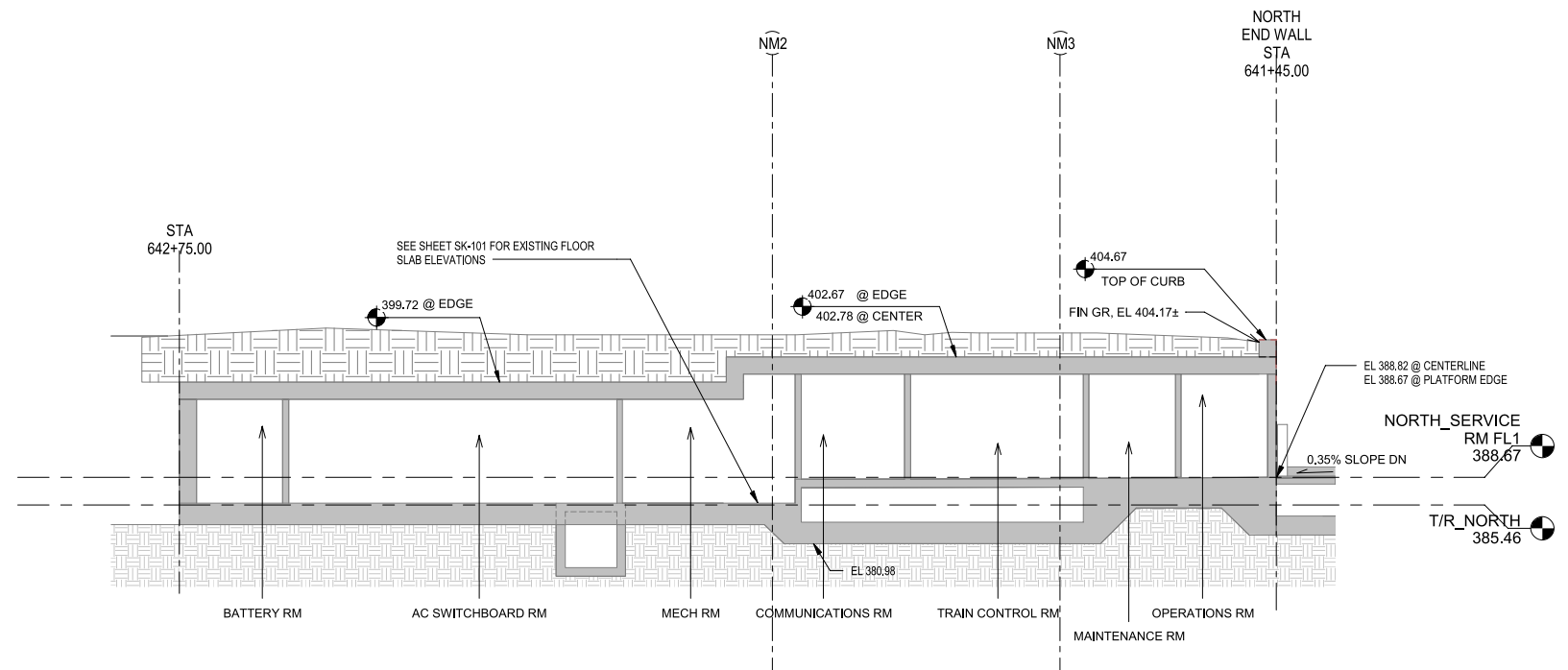




1 CROSS SECTION @ PLATFORM NORTH END WALL - EXISTING  
 SK-111 SCALE: 1/8" = 1'-0"



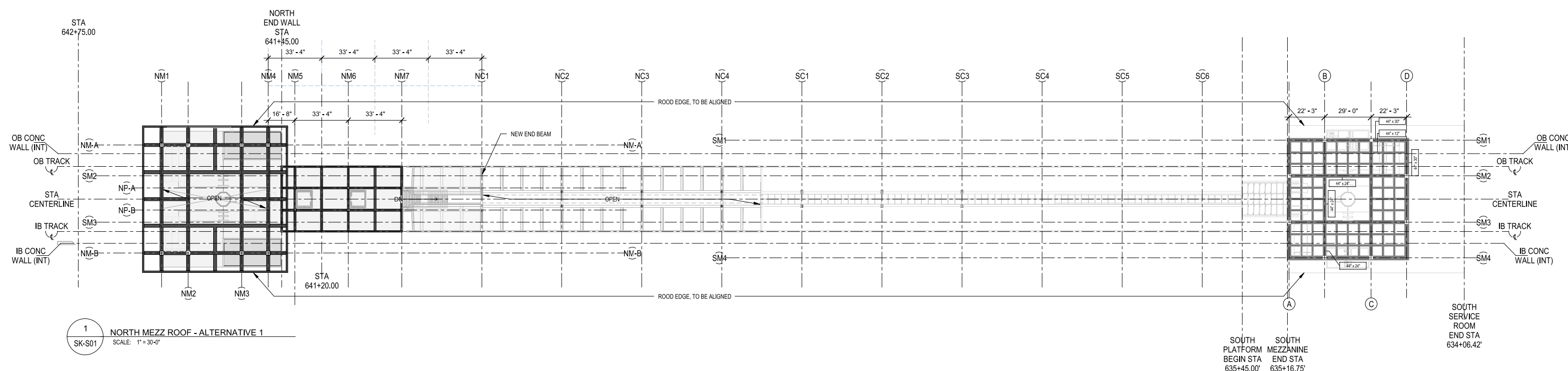
2 CROSS SECTION THRU NORTH OPERATIONS RM - EXISTING  
 SK-111 SCALE: 1/8" = 1'-0"



3 LONGITUDINAL SECTION THRU NORTH SERVICE ROOMS - EXISTING  
 SK-111 SCALE: 3/32" = 1'-0"



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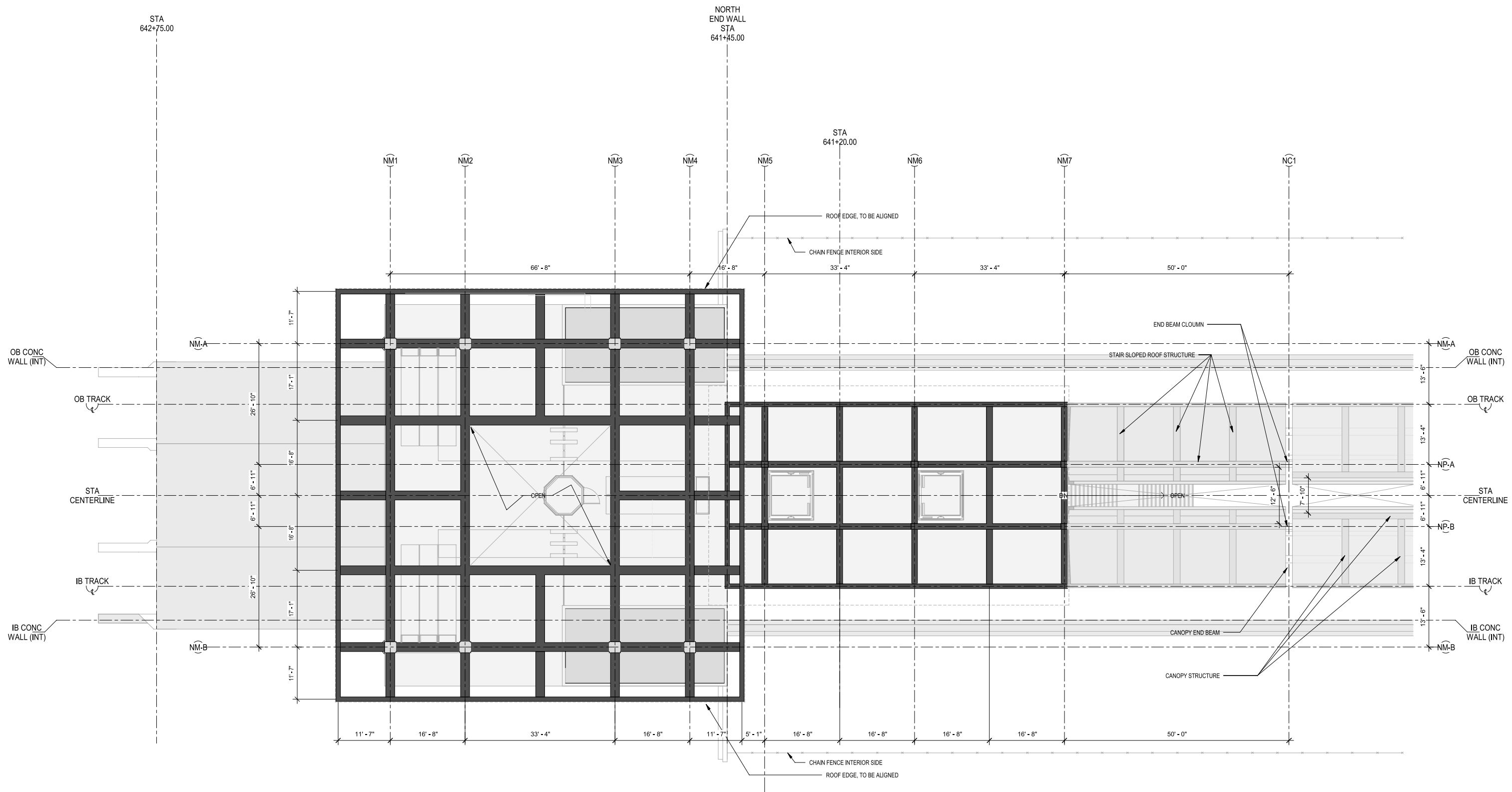


1 NORTH MEZZ ROOF - ALTERNATIVE 1  
 SK-S01 SCALE: 1" = 30'-0"

SOUTH PLATFORM BEGIN STA 635+45.00  
 SOUTH MEZZANINE END STA 635+16.75  
 SOUTH SERVICE ROOM END STA 634+06.42



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1 NORTH MEZZ ROOF FRAMING PLAN - ALT 1  
 SK-S02 SCALE: 3/32" = 1'-0"





## Appendix B:

### Rough Order- of-Magnitude (ROM) Cost Estimates

- Alternatives 1, 2, 3 ..... B-2

**PROJECT:** WMATA White Flint North Entrance Feasibility Study  
**Alternates 1, 2, & 3**  
**CONTRACT NO -** 60589655

Estimate by: SS 11/11/2019  
 Checked by: KS 11/11/2019

**Date Prepared:** 11/11/2019 **Project Phase:** Schematic

		30%	30%	4%	Estimated Mid-Point of Construction	ROW Cost Allowance	Total Project Cost		Duration	To Mid-Point
	Construction Total	Professional Services Cost	Unallocated Contingency	Mid-Point Escalation				Allocated Contingency		
<b>Alternate 1</b>	\$ 17,490,187	\$ 5,247,056	\$ 6,821,173	\$ 4,238,603	Aug-22	\$ -	\$ 33,800,000	30%	28.00 months	3.42 yrs
<b>Alternate 2</b>	\$ 16,934,935	\$ 5,080,481	\$ 6,604,625	\$ 4,104,043	Aug-22	\$ -	\$ 32,725,000	30%	28.00 months	3.42 yrs
<b>Alternate 3</b>	\$ 17,976,562	\$ 5,392,969	\$ 7,010,859	\$ 4,356,472	Aug-22	\$ -	\$ 34,800,000	30%	28.00 months	3.42 yrs

**Assumptions**

- Estimates are prepared using current dollars (2019)
- Adequate experienced craft labor is available
- Normal productivity rates as historically experienced are utilized
- Compatible trade agreements exist in the region
- No strike impacts will be experienced by the project
- There are sufficient experienced contractors available to perform said work
- Normal Metro Washington D.C. area weather impacts to constructions schedule
- Existing state of the art construction technology will be utilized
- Assumes cooperation between stakeholders
- 2019 Costs include base construction, sales tax, contractor mark-up, subcontractor mark-up (30.68% combined) & allocated contingency (30%).
- Estimate assumes a Design-Bid-Build project delivery
- Estimate assumes maintaining operation of the station facility during construction
- Assumes construction duration of 28 months
- 30% Professional Services (FTA SCC 80)
- 30% Unallocated contingency
- WMATA force account labor/equipment during track outages and/or adjacent active track work (included in Professional Services)
- RRP (Railroad Protective Liability) insurance is included
- Mid-Point escalation is assumed to be 4% per year
- Work is assumed to be done either before the development work or in conjunction with the development work.
- ROW costs are assumed to be \$0.
- Assume 12 months for Agreement, 12 months for Design, 3 months to bid. 2.25 yrs
- No hazardous or contaminated material mitigation is included
- No articles of historic significance are expected to be discovered
- Take-off and scope of work based on drawings dated 4-30-19
- All estimates assume cast-in-place concrete and not steel or precast concrete
- Appropriate fire protection and controls are included.



AECOM  
 Gulf Tower  
 707 Grant Street  
 Pittsburgh, PA 15219

**Project: White Flint Station - New North Entrance**  
 Location: Montgomery County, MD  
 Client: WMATA

11/11/2019

**Schematic Design**

**Estimate Summary - Alternate 1**

Division	Description	% of Costs	Total
1	General Conditions	0.00%	\$ -
2	Existing Conditions	2.93%	\$ 273,074
3	Concrete	18.49%	\$ 1,722,211
4	Masonry	0.00%	\$ -
5	Metals	1.38%	\$ 128,431
6	Wood, Lumber, and Composites	0.00%	\$ -
7	Thermal and Moisture Protection	2.18%	\$ 203,177
8	Openings	13.72%	\$ 1,278,437
9	Finishes	3.89%	\$ 362,499
10	Specialties	0.00%	\$ -
11	Equipment	0.00%	\$ -
12	Furnishings	0.59%	\$ 55,099
13	Special Construction	0.00%	\$ -
14	Conveying Systems	17.18%	\$ 1,600,000
21	Fire Suppression	0.28%	\$ 25,651
22	Plumbing	3.40%	\$ 316,717
23	Heating, Ventilating, and Air Conditioning	0.40%	\$ 37,000
26	Electrical	6.48%	\$ 603,668
27	Communications	0.17%	\$ 16,251
28	Electronic Safety and Security	1.14%	\$ 106,308
31	Earthwork	1.82%	\$ 169,989
32	Exterior Improvements	1.17%	\$ 109,074
33	Utilities	4.74%	\$ 441,984
34	Transportation	20.03%	\$ 1,865,533
<b>Subtotal</b>			<b>\$ 9,315,103</b>
General Conditions		15.00%	\$ 1,397,266
Security Allowance		3.00%	\$ 279,453
Phasing Requirements		Not Required	0.00% \$ -
<b>Subtotal</b>			<b>\$ 10,991,822</b>
Mid Project Escalation		Included in Summary Comparison	0.00% \$ -
<b>Subtotal</b>			<b>\$ 10,991,822</b>
General Contractor Overhead		10.00%	\$ 1,099,182
General Contractor Profit		10.00%	\$ 1,099,182
<b>Subtotal</b>			<b>\$ 13,190,187</b>
Bonds and Insurance		2.00%	\$ 263,804
<b>Subtotal</b>			<b>\$ 13,453,990</b>
Allocated Contingency		30.00%	\$ 4,036,197
Unallocated Contingency		Included in Summary Comparison	0.00% \$ -
<b>Total Construction Costs</b>			<b>\$ 17,490,187</b>
Professional Services		Included in Summary Comparison	0.00% \$ -
<b>Total Cost</b>			<b>\$ 17,490,187</b>



AECOM White Flint Station - New North Entrance  
 Gulf Tower Location: Montgomery County, MD  
 707 Grant Street Client: WMATA  
 Pittsburgh, PA 15219

Estimate by: SS 11/11/2019  
 Checked by: KS 11/11/2019

13.00 Estimate Detail - Alternate 1

Item #	Description	Quantity	UOM	MH/Unit	Tot. Hours	Crew	\$/MH	Labor	Labor Total	Material	Material Total	Equipment	Equipment Total	Other	Other Total	Unit Cost	Subtotal	Sub Markups	Total Cost	
<b>001 General Conditions</b>																				
<b>001 General Conditions Total</b>																			\$	-
<b>002 Existing Conditions</b>																				
2.001	Elevator Pits Demo	36.94	CUYD	4.80	177.33	B10M	\$ 45.13	\$ 216.63	\$ 8,003.22	\$0.00	\$ -	\$ 134.29	\$ 4,961.11	\$ -	\$ -	\$ -	\$ 350.91	\$ 12,964.33	0.00%	\$ 12,964.33
2.002	Existing Slab Demo	6.17	CUYD	4.00	24.67	CONC001	\$ 48.34	\$ 193.37	\$ 1,192.47	\$0.00	\$ -	\$ 131.67	\$ 811.94	\$ -	\$ -	\$ -	\$ 325.04	\$ 2,004.42	0.00%	\$ 2,004.42
2.003	Existing Pylon Type A-1 Demo	3.00	EA	4.00	12.00	CARP	\$ 49.28	\$ 197.12	\$ 591.35	\$0.00	\$ -	\$ 1,300.00	\$ 3,900.00	\$ -	\$ -	\$ -	\$ 1,497.12	\$ 4,491.35	0.00%	\$ 4,491.35
2.004	Existing Sheltered Bench Demo	2.00	EA	8.00	16.00	CARP	\$ 49.28	\$ 394.24	\$ 788.47	\$0.00	\$ -	\$ 1,300.00	\$ 2,600.00	\$ -	\$ -	\$ -	\$ 1,694.24	\$ 3,388.47	0.00%	\$ 3,388.47
2.005	Trackside Safety Fence	1000.00	LF	0.50	500.00	CARP	\$ 49.28	\$ 24.64	\$ 24,639.77	\$35.00	\$ 35,000.00	\$ 0.65	\$ 650.00	\$ -	\$ -	\$ -	\$ 60.29	\$ 60,289.77	0.00%	\$ 60,289.77
2.006	Platform Slab Opening - cut & place back once piles, footing and column complete	210.00	SF	0.50	105.00	B10M	\$ 81.20	\$ 40.60	\$ 8,526.26	\$30.00	\$ 6,300.00	\$ 33.40	\$ 7,014.00	\$ -	\$ -	\$ -	\$ 104.00	\$ 21,840.26	0.00%	\$ 21,840.26
2.007	Core through Invert Slab	70.00	SF	1.20	84.00	B10M	\$ 81.20	\$ 97.44	\$ 6,821.01	\$0.00	\$ -	\$ 394.00	\$ 27,580.00	\$ -	\$ -	\$ -	\$ 491.44	\$ 34,401.01	0.00%	\$ 34,401.01
2.008	Temporary Shoring btw platform and invert slab	576.00	SF	0.33	190.08	B10M	\$ 81.20	\$ 26.80	\$ 15,434.97	\$15.00	\$ 8,640.00	\$ 16.70	\$ 9,619.20	\$ -	\$ -	\$ -	\$ 58.50	\$ 33,694.17	0.00%	\$ 33,694.17
2.009	Monitoring of Surrounding Structure	1.00	ALLOW	0.00	0.00	B10M	\$ 81.20	\$ -	\$ -	\$0.00	\$ -	\$ -	\$ -	\$ 100,000.00	\$ 100,000.00	\$ -	\$ 100,000.00	\$ 100,000.00	0.00%	\$ 100,000.00
<b>002 Existing Conditions Total</b>																			\$	273,073.79
<b>003 Concrete</b>																				
<b>Mezzanine Level:</b>																				
3.001	Floor - Elevator Mezz Area, 8" depth	76.53	CUYD	5.00	382.67	CONC001	\$ 48.34	\$ 241.72	\$ 18,499.42	\$290.12	\$ 22,204.16	\$ 60.00	\$ 4,592.00	\$ -	\$ -	\$ -	\$ 591.84	\$ 45,295.58	0.00%	\$ 45,295.58
3.002	Concrete Floor Beams	54.67	CUYD	6.00	328.00	IRON	\$ 76.94	\$ 461.66	\$ 25,237.54	\$290.00	\$ 15,853.33	\$ 450.00	\$ 24,600.00	\$ -	\$ -	\$ -	\$ 1,201.66	\$ 65,690.87	0.00%	\$ 65,690.87
3.003	Double-Wide 10' Stairs	367.65	SF	0.50	183.82	CONC001	\$ 48.34	\$ 24.17	\$ 8,886.67	\$35.00	\$ 12,867.67	\$ 4.29	\$ 1,575.63	\$ -	\$ -	\$ -	\$ 63.46	\$ 23,329.97	0.00%	\$ 23,329.97
3.004	Concrete Columns, 2.5' x 2.5'	22.92	CUYD	20.00	458.33	CONC001	\$ 48.34	\$ 966.87	\$ 22,157.41	\$290.12	\$ 6,648.68	\$ 200.00	\$ 4,583.33	\$ -	\$ -	\$ -	\$ 1,456.99	\$ 33,389.42	0.00%	\$ 33,389.42
3.005	Floor, 12" Slab on grade w/ 4" finish	229.75	CUYD	5.00	1148.74	CONC001	\$ 48.34	\$ 241.72	\$ 55,533.98	\$290.12	\$ 66,655.36	\$ 20.00	\$ 4,594.96	\$ -	\$ -	\$ -	\$ 551.84	\$ 126,784.30	0.00%	\$ 126,784.30
3.006	Concrete Grade Beams	27.62	CUYD	15.00	414.33	CONC001	\$ 48.34	\$ 725.15	\$ 20,030.30	\$290.00	\$ 8,010.44	\$ 205.56	\$ 5,677.90	\$ -	\$ -	\$ -	\$ 1,220.71	\$ 33,718.64	0.00%	\$ 33,718.64
3.007	Exterior Walls	32.73	CUYD	10.00	327.33	CONC001	\$ 48.34	\$ 483.43	\$ 15,824.42	\$290.12	\$ 9,496.73	\$ 200.00	\$ 6,546.67	\$ -	\$ -	\$ -	\$ 973.56	\$ 31,867.81	0.00%	\$ 31,867.81
3.008	8" Interior Walls	54.84	CUYD	10.00	548.44	CONC001	\$ 48.34	\$ 483.43	\$ 26,513.69	\$290.12	\$ 15,911.69	\$ 200.00	\$ 10,968.89	\$ -	\$ -	\$ -	\$ 973.56	\$ 53,394.27	0.00%	\$ 53,394.27
3.009	6" Interior Walls	18.22	CUYD	10.00	182.17	CONC001	\$ 48.34	\$ 483.43	\$ 8,806.56	\$290.12	\$ 5,285.09	\$ 200.00	\$ 3,643.33	\$ -	\$ -	\$ -	\$ 973.56	\$ 17,734.99	0.00%	\$ 17,734.99
3.010	Sidewalk	2600.00	SF	0.05	130.00	CONC001	\$ 48.34	\$ 2.42	\$ 6,284.65	\$10.00	\$ 26,000.00	\$ 1.09	\$ 2,846.72	\$ -	\$ -	\$ -	\$ 13.51	\$ 35,131.36	0.00%	\$ 35,131.36
<b>Platform Level:</b>																				
3.011	Elevator Pits	36.94	CUYD	6.00	221.67	CONC001	\$ 48.34	\$ 290.06	\$ 10,716.13	\$290.00	\$ 10,713.89	\$ 50.00	\$ 1,847.22	\$ -	\$ -	\$ -	\$ 630.06	\$ 23,277.24	0.00%	\$ 23,277.24
3.012	Drilled Shafts, 48"	84.00	VLF	5.00	420.00	PILE	\$ 64.54	\$ 322.71	\$ 27,107.35	\$158.24	\$ 13,292.43	\$ 166.67	\$ 14,000.00	\$ -	\$ -	\$ -	\$ 647.62	\$ 54,399.77	0.00%	\$ 54,399.77
3.013	Concrete Columns, 1.5' x 1.5'	21.00	CUYD	18.00	378.00	CONC001	\$ 48.34	\$ 870.18	\$ 18,273.82	\$290.12	\$ 6,092.61	\$ 214.29	\$ 4,500.00	\$ -	\$ -	\$ -	\$ 1,374.59	\$ 28,866.42	0.00%	\$ 28,866.42
3.014	Concrete Columns, 2' x 2'	4.89	CUYD	20.00	97.78	CONC001	\$ 48.34	\$ 966.87	\$ 4,726.91	\$290.12	\$ 1,418.38	\$ 312.50	\$ 1,527.78	\$ -	\$ -	\$ -	\$ 1,569.49	\$ 7,673.08	0.00%	\$ 7,673.08
3.015	New Canopy Columns	9.00	CUYD	24.00	216.00	CONC001	\$ 48.34	\$ 1,160.24	\$ 10,442.18	\$290.12	\$ 2,611.12	\$ 500.00	\$ 4,500.00	\$ -	\$ -	\$ -	\$ 1,950.37	\$ 17,553.30	0.00%	\$ 17,553.30
3.016	Column Footing Grade Beam, 3'x3'x5' long	10.00	CUYD	20.00	200.00	CONC001	\$ 48.34	\$ 966.87	\$ 9,668.69	\$290.00	\$ 2,900.00	\$ 740.00	\$ 7,400.00	\$ -	\$ -	\$ -	\$ 1,996.87	\$ 19,968.69	0.00%	\$ 19,968.69
3.017	Micropiles 9" dia.	1440.00	VLF	0.80	1152.00	PILE	\$ 64.54	\$ 51.63	\$ 74,351.58	\$90.00	\$ 129,600.00	\$ 47.90	\$ 68,980.65	\$ -	\$ -	\$ -	\$ 189.54	\$ 272,932.22	0.00%	\$ 272,932.22
<b>Roof:</b>																				
3.018	Canopy Platform (match exist south canopy)	191.53	CUYD	8.00	1532.21	IRON	\$ 64.12	\$ 512.96	\$ 98,244.84	\$290.00	\$ 55,542.55	\$ 150.00	\$ 28,728.91	\$ -	\$ -	\$ -	\$ 952.96	\$ 182,516.30	0.00%	\$ 182,516.30
3.019	Canopy Longitudinal Beams	139.42	CUYD	8.00	1115.36	IRON	\$ 64.12	\$ 512.96	\$ 71,516.46	\$290.00	\$ 40,431.71	\$ 180.00	\$ 25,095.55	\$ -	\$ -	\$ -	\$ 982.96	\$ 137,043.72	0.00%	\$ 137,043.72
3.020	Canopy Primary Beams	36.00	CUYD	6.00	216.00	IRON	\$ 76.94	\$ 461.66	\$ 16,619.84	\$290.00	\$ 10,440.00	\$ 350.00	\$ 12,600.00	\$ -	\$ -	\$ -	\$ 1,101.66	\$ 39,659.84	0.00%	\$ 39,659.84
3.021	Canopy Secondary Beams	92.56	CUYD	6.50	601.61	IRON	\$ 76.94	\$ 500.13	\$ 46,290.19	\$290.00	\$ 26,841.11	\$ 250.00	\$ 23,138.89	\$ -	\$ -	\$ -	\$ 1,040.13	\$ 96,270.19	0.00%	\$ 96,270.19
3.022	Mezzanine Roof Framing	299.22	CUYD	8.00	2393.78	IRON	\$ 64.12	\$ 512.96	\$ 153,488.46	\$290.00	\$ 86,774.44	\$ 90.00	\$ 26,930.00	\$ -	\$ -	\$ -	\$ 892.96	\$ 267,192.90	0.00%	\$ 267,192.90
3.023	Mezzanine Roof Slab, 6"	155.20	CUYD	6.50	1008.79	CONC001	\$ 48.34	\$ 314.23	\$ 48,768.53	\$290.00	\$ 45,007.70	\$ 95.00	\$ 14,743.90	\$ -	\$ -	\$ -	\$ 699.23	\$ 108,520.13	0.00%	\$ 108,520.13
<b>003 Concrete Total</b>																			\$	1,722,211.02
<b>004 Masonry</b>																				
<b>004 Masonry Total</b>																			\$	-
<b>005 Metals</b>																				
<b>Mezzanine Level:</b>																				
5.001	Stairs Railing	110.29	LF	0.25	27.57	IRON	\$ 64.12	\$ 16.03	\$ 1,768.01	\$200.00	\$ 22,058.86	\$ 8.64	\$ 952.54	\$ -	\$ -	\$ -	\$ 224.67	\$ 24,779.41	0.00%	\$ 24,779.41
5.002	Balustrades	637.70	SF	0.33	210.44	IRON	\$ 64.12	\$ 21.16	\$ 13,493.43	\$125.00	\$ 79,712.50	\$ 6.33	\$ 4,038.77	\$ -	\$ -	\$ -	\$ 152.49	\$ 97,244.69	0.00%	\$ 97,244.69
5.003	Fare Gate Railing	30.80	LF	0.13	3.85	IRON	\$ 64.12	\$ 8.01	\$ 246.86	\$200.00	\$ 6,160.00	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 208.01	\$ 6,406.86	0.00%	\$ 6,406.86
5.004	Bike Storage Facility - Excluded	1.00	LS	0.00	0.00	IRON	\$ 64.12	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00%	\$ -
<b>005 Metals Total</b>																			\$	128,430.96
<b>006 Wood and Plastics</b>																				
<b>006 Wood and Plastics Total</b>																			\$	-
<b>007 Thermal and Moisture Protection</b>																				
7.001	Waterproofing	9302.79	SF	0.25	2325.70	B10M	\$ 45.13	\$ 11.28	\$ 104,960.86	\$10.00	\$ 93,027.90	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 21.28	\$ 197,988.76	0.00%	\$ 197,988.76
7.002	Waterproofing Seal - micropile and invert slab	70.00	SF	0.68	47.60	B10M	\$ 45.13	\$ 30.69	\$ 2,148.23	\$30.00	\$ 2,100.00	\$ 13.43	\$ 940.00	\$ -	\$ -	\$ -	\$ 74.12	\$ 5,188.23	0.00%	\$ 5,188.23
<b>007 Thermal and Moisture Protection Total</b>																			\$	203,176.99
<b>008 Openings</b>																				
<b>Mezzanine Level:</b>																				
8.001	Elevator #1 Enclosure	1398.25	SF	0.07	93.68	GLAZ	\$ 51.64	\$ 3.46	\$ 4,838.11	\$200.00	\$ 279,649.78	\$ 1.06	\$ 1,475.93	\$ -	\$ -	\$ -	\$ 204.52	\$ 285,963.82	0.00%	\$ 285,963.82
8.002	Elevator #2 Enclosure	1398.25	SF	0.07	93.68	GLAZ	\$ 51.64	\$ 3.46	\$ 4,838.11	\$200.00	\$ 279,649.78	\$ 1.06	\$ 1,475.93	\$ -	\$ -	\$ -	\$ 204.52	\$ 285,963.82	0.00%	\$ 285,963.82
8.003	Interior Doors	10.00	EA	9.00	90.00	CARP	\$ 49.28	\$ 443.52	\$ 4,435.16	\$4,000.00	\$ 40,000.00	\$ 50.00	\$ 500.00	\$ -	\$ -	\$ -	\$ 4,493.52	\$ 44,935.16	0.00%	\$ 44,935.16
8.003	Entry Gates	3.00	EA	24.00	72.00	CARP	\$ 49.28	\$ 1,182.71	\$ 3,548.13	\$8,000.00	\$ 24,000.00	\$ 475.00	\$ 1,425.00	\$ -	\$ -	\$ -	\$ 9,657.71	\$ 28,973.13	0.00%	\$ 28,973.13
<b>Roof:</b>																				
8.004	Canopy Skylight	1773.71	SF	0.10	177.37	GLAZ	\$ 51.64	\$ 5.16	\$ 9,160.10	\$200.00	\$ 354,742.61	\$ 1.58	\$ 2,808.38	\$ -	\$ -	\$ -	\$ 206.75	\$ 366,711.09	0.00%	\$ 366,711.09
8.005	Mezzanine Roof Skylight	1286.06	SF	0.10	128.61	GLAZ	\$ 51.64	\$ 5.16	\$ 6,641.67	\$200.00	\$ 257,211.60	\$ 1.58	\$ 2,036.26	\$ -	\$ -	\$ -	\$ 206.75	\$ 265,889.53	0.00%	\$ 265,889.53
<b>008 Openings Total</b>																			\$	1,278,436.55
<b>009 Finishes</b>																				
9.001	New Mezzanine Finishes	8562.79	SF	0.25	2140.70	TILE	\$ 47.55	\$ 11.89	\$ 101,782.29	\$25.00	\$ 214,069.75	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 36.89	\$ 315,852.04	0.00%	\$ 315,852.04



AECOM White Flint Station - New North Entrance  
 Gulf Tower Location: Montgomery County, MD  
 707 Grant Street Client: WMATA  
 Pittsburgh, PA 15219

Estimate by: SS 11/11/2019  
 Checked by: KS 11/11/2019

13.00 Estimate Detail - Alternate 1

Item #	Description	Quantity	UOM	MH/Unit	Tot. Hours	Crew	\$/MH	Labor	Labor Total	Material	Material Total	Equipment	Equipment Total	Other	Other Total	Unit Cost	Subtotal	Sub Markups	Total Cost		
<b>009 Finishes Total</b>																				\$	362,499.47
<b>010 Specialities</b>																					
<b>011 Equipment</b>																					
<b>012 Furnishings</b>																					
12.001	Benches	10.00	EA	0.10	1.00	CARP	\$ 49.28	\$ 4.93	\$ 49.28	\$4,000.00	\$ 40,000.00			\$ -	\$ -	\$ -	4,004.93	\$ 40,049.28	0.00%	\$ 40,049.28	
12.002	Waste and recycling containers	10.00	EA	0.10	1.00	CARP	\$ 49.28	\$ 4.93	\$ 49.28	\$1,500.00	\$ 15,000.00			\$ -	\$ -	\$ -	1,504.93	\$ 15,049.28	0.00%	\$ 15,049.28	
<b>013 Special Construction</b>																					
<b>014 Conveying Systems</b>																					
14.001	Elevators	2.00	EA	0.00	0.00	B10M	\$ 45.13	\$ -	\$ -	\$800,000.00	\$ 1,600,000.00			\$ -	\$ -	\$ -	800,000.00	\$ 1,600,000.00	0.00%	\$ 1,600,000.00	
<b>021 Fire Suppression</b>																					
21.001	FA Notification Device	9	EACH	1.20	10.80	ELEC	\$ 75.14	\$ 90.16	\$ 811.47	\$75.00	\$ 675.00			\$ -	\$ -	\$ -	165.16	\$ 1,486.47	0.00%	\$ 1,486.47	
21.002	FA Initiation Device	6	EACH	1.20	7.20	ELEC	\$ 75.14	\$ 90.16	\$ 540.98	\$75.00	\$ 450.00			\$ -	\$ -	\$ -	165.16	\$ 990.98	0.00%	\$ 990.98	
21.003	FA Equipment	1	ALLOW	29.96	29.96	ELEC	\$ 75.14	\$ 2,251.37	\$ 2,251.37	\$3,000.00	\$ 3,000.00			\$ -	\$ -	\$ -	5,251.37	\$ 5,251.37	0.00%	\$ 5,251.37	
21.004	Fire Alarm Wiring	2000	LNFT	0.08	160.00	ELEC	\$ 75.14	\$ 6.01	\$ 12,022.33	\$1.00	\$ 2,000.00			\$ -	\$ -	\$ -	7.01	\$ 14,022.33	0.00%	\$ 14,022.33	
21.005	FA Test & Check System	1	ALLOW	0.00	0.00	ELEC	\$ 75.14	\$ -	\$ -	\$1,500.00	\$ 1,500.00			\$ -	\$ -	\$ -	1,500.00	\$ 1,500.00	0.00%	\$ 1,500.00	
21.006	FA Programming/ Engineering	1	ALLOW	0.00	0.00	ELEC	\$ 75.14	\$ -	\$ -	\$2,400.00	\$ 2,400.00			\$ -	\$ -	\$ -	2,400.00	\$ 2,400.00	0.00%	\$ 2,400.00	
<b>022 Plumbing</b>																					
22.001	Restrooms	3.00	EA	64.00	192.00	PLUM	\$ 71.88	\$ 4,600.58	\$ 13,801.75	\$8,000.00	\$ 24,000.00	\$ 1,000.00	\$ 3,000.00		\$ -	\$ -	13,600.58	\$ 40,801.75	0.00%	\$ 40,801.75	
22.002	Plumbing	9302.79	SF	0.35	3255.98	PLUM	\$ 71.88	\$ 25.16	\$ 234,053.02	\$4.50	\$ 41,862.56			\$ -	\$ -	\$ -	29.66	\$ 275,915.57	0.00%	\$ 275,915.57	
<b>023 HVAC</b>																					
23.001	HVAC	740	SF	0.00	0.00	ELEC	\$ 75.14	\$ -	\$ -	\$ -	\$ -	\$ 50.00	\$ 37,000.00		\$ -	\$ -	50.00	\$ 37,000.00	0.00%	\$ 37,000.00	
<b>026 Electrical</b>																					
26.001	Motor Control Center	1	EACH	35.00	35.00	ELEC	\$ 75.14	\$ 2,629.88	\$ 2,629.88	\$24,000.00	\$ 24,000.00			\$ -	\$ -	\$ -	26,629.88	\$ 26,629.88	0.00%	\$ 26,629.88	
26.002	Primary Circuit Protection For MCC	1	EACH	12.00	12.00	ELEC	\$ 75.14	\$ 901.67	\$ 901.67	\$5,500.00	\$ 5,500.00			\$ -	\$ -	\$ -	6,401.67	\$ 6,401.67	0.00%	\$ 6,401.67	
26.003	MCC Distribution Feeder Conduit & Wire	300	LNFT	0.82	246.00	ELEC	\$ 75.14	\$ 61.62	\$ 18,484.55	\$47.94	\$ 14,382.00			\$ -	\$ -	\$ -	109.56	\$ 32,866.55	0.00%	\$ 32,866.55	
26.004	Power For Display Board	7	EACH	14.01	98.07	ELEC	\$ 75.14	\$ 1,052.74	\$ 7,369.20	\$210.00	\$ 1,470.00			\$ -	\$ -	\$ -	1,262.74	\$ 8,839.20	0.00%	\$ 8,839.20	
26.005	Power To Elevator	2	EACH	34.93	69.87	ELEC	\$ 75.14	\$ 2,624.96	\$ 5,249.92	\$1,800.00	\$ 3,600.00			\$ -	\$ -	\$ -	4,424.96	\$ 8,849.92	0.00%	\$ 8,849.92	
26.006	Power To Elevator Sump Pump	2	EACH	21.00	41.99	ELEC	\$ 75.14	\$ 1,577.73	\$ 3,155.47	\$450.00	\$ 900.00			\$ -	\$ -	\$ -	2,027.73	\$ 4,055.47	0.00%	\$ 4,055.47	
26.007	Power To Base Board Heater	8	EACH	15.01	120.08	ELEC	\$ 75.14	\$ 1,127.80	\$ 9,022.38	\$220.00	\$ 1,760.00			\$ -	\$ -	\$ -	1,347.80	\$ 10,782.38	0.00%	\$ 10,782.38	
26.008	Power To Ventilation Unit	6	EACH	20.00	120.00	ELEC	\$ 75.14	\$ 1,502.79	\$ 9,016.74	\$400.00	\$ 2,400.00			\$ -	\$ -	\$ -	1,902.79	\$ 11,416.74	0.00%	\$ 11,416.74	
26.009	Emergency Power Tie Into Existing System ( Elevator, etc.)	1	ALLOW	60.00	60.00	ELEC	\$ 75.14	\$ 4,508.37	\$ 4,508.37	\$2,000.00	\$ 2,000.00			\$ -	\$ -	\$ -	6,508.37	\$ 6,508.37	0.00%	\$ 6,508.37	
26.010	Canopy LED Light Fixture	42	EACH	1.20	50.40	ELEC	\$ 75.14	\$ 90.16	\$ 3,786.84	\$385.00	\$ 16,170.00			\$ -	\$ -	\$ -	475.16	\$ 19,956.84	0.00%	\$ 19,956.84	
26.011	Platform Edge Light	84	EACH	1.50	126.01	ELEC	\$ 75.14	\$ 112.72	\$ 9,468.15	\$220.00	\$ 18,480.00			\$ -	\$ -	\$ -	332.72	\$ 27,948.15	0.00%	\$ 27,948.15	
26.012	North Entrance Mezz Light	34	EACH	1.20	40.80	ELEC	\$ 75.14	\$ 90.16	\$ 3,065.54	\$285.00	\$ 9,690.00			\$ -	\$ -	\$ -	375.16	\$ 12,755.54	0.00%	\$ 12,755.54	
26.013	Exterior Light	12	EACH	1.20	14.40	ELEC	\$ 75.14	\$ 90.16	\$ 1,081.96	\$185.00	\$ 2,220.00			\$ -	\$ -	\$ -	275.16	\$ 3,301.96	0.00%	\$ 3,301.96	
26.014	Walkway Pole Light & Base	8	EACH	12.00	96.00	ELEC	\$ 75.14	\$ 901.67	\$ 7,213.40	\$1,800.00	\$ 14,400.00			\$ -	\$ -	\$ -	2,701.67	\$ 21,613.40	0.00%	\$ 21,613.40	
26.015	Room Light LEDs	9	EACH	1.20	10.80	ELEC	\$ 75.14	\$ 90.16	\$ 811.47	\$220.00	\$ 1,980.00			\$ -	\$ -	\$ -	310.16	\$ 2,791.47	0.00%	\$ 2,791.47	
26.016	Exit Sign	5	EACH	1.00	5.00	ELEC	\$ 75.14	\$ 75.14	\$ 375.70	\$225.00	\$ 1,125.00			\$ -	\$ -	\$ -	300.14	\$ 1,500.70	0.00%	\$ 1,500.70	
26.017	Lighting Control	1	ALLOW	30.00	30.00	ELEC	\$ 75.14	\$ 2,254.19	\$ 2,254.19	\$1,000.00	\$ 1,000.00			\$ -	\$ -	\$ -	3,254.19	\$ 3,254.19	0.00%	\$ 3,254.19	
26.018	Emergency Lighting- Tie Into Existing System	1	ALLOW	80.00	80.00	ELEC	\$ 75.14	\$ 6,011.16	\$ 6,011.16	\$2,500.00	\$ 2,500.00			\$ -	\$ -	\$ -	8,511.16	\$ 8,511.16	0.00%	\$ 8,511.16	
26.019	Light Fixture Conduit & Wire	4800	LNFT	0.18	864.00	ELEC	\$ 75.14	\$ 13.53	\$ 64,920.56	\$1.20	\$ 5,760.00			\$ -	\$ -	\$ -	14.73	\$ 70,680.56	0.00%	\$ 70,680.56	
26.020	Duplex Receptacle	19	EACH	0.80	15.20	ELEC	\$ 75.14	\$ 60.11	\$ 1,142.12	\$22.00	\$ 418.00			\$ -	\$ -	\$ -	82.11	\$ 1,560.12	0.00%	\$ 1,560.12	
26.021	Duplex Receptacle GFI	6	EACH	1.00	6.00	ELEC	\$ 75.14	\$ 75.14	\$ 450.84	\$34.00	\$ 204.00			\$ -	\$ -	\$ -	109.14	\$ 654.84	0.00%	\$ 654.84	
26.022	Quad Duplex Receptacle	4	EACH	1.20	4.80	ELEC	\$ 75.14	\$ 90.16	\$ 360.65	\$44.00	\$ 176.00			\$ -	\$ -	\$ -	134.16	\$ 536.65	0.00%	\$ 536.65	
26.023	Duplex Receptacle GFI WP	6	EACH	1.20	7.20	ELEC	\$ 75.14	\$ 90.16	\$ 540.98	\$58.00	\$ 348.00			\$ -	\$ -	\$ -	148.16	\$ 888.98	0.00%	\$ 888.98	
26.024	Receptacle Conduit & Wire	1400	LNFT	0.18	252.00	ELEC	\$ 75.14	\$ 13.53	\$ 18,935.16	\$1.20	\$ 1,680.00			\$ -	\$ -	\$ -	14.73	\$ 20,615.16	0.00%	\$ 20,615.16	
26.025	Existing Etec Demo & Relocation	2	EA	132.00	264.00	ELEC	\$ 75.14	\$ 9,918.42	\$ 19,836.84	\$0.00	\$ -	\$ 1,200.00	\$ 2,400.00		\$ -	\$ -	11,118.42	\$ 22,236.84	0.00%	\$ 22,236.84	
26.026	Commissioning	1	LS	80.00	80.00	ELEC	\$ 75.14	\$ 6,011.16	\$ 6,011.16	\$0.00	\$ -			\$ -	\$ -	\$ -	6,011.16	\$ 6,011.16	0.00%	\$ 6,011.16	
26.027	New Signage	1	LS	0.00	0.00	ELEC	\$ 75.14	\$ -	\$ -	\$0.00	\$ -	\$ -	\$ -	\$ 262,500.00	\$ 262,500.00	\$ -	262,500.00	\$ 262,500.00	0.00%	\$ 262,500.00	
<b>026 Electrical Total</b>																				\$	603,667.91
<b>027 Communications</b>																					
27.001	Data/Voice Outlet	6	EACH	2.50	15.00	ELEC	\$ 75.14	\$ 187.85	\$ 1,127.09	\$45.00	\$ 270.00			\$ -	\$ -	\$ -	232.85	\$ 1,397.09	0.00%	\$ 1,397.09	
27.002	Data/Voice Outlet Conduit & Wire	900	LNFT	0.18	162.00	ELEC	\$ 75.14	\$ 13.53	\$ 12,172.61	\$1.20	\$ 1,080.00			\$ -	\$ -	\$ -	14.73	\$ 13,252.61	0.00%	\$ 13,252.61	
27.003	Work At IT Existing Rack	1	ALLOW	8.00	8.00	ELEC	\$ 75.14	\$ 601.12	\$ 601.12	\$1,000.00	\$ 1,000.00			\$ -	\$ -	\$ -	1,601.12	\$ 1,601.12	0.00%	\$ 1,601.12	
<b>028 Security Systems</b>																					
28.001	Speaker	29	EACH	2.00	58.00	ELEC	\$ 75.14	\$ 150.28	\$ 4,358.09	\$145.00	\$ 4,205.00			\$ -	\$ -	\$ -	295.28	\$ 8,563.09	0.00%	\$ 8,563.09	
28.002	Sound System Front End Equipment	1	ALLOW	24.02	24.02	ELEC	\$ 75.14	\$ 1,805.15	\$ 1,805.15	\$4,500.00	\$ 4,500.00			\$ -	\$ -	\$ -	6,305.15	\$ 6,305.15	0.00%	\$ 6,305.15	
28.003	Speaker Conduit & Wire	1600	LNFT	0.18	288.00	ELEC	\$ 75.14	\$ 13.53	\$ 21,640.19	\$1.00	\$ 1,600.00			\$ -	\$ -	\$ -	14.53	\$ 23,240.19	0.00%	\$ 23,240.19	
28.004	Camera	17	EACH	4.00	68.00	ELEC	\$ 75.14	\$ 300.56	\$ 5,109.49	\$1,000.00	\$ 17,000.00			\$ -	\$ -	\$ -	1,300.56	\$ 22,109.49	0.00%	\$ 22,109.49	
28.005	Camera Conduit & Wire	2600	LNFT	0.18	468.00	ELEC	\$ 75.14	\$ 13.53	\$ 35,165.30	\$1.20	\$ 3,120.00			\$ -	\$ -	\$ -	14.73	\$ 38,285.30	0.00%	\$ 38,285.30	
28.006	Video Front End Equipment	1	ALLOW	24.02	24.02	ELEC	\$ 75.14	\$ 1,805.15	\$ 1,805.15	\$6,000.00	\$ 6,000.00			\$ -	\$ -	\$ -	7,805.15	\$ 7,805.15	0.00%	\$ 7,805.15	
<b>031 Earthwork</b>																					
31.001	Compacted Backfill	64.20	CUYD	0.10	6.42	EOM	\$ 47.80	\$ 4.78	\$ 306.90	\$26.00	\$ 1,669.20	\$ 25.23	\$ 1,619.82		\$ -	\$ -	56.01	\$ 3,595.92	0.00%	\$ 3,595.92	





AECOM White Flint Station - New North Entrance  
 Gulf Tower Location: Montgomery County, MD  
 707 Grant Street Client: WMATA  
 Pittsburgh, PA 15219

Estimate by: SS 11/11/2019  
 Checked by: KS 11/11/2019

13.00 Estimate Detail - Alternate 1

Item #	Description	Quantity	UOM	MH/Unit	Tot. Hours	Crew	\$/MH	Labor	Labor Total	Material	Material Total	Equipment	Equipment Total	Other	Other Total	Unit Cost	Subtotal	Sub Markups	Total Cost	
31.002	Excavation	344.55	CUYD	0.10	34.45	B10M	\$ 45.13	\$ 4.51	\$ 1,554.98	\$0.00	\$ -	\$ 10.00	\$ 3,445.48	\$ -	\$ -	\$ -	14.51	\$ 5,000.45	0.00%	\$ 5,000.45
31.003	Pressure Grouting - drilling, grout and pressure pumping	1440.00	VLF	0.50	720.00	B10M	\$ 54.16	\$ 27.08	\$ 38,993.11	\$50.00	\$ 72,000.00	\$ 35.00	\$ 50,400.00	\$ -	\$ -	\$ -	112.08	\$ 161,393.11	0.00%	\$ 161,393.11
<b>031 Earthwork Total</b>																			\$	<b>169,989.48</b>
<b>032 Exterior Improvements</b>																				
32.001	Landscaping	1.00	ALLOW	120.00	120.00	LABOR	\$ 39.78	\$ 4,774.17	\$ 4,774.17	\$100,000.00	\$ 100,000.00	\$ 4,300.00	\$ 4,300.00	\$ -	\$ -	\$ -	109,074.17	\$ 109,074.17	0.00%	\$ 109,074.17
<b>032 Exterior Improvements Total</b>																			\$	<b>109,074.17</b>
<b>033 Utilities</b>																				
33.001	Utility Relocation	1.00	ALLOW	0.00	0.00	B10M	\$ 45.13	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 400,000.00	\$ 400,000.00	\$ -	400,000.00	\$ 400,000.00	0.00%	\$ 400,000.00
33.002	Fire Protection Piping	9302.79	SF	0.10	930.28	B10M	\$ 45.13	\$ 4.51	\$ 41,984.35	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	4.51	\$ 41,984.35	0.00%	\$ 41,984.35
<b>033 Utilities Total</b>																			\$	<b>441,984.35</b>
<b>034 Transportation</b>																				
34.001	Ticket Vending Machines (TVM)	8.00	EA	0.00	0.00	B10M	\$ 45.13	\$ -	\$ -	\$160,000.00	\$ 1,280,000.00	\$ -	\$ -	\$ -	\$ -	\$ -	160,000.00	\$ 1,280,000.00	0.00%	\$ 1,280,000.00
34.002	Fare Gates	5.00	EA	0.00	0.00	B10M	\$ 45.13	\$ -	\$ -	\$100,000.00	\$ 500,000.00	\$ -	\$ -	\$ -	\$ -	\$ -	100,000.00	\$ 500,000.00	0.00%	\$ 500,000.00
34.003	Station Manager Kiosk	1.00	EA	96.00	96.00	B10M	\$ 45.13	\$ 4,332.57	\$ 4,332.57	\$80,000.00	\$ 80,000.00	\$ 1,200.00	\$ 1,200.00	\$ -	\$ -	\$ -	85,532.57	\$ 85,532.57	0.00%	\$ 85,532.57
<b>034 Transportation Total</b>																			\$	<b>1,865,532.57</b>
																			\$	<b>9,315,103.49</b>



AECOM  
 Gulf Tower  
 707 Grant Street  
 Pittsburgh, PA 15219

**Project: White Flint Station - New North Entrance**  
 Location: Montgomery County, MD  
 Client: WMATA

11/11/2019

**Schematic Design**

**Estimate Summary - Alternate 2**

Division	Description	% of Costs	Total
1	General Conditions	0.00%	\$ -
2	Existing Conditions	0.92%	\$ 83,138
3	Concrete	18.33%	\$ 1,652,974
4	Masonry	0.00%	\$ -
5	Metals	1.42%	\$ 128,431
6	Wood, Lumber, and Composites	0.00%	\$ -
7	Thermal and Moisture Protection	2.20%	\$ 197,989
8	Openings	15.62%	\$ 1,408,469
9	Finishes	4.02%	\$ 362,499
10	Specialties	0.00%	\$ -
11	Equipment	0.00%	\$ -
12	Furnishings	0.61%	\$ 55,099
13	Special Construction	0.00%	\$ -
14	Conveying Systems	17.74%	\$ 1,600,000
21	Fire Suppression	0.28%	\$ 25,651
22	Plumbing	3.51%	\$ 316,717
23	Heating, Ventilating, and Air Conditioning	0.41%	\$ 37,000
26	Electrical	6.69%	\$ 603,668
27	Communications	0.18%	\$ 16,251
28	Electronic Safety and Security	1.18%	\$ 106,308
31	Earthwork	0.10%	\$ 8,596
32	Exterior Improvements	1.21%	\$ 109,074
33	Utilities	4.90%	\$ 441,984
34	Transportation	20.68%	\$ 1,865,533
<b>Subtotal</b>			<b>\$ 9,019,382</b>
General Conditions		15.00%	\$ 1,352,907
Security Allowance		3.00%	\$ 270,581
Phasing Requirements		Not Required	0.00% \$ -
<b>Subtotal</b>			<b>\$ 10,642,870</b>
Mid Project Escalation		Included in Summary Comparison	0.00% \$ -
<b>Subtotal</b>			<b>\$ 10,642,870</b>
General Contractor Overhead		10.00%	\$ 1,064,287
General Contractor Profit		10.00%	\$ 1,064,287
<b>Subtotal</b>			<b>\$ 12,771,444</b>
Bonds and Insurance		2.00%	\$ 255,429
<b>Subtotal</b>			<b>\$ 13,026,873</b>
Allocated Contingency		30.00%	\$ 3,908,062
Unallocated Contingency		Included in Summary Comparison	0.00% \$ -
<b>Total Construction Costs</b>			<b>\$ 16,934,935</b>
Professional Services		Included in Summary Comparison	0.00% \$ -
<b>Total Cost</b>			<b>\$ 16,934,935</b>



AECOM White Flint Station - New North Entrance  
 Gulf Tower Location: Montgomery County, MD  
 707 Grant Street Client: WMATA  
 Pittsburgh, PA 15219

Estimate by: SS 11/11/2019  
 Checked by: KS 11/11/2019

**13.00 Estimate Detail - Alternate 2**

Item #	Description	Quantity	UOM	MH/Unit	Tot. Hours	Crew	\$/MH	Labor	Labor Total	Material	Material Total	Equipment	Equipment Total	Other	Other Total	Unit Cost	Total Cost
<b>001 General Conditions</b>																	
<b>001 General Conditions Total</b>																	
<b>\$ -</b>																	
<b>002 Existing Conditions</b>																	
2.001	Elevator Pits Demo	36.94	CUYD	4.80	177.33	B10M	\$ 45.13	\$ 216.63	\$ 8,003.22	\$ 0.00	\$ -	\$ 134.29	\$ 4,961.11	\$ -	\$ -	\$ 350.91	\$ 12,964.33
2.002	Existing Slab Demo	6.17	CUYD	4.00	24.67	CONC001	\$ 48.34	\$ 193.37	\$ 1,192.47	\$ 0.00	\$ -	\$ 131.67	\$ 811.94	\$ -	\$ -	\$ 325.04	\$ 2,004.42
2.003	Existing Pylon Type A-1 Demo	3.00	EA	4.00	12.00	CARP	\$ 49.28	\$ 197.12	\$ 591.35	\$ 0.00	\$ -	\$ 1,300.00	\$ 3,900.00	\$ -	\$ -	\$ 1,497.12	\$ 4,491.35
2.004	Existing Sheltered Bench Demo	2.00	EA	8.00	16.00	CARP	\$ 49.28	\$ 394.24	\$ 788.47	\$ 0.00	\$ -	\$ 1,300.00	\$ 2,600.00	\$ -	\$ -	\$ 1,694.24	\$ 3,388.47
2.005	Trackside Safety Fence	1000.00	LF	0.50	500.00	CARP	\$ 49.28	\$ 24.64	\$ 24,639.77	\$ 35.00	\$ 35,000.00	\$ 0.65	\$ 650.00	\$ -	\$ -	\$ 60.29	\$ 60,289.77
<b>002 Existing Conditions Total</b>																	
<b>\$ 83,138.34</b>																	
<b>003 Concrete</b>																	
<b>Mezzanine Level:</b>																	
3.001	Floor - Elevator Mezz Area, 8" depth	76.53	CUYD	5.00	382.67	CONC001	\$ 48.34	\$ 241.72	\$ 18,499.42	\$ 290.12	\$ 22,204.16	\$ 60.00	\$ 4,592.00	\$ -	\$ -	\$ 591.84	\$ 45,295.58
3.002	Concrete Floor Beams	54.67	CUYD	6.00	328.00	IRON	\$ 76.94	\$ 461.66	\$ 25,237.54	\$ 290.00	\$ 15,853.33	\$ 450.00	\$ 24,600.00	\$ -	\$ -	\$ 1,201.66	\$ 65,690.87
3.003	Double-Wide 10' Stairs	367.65	SF	0.50	183.82	CONC001	\$ 48.34	\$ 24.17	\$ 8,886.67	\$ 35.00	\$ 12,867.67	\$ 4.29	\$ 1,575.63	\$ -	\$ -	\$ 63.46	\$ 23,329.97
3.004	Concrete Columns, 2.5' x 2.5'	22.92	CUYD	20.00	458.33	CONC001	\$ 48.34	\$ 966.87	\$ 22,157.41	\$ 290.12	\$ 6,648.68	\$ 200.00	\$ 4,583.33	\$ -	\$ -	\$ 1,456.99	\$ 33,389.42
3.005	Floor, 12" Slab on grade w/ 4" finish	229.75	CUYD	5.00	1148.74	CONC001	\$ 48.34	\$ 241.72	\$ 55,533.98	\$ 290.12	\$ 66,655.36	\$ 20.00	\$ 4,594.96	\$ -	\$ -	\$ 551.84	\$ 126,784.30
3.006	Concrete Grade Beams	27.62	CUYD	15.00	414.33	CONC001	\$ 48.34	\$ 725.15	\$ 20,030.30	\$ 290.00	\$ 8,010.44	\$ 205.56	\$ 5,677.90	\$ -	\$ -	\$ 1,220.71	\$ 33,718.64
3.007	Exterior Walls	32.73	CUYD	10.00	327.33	CONC001	\$ 48.34	\$ 483.43	\$ 15,824.42	\$ 290.12	\$ 9,496.73	\$ 200.00	\$ 6,546.67	\$ -	\$ -	\$ 973.56	\$ 31,867.81
3.008	8" Interior Walls	54.84	CUYD	10.00	548.44	CONC001	\$ 48.34	\$ 483.43	\$ 26,513.69	\$ 290.12	\$ 15,911.69	\$ 200.00	\$ 10,968.89	\$ -	\$ -	\$ 973.56	\$ 53,394.27
3.009	6" Interior Walls	18.22	CUYD	10.00	182.17	CONC001	\$ 48.34	\$ 483.43	\$ 8,806.56	\$ 290.12	\$ 5,285.09	\$ 200.00	\$ 3,643.33	\$ -	\$ -	\$ 973.56	\$ 17,734.99
3.010	Sidewalk	2600.00	SF	0.05	130.00	CONC001	\$ 48.34	\$ 2.42	\$ 6,284.65	\$ 10.00	\$ 26,000.00	\$ 1.09	\$ 2,846.72	\$ -	\$ -	\$ 13.51	\$ 35,131.36
<b>Platform Level:</b>																	
3.011	Elevator Pits	36.94	CUYD	6.00	221.67	CONC001	\$ 48.34	\$ 290.06	\$ 10,716.13	\$ 290.00	\$ 10,713.89	\$ 50.00	\$ 1,847.22	\$ -	\$ -	\$ 630.06	\$ 23,277.24
3.012	Drilled Shafts, 48"	84.00	VLF	5.00	420.00	PILE	\$ 64.54	\$ 322.71	\$ 27,107.35	\$ 158.24	\$ 13,292.43	\$ 166.67	\$ 14,000.00	\$ -	\$ -	\$ 647.62	\$ 54,399.77
3.013	Concrete Columns, 1.5' x 1.5'	3.00	CUYD	18.00	54.00	CONC001	\$ 48.34	\$ 870.18	\$ 2,610.55	\$ 290.12	\$ 870.37	\$ 500.00	\$ 1,500.00	\$ -	\$ -	\$ 1,660.31	\$ 4,980.92
3.014	Concrete Columns, 2' x 2'	4.89	CUYD	20.00	97.78	CONC001	\$ 48.34	\$ 966.87	\$ 4,726.91	\$ 290.12	\$ 1,418.38	\$ 312.50	\$ 1,527.78	\$ -	\$ -	\$ 1,569.49	\$ 7,673.08
3.015	Concrete Columns, 2.5' x 2.5'	55.56	CUYD	22.00	1222.22	CONC001	\$ 48.34	\$ 1,063.56	\$ 59,086.42	\$ 290.12	\$ 16,118.00	\$ 136.36	\$ 7,575.76	\$ -	\$ -	\$ 1,490.04	\$ 82,780.18
3.016	New Canopy Columns	9.00	CUYD	24.00	216.00	CONC001	\$ 48.34	\$ 1,160.24	\$ 10,442.18	\$ 290.12	\$ 2,611.12	\$ 500.00	\$ 4,500.00	\$ -	\$ -	\$ 1,950.37	\$ 17,553.30
<b>Roof:</b>																	
3.017	Canopy Platform (match exist south canopy)	191.53	CUYD	8.00	1532.21	IRON	\$ 64.12	\$ 512.96	\$ 98,244.84	\$ 290.00	\$ 55,542.55	\$ 150.00	\$ 28,728.91	\$ -	\$ -	\$ 952.96	\$ 182,516.30
3.018	Canopy Longitudinal Beams	139.42	CUYD	8.00	1115.36	IRON	\$ 64.12	\$ 512.96	\$ 71,516.46	\$ 290.00	\$ 40,431.71	\$ 180.00	\$ 25,095.55	\$ -	\$ -	\$ 982.96	\$ 137,043.72
3.019	Canopy Primary Beams	36.00	CUYD	6.00	216.00	IRON	\$ 76.94	\$ 461.66	\$ 16,619.84	\$ 290.00	\$ 10,440.00	\$ 350.00	\$ 12,600.00	\$ -	\$ -	\$ 1,101.66	\$ 39,659.84
3.020	Canopy Secondary Beams	92.56	CUYD	6.50	601.61	IRON	\$ 76.94	\$ 500.13	\$ 46,290.19	\$ 290.00	\$ 26,841.11	\$ 250.00	\$ 23,138.89	\$ -	\$ -	\$ 1,040.13	\$ 96,270.19
3.021	Mezzanine Roof Framing	529.48	CUYD	7.00	3706.37	IRON	\$ 64.12	\$ 448.84	\$ 237,651.58	\$ 290.00	\$ 153,549.63	\$ 75.00	\$ 39,711.11	\$ -	\$ -	\$ 813.84	\$ 430,912.32
3.022	Mezzanine Roof Slab, 6"	156.70	CUYD	6.50	1018.55	CONC001	\$ 48.34	\$ 314.23	\$ 49,240.15	\$ 290.00	\$ 45,442.95	\$ 95.00	\$ 14,886.48	\$ -	\$ -	\$ 699.23	\$ 109,569.58
<b>003 Concrete Total</b>																	
<b>\$ 1,652,973.65</b>																	
<b>004 Masonry</b>																	
<b>004 Masonry Total</b>																	
<b>\$ -</b>																	
<b>005 Metals</b>																	
<b>Mezzanine Level:</b>																	
5.001	Stairs Railing	110.29	LF	0.25	27.57	IRON	\$ 64.12	\$ 16.03	\$ 1,768.01	\$ 200.00	\$ 22,058.86	\$ 8.64	\$ 952.54	\$ -	\$ -	\$ 224.67	\$ 24,779.41
5.002	Balustrades	637.70	SF	0.33	210.44	IRON	\$ 64.12	\$ 21.16	\$ 13,493.43	\$ 125.00	\$ 79,712.50	\$ 6.33	\$ 4,038.77	\$ -	\$ -	\$ 152.49	\$ 97,244.69
5.003	Fare Gate Railing	30.80	LF	0.13	3.85	IRON	\$ 64.12	\$ 8.01	\$ 246.86	\$ 200.00	\$ 6,160.00	\$ -	\$ -	\$ -	\$ -	\$ 208.01	\$ 6,406.86
5.004	Bike Storage Facility - Excluded	1.00	LS	0.00	0.00	IRON	\$ 64.12	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>005 Metals Total</b>																	
<b>\$ 128,430.96</b>																	
<b>006 Wood and Plastics</b>																	
<b>006 Wood and Plastics Total</b>																	
<b>\$ -</b>																	
<b>007 Thermal and Moisture Protection</b>																	
7.001	Waterproofing	9302.79	SF	0.25	2325.70	B10M	\$ 45.13	\$ 11.28	\$ 104,960.86	\$ 10.00	\$ 93,027.90	\$ -	\$ -	\$ -	\$ -	\$ 21.28	\$ 197,988.76
<b>007 Thermal and Moisture Protection Total</b>																	
<b>\$ 197,988.76</b>																	
<b>008 Openings</b>																	
<b>Mezzanine Level:</b>																	
8.001	Elevator #1 Enclosure	1398.25	SF	0.07	93.68	GLAZ	\$ 51.64	\$ 3.46	\$ 4,838.11	\$ 200.00	\$ 279,649.78	\$ 1.06	\$ 1,475.93	\$ -	\$ -	\$ 204.52	\$ 285,963.82
8.002	Elevator #2 Enclosure	1398.25	SF	0.07	93.68	GLAZ	\$ 51.64	\$ 3.46	\$ 4,838.11	\$ 200.00	\$ 279,649.78	\$ 1.06	\$ 1,475.93	\$ -	\$ -	\$ 204.52	\$ 285,963.82
8.003	Interior Doors	10.00	EA	9.00	90.00	CARP	\$ 49.28	\$ 443.52	\$ 4,435.16	\$ 4,000.00	\$ 40,000.00	\$ 50.00	\$ 500.00	\$ -	\$ -	\$ 4,493.52	\$ 44,935.16
8.003	Entry Gates	3.00	EA	24.00	72.00	CARP	\$ 49.28	\$ 1,182.71	\$ 3,548.13	\$ 8,000.00	\$ 24,000.00	\$ 475.00	\$ 1,425.00	\$ -	\$ -	\$ 9,657.71	\$ 28,973.13
<b>Roof:</b>																	
8.004	Canopy Skylight	1773.71	SF	0.10	177.37	GLAZ	\$ 51.64	\$ 5.16	\$ 9,160.10	\$ 200.00	\$ 354,742.61	\$ 1.58	\$ 2,808.38	\$ -	\$ -	\$ 206.75	\$ 366,711.09
8.005	Mezzanine Roof Skylight	1915.00	SF	0.10	191.50	GLAZ	\$ 51.64	\$ 5.16	\$ 9,889.75	\$ 200.00	\$ 383,000.00	\$ 1.58	\$ 3,032.08	\$ -	\$ -	\$ 206.75	\$ 395,921.84
<b>008 Openings Total</b>																	
<b>\$ 1,408,468.86</b>																	
<b>009 Finishes</b>																	
9.001	New Mezzanine Finishes	8562.79	SF	0.25	2140.70	TILE	\$ 47.55	\$ 11.89	\$ 101,782.29	\$ 25.00	\$ 214,069.75	\$ -	\$ -	\$ -	\$ -	\$ 36.89	\$ 315,852.04
9.002	Elevator Machinery Room	150.00	SF	0.80	120.00	TILE	\$ 47.55	\$ 38.04	\$ 5,705.56	\$ 25.00	\$ 3,750.00	\$ -	\$ -	\$ -	\$ -	\$ 63.04	\$ 9,455.56



AECOM White Flint Station - New North Entrance  
 Gulf Tower Location: Montgomery County, MD  
 707 Grant Street Client: WMATA  
 Pittsburgh, PA 15219

Estimate by: SS 11/11/2019  
 Checked by: KS 11/11/2019

**13.00 Estimate Detail - Alternate 2**

Item #	Description	Quantity	UOM	MH/Unit	Tot. Hours	Crew	\$/MH	Labor	Labor Total	Material	Material Total	Equipment	Equipment Total	Other	Other Total	Unit Cost	Total Cost
9.003	Electric Room	75.00	SF	0.80	60.00	TILE	\$ 47.55	\$ 38.04	\$ 2,852.78	\$25.00	\$ 1,875.00	\$ -	\$ -	\$ -	\$ -	\$ 63.04	\$ 4,727.78
9.004	Staff & Public Restrooms	430.00	SF	0.80	344.00	TILE	\$ 47.55	\$ 38.04	\$ 16,355.93	\$25.00	\$ 10,750.00	\$ -	\$ -	\$ -	\$ -	\$ 63.04	\$ 27,105.93
9.005	Water Service Room	85.00	SF	0.80	68.00	TILE	\$ 47.55	\$ 38.04	\$ 3,233.15	\$25.00	\$ 2,125.00	\$ -	\$ -	\$ -	\$ -	\$ 63.04	\$ 5,358.15
	<b>009 Finishes Total</b>																\$ 362,499.47
	<b>010 Specialities</b>																\$ -
	<b>010 Specialities Total</b>																\$ -
	<b>011 Equipment</b>																\$ -
	<b>011 Equipment Total</b>																\$ -
	<b>012 Furnishings</b>																
12.001	Benches	10.00	EA	0.10	1.00	CARP	\$ 49.28	\$ 4.93	\$ 49.28	\$4,000.00	\$ 40,000.00	\$ -	\$ -	\$ -	\$ -	\$ 4,004.93	\$ 40,049.28
12.002	Waste and recycling containers	10.00	EA	0.10	1.00	CARP	\$ 49.28	\$ 4.93	\$ 49.28	\$1,500.00	\$ 15,000.00	\$ -	\$ -	\$ -	\$ -	\$ 1,504.93	\$ 15,049.28
	<b>012 Furnishings Total</b>																\$ 55,098.56
	<b>013 Special Construction</b>																\$ -
	<b>013 Special Construction Total</b>																\$ -
	<b>014 Conveying Systems</b>																
14.001	Elevators	2.00	EA	0.00	0.00	B10M	\$ 45.13	\$ -	\$ -	\$800,000.00	\$ 1,600,000.00	\$ -	\$ -	\$ -	\$ -	\$ 800,000.00	\$ 1,600,000.00
	<b>014 Conveying Systems Total</b>																\$ 1,600,000.00
	<b>021 Fire Suppression</b>																
21.001	FA Notification Device	9	EACH	1.20	10.80	ELEC	\$ 75.14	\$ 90.16	\$ 811.47	\$75.00	\$ 675.00	\$ -	\$ -	\$ -	\$ -	\$ 165.16	\$ 1,486.47
21.002	FA Initiation Device	6	EACH	1.20	7.20	ELEC	\$ 75.14	\$ 90.16	\$ 540.98	\$75.00	\$ 450.00	\$ -	\$ -	\$ -	\$ -	\$ 165.16	\$ 990.98
21.003	FA Equipment	1	ALLOW	29.96	29.96	ELEC	\$ 75.14	\$ 2,251.37	\$ 2,251.37	\$3,000.00	\$ 3,000.00	\$ -	\$ -	\$ -	\$ -	\$ 5,251.37	\$ 5,251.37
21.004	Fire Alarm Wiring	2000	LNFT	0.08	160.00	ELEC	\$ 75.14	\$ 6.01	\$ 12,022.33	\$1.00	\$ 2,000.00	\$ -	\$ -	\$ -	\$ -	\$ 7.01	\$ 14,022.33
21.005	FA Test & Check System	1	ALLOW	0.00	0.00	ELEC	\$ 75.14	\$ -	\$ -	\$1,500.00	\$ 1,500.00	\$ -	\$ -	\$ -	\$ -	\$ 1,500.00	\$ 1,500.00
21.006	FA Programing/ Engineering	1	ALLOW	0.00	0.00	ELEC	\$ 75.14	\$ -	\$ -	\$2,400.00	\$ 2,400.00	\$ -	\$ -	\$ -	\$ -	\$ 2,400.00	\$ 2,400.00
	<b>021 Fire Suppression Total</b>																\$ 25,651.14
	<b>022 Plumbing</b>																
22.001	Restrooms	3.00	EA	64.00	192.00	PLUM	\$ 71.88	\$ 4,600.58	\$ 13,801.75	\$8,000.00	\$ 24,000.00	\$ 1,000.00	\$ 3,000.00	\$ -	\$ -	\$ 13,600.58	\$ 40,801.75
22.002	Plumbing	9302.79	SF	0.35	3255.98	PLUM	\$ 71.88	\$ 25.16	\$ 234,053.02	\$4.50	\$ 41,862.56	\$ -	\$ -	\$ -	\$ -	\$ 29.66	\$ 275,915.57
	<b>022 Plumbing Total</b>																\$ 316,717.32
	<b>023 HVAC</b>																
23.001	HVAC	740	SF	0.00	0.00	ELEC	\$ 75.14	\$ -	\$ -	\$ -	\$ -	\$ 50.00	\$ 37,000.00	\$ -	\$ -	\$ 50.00	\$ 37,000.00
	<b>023 HVAC Total</b>																\$ 37,000.00
	<b>026 Electrical</b>																
26.001	Motor Control Center	1	EACH	35.00	35.00	ELEC	\$ 75.14	\$ 2,629.88	\$ 2,629.88	\$24,000.00	\$ 24,000.00	\$ -	\$ -	\$ -	\$ -	\$ 26,629.88	\$ 26,629.88
26.002	Primary Circuit Protection For MCC	1	EACH	12.00	12.00	ELEC	\$ 75.14	\$ 901.67	\$ 901.67	\$5,500.00	\$ 5,500.00	\$ -	\$ -	\$ -	\$ -	\$ 6,401.67	\$ 6,401.67
26.003	MCC Distribution Feeder Conduit & Wire	300	LNFT	0.82	246.00	ELEC	\$ 75.14	\$ 61.62	\$ 18,484.55	\$47.94	\$ 14,382.00	\$ -	\$ -	\$ -	\$ -	\$ 109.56	\$ 32,866.55
26.004	Power For Display Board	7	EACH	14.01	98.07	ELEC	\$ 75.14	\$ 1,052.74	\$ 7,369.20	\$210.00	\$ 1,470.00	\$ -	\$ -	\$ -	\$ -	\$ 1,262.74	\$ 8,839.20
26.005	Power To Elevator	2	EACH	34.93	69.87	ELEC	\$ 75.14	\$ 2,624.96	\$ 5,249.92	\$1,800.00	\$ 3,600.00	\$ -	\$ -	\$ -	\$ -	\$ 4,424.96	\$ 8,849.92
26.006	Power To Elevator Sump Pump	2	EACH	21.00	41.99	ELEC	\$ 75.14	\$ 1,577.73	\$ 3,155.47	\$450.00	\$ 900.00	\$ -	\$ -	\$ -	\$ -	\$ 2,027.73	\$ 4,055.47
26.007	Power To Base Board Heater	8	EACH	15.01	120.08	ELEC	\$ 75.14	\$ 1,127.80	\$ 9,022.38	\$220.00	\$ 1,760.00	\$ -	\$ -	\$ -	\$ -	\$ 1,347.80	\$ 10,782.38
26.008	Power To Ventilation Unit	6	EACH	20.00	120.00	ELEC	\$ 75.14	\$ 1,502.79	\$ 9,016.74	\$400.00	\$ 2,400.00	\$ -	\$ -	\$ -	\$ -	\$ 1,902.79	\$ 11,416.74
26.009	Emergency Power Tie Into Existing System ( Elevator, etc.)	1	ALLOW	60.00	60.00	ELEC	\$ 75.14	\$ 4,508.37	\$ 4,508.37	\$2,000.00	\$ 2,000.00	\$ -	\$ -	\$ -	\$ -	\$ 6,508.37	\$ 6,508.37
26.010	Canopy LED Light Fixture	42	EACH	1.20	50.40	ELEC	\$ 75.14	\$ 90.16	\$ 3,786.84	\$385.00	\$ 16,170.00	\$ -	\$ -	\$ -	\$ -	\$ 475.16	\$ 19,956.84
26.011	Platform Edge Light	84	EACH	1.50	126.01	ELEC	\$ 75.14	\$ 112.72	\$ 9,468.15	\$220.00	\$ 18,480.00	\$ -	\$ -	\$ -	\$ -	\$ 332.72	\$ 27,948.15
26.012	North Entrance Mezz Light	34	EACH	1.20	40.80	ELEC	\$ 75.14	\$ 90.16	\$ 3,065.54	\$285.00	\$ 9,690.00	\$ -	\$ -	\$ -	\$ -	\$ 375.16	\$ 12,755.54
26.013	Exterior Light	12	EACH	1.20	14.40	ELEC	\$ 75.14	\$ 90.16	\$ 1,081.96	\$185.00	\$ 2,220.00	\$ -	\$ -	\$ -	\$ -	\$ 275.16	\$ 3,301.96
26.014	Walkway Pole Light & Base	8	EACH	12.00	96.00	ELEC	\$ 75.14	\$ 901.67	\$ 7,213.40	\$1,800.00	\$ 14,400.00	\$ -	\$ -	\$ -	\$ -	\$ 2,701.67	\$ 21,613.40
26.015	Room Light LEDS	9	EACH	1.20	10.80	ELEC	\$ 75.14	\$ 90.16	\$ 811.47	\$220.00	\$ 1,980.00	\$ -	\$ -	\$ -	\$ -	\$ 310.16	\$ 2,791.47
26.016	Exit Sign	5	EACH	1.00	5.00	ELEC	\$ 75.14	\$ 75.14	\$ 375.70	\$225.00	\$ 1,125.00	\$ -	\$ -	\$ -	\$ -	\$ 300.14	\$ 1,500.70
26.017	Lighting Control	1	ALLOW	30.00	30.00	ELEC	\$ 75.14	\$ 2,254.19	\$ 2,254.19	\$1,000.00	\$ 1,000.00	\$ -	\$ -	\$ -	\$ -	\$ 3,254.19	\$ 3,254.19
26.018	Emergency Lighting- Tie Into Existing System	1	ALLOW	80.00	80.00	ELEC	\$ 75.14	\$ 6,011.16	\$ 6,011.16	\$2,500.00	\$ 2,500.00	\$ -	\$ -	\$ -	\$ -	\$ 8,511.16	\$ 8,511.16
26.019	Light Fixture Conduit & Wire	4800	LNFT	0.18	864.00	ELEC	\$ 75.14	\$ 13.53	\$ 64,920.56	\$1.20	\$ 5,760.00	\$ -	\$ -	\$ -	\$ -	\$ 14.73	\$ 70,680.56
26.020	Duplex Receptacle	19	EACH	0.80	15.20	ELEC	\$ 75.14	\$ 60.11	\$ 1,142.12	\$22.00	\$ 418.00	\$ -	\$ -	\$ -	\$ -	\$ 82.11	\$ 1,560.12
26.021	Duplex Receptacle GFI	6	EACH	1.00	6.00	ELEC	\$ 75.14	\$ 75.14	\$ 450.84	\$34.00	\$ 204.00	\$ -	\$ -	\$ -	\$ -	\$ 109.14	\$ 654.84
26.022	Quad Duplex Receptacle	4	EACH	1.20	4.80	ELEC	\$ 75.14	\$ 90.16	\$ 360.65	\$44.00	\$ 176.00	\$ -	\$ -	\$ -	\$ -	\$ 134.16	\$ 536.65
26.023	Duplex Receptacle GFI WP	6	EACH	1.20	7.20	ELEC	\$ 75.14	\$ 90.16	\$ 540.98	\$58.00	\$ 348.00	\$ -	\$ -	\$ -	\$ -	\$ 148.16	\$ 888.98
26.024	Receptacle Conduit & Wire	1400	LNFT	0.18	252.00	ELEC	\$ 75.14	\$ 13.53	\$ 18,935.16	\$1.20	\$ 1,680.00	\$ -	\$ -	\$ -	\$ -	\$ 14.73	\$ 20,615.16
26.025	Existing Etec Demo & Relocation	2	EA	132.00	264.00	ELEC	\$ 75.14	\$ 9,918.42	\$ 19,836.84	\$0.00	\$ -	\$ 1,200.00	\$ 2,400.00	\$ -	\$ -	\$ 11,118.42	\$ 22,236.84
26.026	Commissioning	1	LS	80.00	80.00	ELEC	\$ 75.14	\$ 6,011.16	\$ 6,011.16	\$0.00	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 6,011.16	\$ 6,011.16
26.027	New Signage	1	LS	0.00	0.00	ELEC	\$ 75.14	\$ -	\$ -	\$0.00	\$ -	\$ -	\$ -	\$ 262,500.00	\$ 262,500.00	\$ 262,500.00	\$ 262,500.00
	<b>026 Electrical Total</b>																\$ 603,667.91
	<b>027 Communications</b>																
27.001	Data/Voice Outlet	6	EACH	2.50	15.00	ELEC	\$ 75.14	\$ 187.85	\$ 1,127.09	\$45.00	\$ 270.00	\$ -	\$ -	\$ -	\$ -	\$ 232.85	\$ 1,397.09



AECOM White Flint Station - New North Entrance  
 Gulf Tower Location: Montgomery County, MD  
 707 Grant Street Client: WMATA  
 Pittsburgh, PA 15219

Estimate by: SS 11/11/2019  
 Checked by: KS 11/11/2019

**13.00 Estimate Detail - Alternate 2**

Item #	Description	Quantity	UOM	MH/Unit	Tot. Hours	Crew	\$/MH	Labor	Labor Total	Material	Material Total	Equipment	Equipment Total	Other	Other Total	Unit Cost	Total Cost
27.002	Data/Voice Outlet Conduit & Wire	900	LNFT	0.18	162.00	ELEC	\$ 75.14	\$ 13.53	\$ 12,172.61	\$1.20	\$ 1,080.00	\$ -	\$ -	\$ -	\$ -	\$ 14.73	\$ 13,252.61
27.003	Work At IT Existing Rack	1	ALLOW	8.00	8.00	ELEC	\$ 75.14	\$ 601.12	\$ 601.12	\$1,000.00	\$ 1,000.00	\$ -	\$ -	\$ -	\$ -	\$ 1,601.12	\$ 1,601.12
<b>027 Communications Total</b>																	
<b>\$ 16,250.81</b>																	
<b>028 Security Systems</b>																	
28.001	Speaker	29	EACH	2.00	58.00	ELEC	\$ 75.14	\$ 150.28	\$ 4,358.09	\$145.00	\$ 4,205.00	\$ -	\$ -	\$ -	\$ -	\$ 295.28	\$ 8,563.09
28.002	Sound System Front End Equipment	1	ALLOW	24.02	24.02	ELEC	\$ 75.14	\$ 1,805.15	\$ 1,805.15	\$4,500.00	\$ 4,500.00	\$ -	\$ -	\$ -	\$ -	\$ 6,305.15	\$ 6,305.15
28.003	Speaker Conduit & Wire	1600	LNFT	0.18	288.00	ELEC	\$ 75.14	\$ 13.53	\$ 21,640.19	\$1.00	\$ 1,600.00	\$ -	\$ -	\$ -	\$ -	\$ 14.53	\$ 23,240.19
28.004	Camera	17	EACH	4.00	68.00	ELEC	\$ 75.14	\$ 300.56	\$ 5,109.49	\$1,000.00	\$ 17,000.00	\$ -	\$ -	\$ -	\$ -	\$ 1,300.56	\$ 22,109.49
28.005	Camera Conduit & Wire	2600	LNFT	0.18	468.00	ELEC	\$ 75.14	\$ 13.53	\$ 35,165.30	\$1.20	\$ 3,120.00	\$ -	\$ -	\$ -	\$ -	\$ 14.73	\$ 38,285.30
28.006	Video Front End Equipment	1	ALLOW	24.02	24.02	ELEC	\$ 75.14	\$ 1,805.15	\$ 1,805.15	\$6,000.00	\$ 6,000.00	\$ -	\$ -	\$ -	\$ -	\$ 7,805.15	\$ 7,805.15
<b>028 Security Systems Total</b>																	
<b>\$ 106,308.38</b>																	
<b>031 Earthwork</b>																	
31.001	Compacted Backfill	64.20	CUYD	0.10	6.42	EOM	\$ 47.80	\$ 4.78	\$ 306.90	\$26.00	\$ 1,669.20	\$ 25.23	\$ 1,619.82	\$ -	\$ -	\$ 56.01	\$ 3,595.92
31.002	Excavation	344.55	CUYD	0.10	34.45	B10M	\$ 45.13	\$ 4.51	\$ 1,554.98	\$0.00	\$ -	\$ 10.00	\$ 3,445.48	\$ -	\$ -	\$ 14.51	\$ 5,000.45
<b>031 Earthwork Total</b>																	
<b>\$ 8,596.37</b>																	
<b>032 Exterior Improvements</b>																	
32.001	Landscaping	1.00	ALLOW	120.00	120.00	LABOR	\$ 39.78	\$ 4,774.17	\$ 4,774.17	\$100,000.00	\$ 100,000.00	\$ 4,300.00	\$ 4,300.00	\$ -	\$ -	\$ 109,074.17	\$ 109,074.17
<b>032 Exterior Improvements Total</b>																	
<b>\$ 109,074.17</b>																	
<b>033 Utilities</b>																	
33.001	Utility Relocation	1.00	ALLOW	0.00	0.00	B10M	\$ 45.13	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 400,000.00	\$ 400,000.00	\$ 400,000.00	\$ 400,000.00
33.002	Fire Protection Piping	9302.79	SF	0.10	930.28	B10M	\$ 45.13	\$ 4.51	\$ 41,984.35	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 4.51	\$ 41,984.35
<b>033 Utilities Total</b>																	
<b>\$ 441,984.35</b>																	
<b>034 Transportation</b>																	
34.001	Ticket Vending Machines (TVM)	8.00	EA	0.00	0.00	B10M	\$ 45.13	\$ -	\$ -	\$160,000.00	\$ 1,280,000.00	\$ -	\$ -	\$ -	\$ -	\$ 160,000.00	\$ 1,280,000.00
34.002	Fare Gates	5.00	EA	0.00	0.00	B10M	\$ 45.13	\$ -	\$ -	\$100,000.00	\$ 500,000.00	\$ -	\$ -	\$ -	\$ -	\$ 100,000.00	\$ 500,000.00
34.003	Station Manager Kiosk	1.00	EA	96.00	96.00	B10M	\$ 45.13	\$ 4,332.57	\$ 4,332.57	\$80,000.00	\$ 80,000.00	\$ 1,200.00	\$ 1,200.00	\$ -	\$ -	\$ 85,532.57	\$ 85,532.57
<b>034 Transportation Total</b>																	
<b>\$ 1,865,532.57</b>																	
<b>\$ 9,019,381.64</b>																	



AECOM  
 Gulf Tower  
 707 Grant Street  
 Pittsburgh, PA 15219

Project: White Flint Station - New North Entrance  
 Location: Montgomery County, MD  
 Client: WMATA

11/11/2019

Schematic Design

Estimate Summary - Alternate 3

Division	Description	% of Costs	Total
1	General Conditions	0.00%	\$ -
2	Existing Conditions	2.85%	\$ 273,074
3	Concrete	19.60%	\$ 1,876,776
4	Masonry	0.00%	\$ -
5	Metals	1.31%	\$ 125,664
6	Wood, Lumber, and Composites	0.00%	\$ -
7	Thermal and Moisture Protection	2.19%	\$ 209,534
8	Openings	15.72%	\$ 1,505,467
9	Finishes	3.90%	\$ 373,518
10	Specialties	0.00%	\$ -
11	Equipment	0.00%	\$ -
12	Furnishings	0.72%	\$ 69,118
13	Special Construction	0.00%	\$ -
14	Conveying Systems	16.71%	\$ 1,600,000
21	Fire Suppression	0.27%	\$ 25,651
22	Plumbing	3.40%	\$ 325,577
23	Heating, Ventilating, and Air Conditioning	0.39%	\$ 37,000
26	Electrical	6.31%	\$ 603,668
27	Communications	0.17%	\$ 16,251
28	Electronic Safety and Security	1.11%	\$ 106,308
31	Earthwork	0.09%	\$ 8,596
32	Exterior Improvements	1.14%	\$ 109,074
33	Utilities	4.63%	\$ 443,332
34	Transportation	19.49%	\$ 1,865,533
<b>Subtotal</b>			<b>\$ 9,574,142</b>
General Conditions		15.00%	\$ 1,436,121
Security Allowance		3.00%	\$ 287,224
Phasing Requirements		Not Required	0.00% \$ -
<b>Subtotal</b>			<b>\$ 11,297,488</b>
Mid Project Escalation		Included in Summary Comparison	0.00% \$ -
<b>Subtotal</b>			<b>\$ 11,297,488</b>
General Contractor Overhead		10.00%	\$ 1,129,749
General Contractor Profit		10.00%	\$ 1,129,749
<b>Subtotal</b>			<b>\$ 13,556,985</b>
Bonds and Insurance		2.00%	\$ 271,140
<b>Subtotal</b>			<b>\$ 13,828,125</b>
Allocated Contingency		30.00%	\$ 4,148,437
Unallocated Contingency		Included in Summary Comparison	0.00% \$ -
<b>Total Construction Costs</b>			<b>\$ 17,976,562</b>
Professional Services		Included in Summary Comparison	0.00% \$ -
<b>Total Cost</b>			<b>\$ 17,976,562</b>



AECOM White Flint Station - New North Entrance  
 Gulf Tower Location: Montgomery County, MD  
 707 Grant Street Client: WMATA  
 Pittsburgh, PA 15219

Estimate by: SS 11/11/2019  
 Checked by: KS 11/11/2019

13.00 Estimate Detail - Alternate 3

Item #	Description	Quantity	UOM	MH/Unit	Tot. Hours	Crew	\$/MH	Labor	Labor Total	Material	Material Total	Equipment	Equipment Total	Other	Other Total	Unit Cost	Subtotal	Sub Markups	Total Cost		
<b>001 General Conditions</b>																					
<b>001 General Conditions Total</b>																					
																			\$	-	
<b>002 Existing Conditions</b>																					
2.001	Elevator Pits Demo	36.94	CUYD	4.80	177.33	B10M	\$ 45.13	\$ 216.63	\$ 8,003.22	\$ 0.00	\$ -	\$ 134.29	\$ 4,961.11	\$ -	\$ -	\$ -	\$ 350.91	\$ 12,964.33	0.00%	\$ 12,964.33	
2.002	Existing Slab Demo	6.17	CUYD	4.00	24.67	CONC001	\$ 48.34	\$ 193.37	\$ 1,192.47	\$ 0.00	\$ -	\$ 131.67	\$ 811.94	\$ -	\$ -	\$ -	\$ 325.04	\$ 2,004.42	0.00%	\$ 2,004.42	
2.003	Existing Pylon Type A-1 Demo	3.00	EA	4.00	12.00	CARP	\$ 49.28	\$ 197.12	\$ 591.35	\$ 0.00	\$ -	\$ 1,300.00	\$ 3,900.00	\$ -	\$ -	\$ -	\$ 1,497.12	\$ 4,491.35	0.00%	\$ 4,491.35	
2.004	Existing Sheltered Bench Demo	2.00	EA	8.00	16.00	CARP	\$ 49.28	\$ 394.24	\$ 788.47	\$ 0.00	\$ -	\$ 1,300.00	\$ 2,600.00	\$ -	\$ -	\$ -	\$ 1,694.24	\$ 3,388.47	0.00%	\$ 3,388.47	
2.005	Trackside Safety Fence	1000.00	LF	0.50	500.00	CARP	\$ 49.28	\$ 24.64	\$ 24,639.77	\$ 35.00	\$ 35,000.00	\$ 0.65	\$ 650.00	\$ -	\$ -	\$ -	\$ 60.29	\$ 60,289.77	0.00%	\$ 60,289.77	
2.006	Platform Slab Opening - cut & place back once piles, footing and column complete	210.00	SF	0.50	105.00	B10M	\$ 81.20	\$ 40.60	\$ 8,526.26	\$ 30.00	\$ 6,300.00	\$ 33.40	\$ 7,014.00	\$ -	\$ -	\$ -	\$ 104.00	\$ 21,840.26	0.00%	\$ 21,840.26	
2.007	Core through Invert Slab	70.00	SF	1.20	84.00	B10M	\$ 81.20	\$ 97.44	\$ 6,821.01	\$ 0.00	\$ -	\$ 394.00	\$ 27,580.00	\$ -	\$ -	\$ -	\$ 491.44	\$ 34,401.01	0.00%	\$ 34,401.01	
2.008	Temporary Shoring btw platform and invert slab	576.00	SF	0.33	190.08	B10M	\$ 81.20	\$ 26.80	\$ 15,434.97	\$ 15.00	\$ 8,640.00	\$ 16.70	\$ 9,619.20	\$ -	\$ -	\$ -	\$ 58.50	\$ 33,694.17	0.00%	\$ 33,694.17	
2.009	Monitoring of Surrounding Structure	1.00	ALLOW	0.00	0.00	B10M	\$ 81.20	\$ -	\$ -	\$ 0.00	\$ -	\$ -	\$ -	\$ 100,000.00	\$ 100,000.00	\$ -	\$ 100,000.00	\$ 100,000.00	0.00%	\$ 100,000.00	
<b>002 Existing Conditions Total</b>																			\$	<b>273,073.79</b>	
<b>003 Concrete</b>																					
<b>Mezzanine Level:</b>																					
3.001	Floor - Elevator Mezz Area, 8" depth	76.53	CUYD	5.00	382.67	CONC001	\$ 48.34	\$ 241.72	\$ 18,499.42	\$ 290.12	\$ 22,204.16	\$ 60.00	\$ 4,592.00	\$ -	\$ -	\$ -	\$ 591.84	\$ 45,295.58	0.00%	\$ 45,295.58	
3.002	Concrete Floor Beams	54.67	CUYD	6.50	355.33	IRON	\$ 76.94	\$ 500.13	\$ 27,340.67	\$ 290.00	\$ 15,853.33	\$ 350.00	\$ 19,133.33	\$ -	\$ -	\$ -	\$ 1,140.13	\$ 62,327.33	0.00%	\$ 62,327.33	
3.003	Double-Wide 10' Stairs	367.65	SF	0.50	183.82	CONC001	\$ 48.34	\$ 24.17	\$ 8,886.67	\$ 35.00	\$ 12,867.67	\$ 4.29	\$ 1,575.63	\$ -	\$ -	\$ -	\$ 63.46	\$ 23,329.97	0.00%	\$ 23,329.97	
3.004	Floor, 12" Slab on grade w/ 4" finish	229.75	CUYD	5.00	1148.74	CONC001	\$ 48.34	\$ 241.72	\$ 55,533.98	\$ 290.12	\$ 66,655.36	\$ 20.00	\$ 4,594.96	\$ -	\$ -	\$ -	\$ 551.84	\$ 126,784.30	0.00%	\$ 126,784.30	
3.005	Concrete Grade Beams	27.62	CUYD	15.00	414.33	CONC001	\$ 48.34	\$ 725.15	\$ 20,030.30	\$ 290.00	\$ 8,010.44	\$ 205.56	\$ 5,677.90	\$ -	\$ -	\$ -	\$ 1,220.71	\$ 33,718.64	0.00%	\$ 33,718.64	
3.006	Exterior Walls	38.44	CUYD	10.00	384.44	CONC001	\$ 48.34	\$ 483.43	\$ 18,585.36	\$ 290.12	\$ 11,153.66	\$ 200.00	\$ 7,688.89	\$ -	\$ -	\$ -	\$ 973.56	\$ 37,427.91	0.00%	\$ 37,427.91	
3.007	8" Interior Walls	77.36	CUYD	10.00	773.58	CONC001	\$ 48.34	\$ 483.43	\$ 37,397.53	\$ 290.12	\$ 22,443.43	\$ 200.00	\$ 15,471.60	\$ -	\$ -	\$ -	\$ 973.56	\$ 75,312.56	0.00%	\$ 75,312.56	
3.008	6" Interior Walls	34.91	CUYD	10.00	349.07	CONC001	\$ 48.34	\$ 483.43	\$ 16,875.44	\$ 290.12	\$ 10,127.48	\$ 200.00	\$ 6,981.48	\$ -	\$ -	\$ -	\$ 973.56	\$ 33,984.40	0.00%	\$ 33,984.40	
3.009	Sidewalk	2600.00	SF	0.05	130.00	CONC001	\$ 48.34	\$ 2.42	\$ 6,284.65	\$ 10.00	\$ 26,000.00	\$ 1.09	\$ 2,846.72	\$ -	\$ -	\$ -	\$ 13.51	\$ 35,131.36	0.00%	\$ 35,131.36	
3.010	Concrete Columns, 2.5' x 2.5'	39.81	CUYD	20.00	796.30	CONC001	\$ 48.34	\$ 966.87	\$ 38,495.70	\$ 290.12	\$ 11,551.24	\$ 200.00	\$ 7,962.96	\$ -	\$ -	\$ -	\$ 1,456.99	\$ 58,009.90	0.00%	\$ 58,009.90	
3.011	New Canopy Columns	9.00	CUYD	24.00	216.00	CONC001	\$ 48.34	\$ 1,160.24	\$ 10,442.18	\$ 290.00	\$ 2,610.00	\$ 500.00	\$ 4,500.00	\$ -	\$ -	\$ -	\$ 1,950.24	\$ 17,552.18	0.00%	\$ 17,552.18	
<b>Platform Level:</b>																					
3.012	Elevator Pits	36.94	CUYD	6.00	221.67	CONC001	\$ 48.34	\$ 290.06	\$ 10,716.13	\$ 290.00	\$ 10,713.89	\$ 50.00	\$ 1,847.22	\$ -	\$ -	\$ -	\$ 630.06	\$ 23,277.24	0.00%	\$ 23,277.24	
3.013	Drilled Shafts, 48"	168.00	VLF	5.00	840.00	PILE	\$ 64.54	\$ 322.71	\$ 54,214.69	\$ 158.24	\$ 26,584.86	\$ 166.67	\$ 28,000.00	\$ -	\$ -	\$ -	\$ 647.62	\$ 108,799.55	0.00%	\$ 108,799.55	
3.014	Concrete Columns, 1.5' x 1.5'	21.00	CUYD	18.00	378.00	CONC001	\$ 48.34	\$ 870.18	\$ 18,273.82	\$ 290.12	\$ 6,092.61	\$ 500.00	\$ 10,500.00	\$ -	\$ -	\$ -	\$ 1,660.31	\$ 34,866.42	0.00%	\$ 34,866.42	
3.015	Column Footing Grade Beam, 3'x3'x5' long	10.00	CUYD	20.00	200.00	CONC001	\$ 48.34	\$ 966.87	\$ 9,668.69	\$ 290.00	\$ 2,900.00	\$ 740.00	\$ 7,400.00	\$ -	\$ -	\$ -	\$ 1,996.87	\$ 19,968.69	0.00%	\$ 19,968.69	
3.016	Micropiles 9" dia.	1440.00	VLF	0.80	1152.00	PILE	\$ 64.54	\$ 51.63	\$ 74,351.58	\$ 90.00	\$ 129,600.00	\$ 47.90	\$ 68,980.65	\$ -	\$ -	\$ -	\$ 189.54	\$ 272,932.22	0.00%	\$ 272,932.22	
<b>Roof:</b>																					
3.017	Canopy Platform Incline	44.61	CUYD	6.50	289.98	IRON	\$ 64.12	\$ 416.78	\$ 18,593.51	\$ 290.00	\$ 12,937.62	\$ 350.00	\$ 15,614.36	\$ -	\$ -	\$ -	\$ 1,056.78	\$ 47,145.49	0.00%	\$ 47,145.49	
3.018	Canopy Longitudinal Beams - Incline	32.48	CUYD	6.00	194.85	IRON	\$ 64.12	\$ 384.72	\$ 12,493.83	\$ 290.00	\$ 9,417.82	\$ 310.00	\$ 10,067.33	\$ -	\$ -	\$ -	\$ 984.72	\$ 31,978.98	0.00%	\$ 31,978.98	
3.019	Canopy Primary Beams	36.00	CUYD	6.00	216.00	IRON	\$ 76.94	\$ 461.66	\$ 16,619.84	\$ 290.00	\$ 10,440.00	\$ 350.00	\$ 12,600.00	\$ -	\$ -	\$ -	\$ 1,101.66	\$ 39,659.84	0.00%	\$ 39,659.84	
3.020	Canopy Secondary Beams - Incline	19.83	CUYD	5.50	109.08	IRON	\$ 76.94	\$ 423.19	\$ 8,393.28	\$ 290.00	\$ 5,751.67	\$ 350.00	\$ 6,941.67	\$ -	\$ -	\$ -	\$ 1,063.19	\$ 21,086.61	0.00%	\$ 21,086.61	
3.021	Mezzanine Roof Framing	63.74	CUYD	6.00	382.44	IRON	\$ 64.12	\$ 384.72	\$ 24,522.25	\$ 290.00	\$ 18,484.81	\$ 150.00	\$ 824.72	\$ -	\$ -	\$ -	\$ 52,568.17	\$ 52,568.17	0.00%	\$ 52,568.17	
3.022	Mezzanine Roof Slab, 6"	72.59	CUYD	6.00	435.56	CONC001	\$ 48.34	\$ 290.06	\$ 21,056.25	\$ 290.00	\$ 21,051.85	\$ 125.00	\$ 9,074.07	\$ -	\$ -	\$ -	\$ 705.06	\$ 51,182.18	0.00%	\$ 51,182.18	
3.023	Canopy Platform Extension	146.91	CUYD	7.00	1028.40	IRON	\$ 64.12	\$ 448.84	\$ 65,940.45	\$ 290.00	\$ 42,604.94	\$ 180.00	\$ 26,444.44	\$ -	\$ -	\$ -	\$ 918.84	\$ 134,989.83	0.00%	\$ 134,989.83	
3.024	Canopy Longitudinal Beams	106.94	CUYD	8.00	855.56	IRON	\$ 64.12	\$ 512.96	\$ 54,858.02	\$ 290.00	\$ 31,013.89	\$ 190.00	\$ 20,319.44	\$ -	\$ -	\$ -	\$ 992.96	\$ 106,191.35	0.00%	\$ 106,191.35	
3.025	Canopy Secondary Beams	72.72	CUYD	6.00	436.33	IRON	\$ 76.94	\$ 461.66	\$ 33,573.11	\$ 290.00	\$ 21,089.44	\$ 280.00	\$ 20,362.22	\$ -	\$ -	\$ -	\$ 1,031.66	\$ 75,024.77	0.00%	\$ 75,024.77	
3.026	Mezzanine Entrance Roof Framing	258.15	CUYD	6.50	1677.96	IRON	\$ 64.12	\$ 416.78	\$ 107,590.58	\$ 290.00	\$ 74,862.96	\$ 115.00	\$ 29,687.04	\$ -	\$ -	\$ -	\$ 821.78	\$ 212,140.58	0.00%	\$ 212,140.58	
3.027	Mezzanine Entrance Roof Slab, 6"	136.07	CUYD	8.00	1088.59	CONC001	\$ 48.34	\$ 386.75	\$ 52,626.30	\$ 290.00	\$ 39,461.48	\$ 29.41	\$ 4,002.18	\$ -	\$ -	\$ -	\$ 706.16	\$ 96,089.96	0.00%	\$ 96,089.96	
<b>003 Concrete Total</b>																			\$	<b>1,876,776.04</b>	
<b>004 Masonry</b>																					
<b>004 Masonry Total</b>																				\$	-
<b>005 Metals</b>																					
<b>Mezzanine Level:</b>																					
5.001	Stairs Railing	110.29	LF	0.25	27.57	IRON	\$ 64.12	\$ 16.03	\$ 1,768.01	\$ 200.00	\$ 22,058.86	\$ 8.64	\$ 952.54	\$ -	\$ -	\$ -	\$ 224.67	\$ 24,779.41	0.00%	\$ 24,779.41	
5.002	Balustrades	637.70	SF	0.33	210.44	IRON	\$ 64.12	\$ 21.16	\$ 13,493.43	\$ 125.00	\$ 79,712.50	\$ 6.33	\$ 4,038.77	\$ -	\$ -	\$ -	\$ 152.49	\$ 97,244.69	0.00%	\$ 97,244.69	
5.003	Fare Gate Railing	17.50	LF	0.13	2.19	IRON	\$ 64.12	\$ 8.01	\$ 140.26	\$ 200.00	\$ 3,500.00	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 208.01	\$ 3,640.26	0.00%	\$ 3,640.26	
5.004	Bike Storage Facility - Excluded	1.00	LS	0.00	0.00	IRON	\$ 64.12	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00%	\$ -	
<b>005 Metals Total</b>																			\$	<b>125,664.36</b>	
<b>006 Wood and Plastics</b>																					
<b>006 Wood and Plastics Total</b>																				\$	-
<b>007 Thermal and Moisture Protection</b>																					
7.001	Waterproofing	9601.50	SF	0.25	2400.38	B10M	\$ 45.13	\$ 11.28	\$ 108,331.13	\$ 10.00	\$ 96,015.00	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 21.28	\$ 204,346.13	0.00%	\$ 204,346.13	
7.002	Waterproofing Seal - micropile and invert slab	70.00	SF	0.68	47.60	B10M	\$ 45.13	\$ 30.69	\$ 2,148.23	\$ 30.00	\$ 2,100.00	\$ 13.43	\$ 940.00	\$ -	\$ -	\$ -	\$ 74.12	\$ 5,188.23	0.00%	\$ 5,188.23	
<b>007 Thermal and Moisture Protection Total</b>																			\$	<b>209,534.36</b>	
<b>008 Openings</b>																					
<b>Mezzanine Level:</b>																					
8.001	Elevator #1 Enclosure	1398.25	SF	0.07	93.68	GLAZ	\$ 51.64	\$ 3.46	\$ 4,838.11	\$ 200.00	\$ 279,649.78	\$ 1.06	\$ 1,475.93	\$ -	\$ -	\$ -	\$ 204.52	\$ 285,963.82	0.00%	\$ 285,963.82	
8.001	Elevator #2 Enclosure	1398.25	SF	0.07	93.68	GLAZ	\$ 51.64	\$ 3.46	\$ 4,838.11	\$ 200.00	\$ 279,649.78	\$ 1.06	\$ 1,475.93	\$ -	\$ -	\$ -	\$ 204.52	\$ 285,963.82	0.00%	\$ 285,963.82	
8.003	Interior Doors	10.00	EA	9.00	90.00	CARP	\$ 49.28	\$ 443.52	\$ 4,435.16	\$ 4,000.00	\$ 40,000.00	\$ 50.00	\$ 500.00	\$ -	\$ -	\$ -	\$ 4,493.52	\$ 44,935.16	0.00%		







AECOM White Flint Station - New North Entrance  
 Gulf Tower Location: Montgomery County, MD  
 707 Grant Street Client: WMATA  
 Pittsburgh, PA 15219

Estimate by: SS 11/11/2019  
 Checked by: KS 11/11/2019

**13.00 Estimate Detail - Alternate 3**

Item #	Description	Quantity	UOM	MH/Unit	Tot. Hours	Crew	\$/MH	Labor	Labor Total	Material	Material Total	Equipment	Equipment Total	Other	Other Total	Unit Cost	Subtotal	Sub Markups	Total Cost	
<b>028 Security Systems</b>																				
28.001	Speaker	29	EACH	2.00	58.00	ELEC	\$ 75.14	\$ 150.28	\$ 4,358.09	\$145.00	\$ 4,205.00	\$ -	\$ -	\$ -	\$ -	\$ -	295.28	\$ 8,563.09	0.00%	\$ 8,563.09
28.002	Sound System Front End Equipment	1	ALLOW	24.02	24.02	ELEC	\$ 75.14	\$ 1,805.15	\$ 1,805.15	\$4,500.00	\$ 4,500.00	\$ -	\$ -	\$ -	\$ -	\$ -	6,305.15	\$ 6,305.15	0.00%	\$ 6,305.15
28.003	Speaker Conduit & Wire	1600	LNFT	0.18	288.00	ELEC	\$ 75.14	\$ 13.53	\$ 21,640.19	\$1.00	\$ 1,600.00	\$ -	\$ -	\$ -	\$ -	\$ -	14.53	\$ 23,240.19	0.00%	\$ 23,240.19
28.004	Camera	17	EACH	4.00	68.00	ELEC	\$ 75.14	\$ 300.56	\$ 5,109.49	\$1,000.00	\$ 17,000.00	\$ -	\$ -	\$ -	\$ -	\$ -	1,300.56	\$ 22,109.49	0.00%	\$ 22,109.49
28.005	Camera Conduit & Wire	2600	LNFT	0.18	468.00	ELEC	\$ 75.14	\$ 13.53	\$ 35,165.30	\$1.20	\$ 3,120.00	\$ -	\$ -	\$ -	\$ -	\$ -	14.73	\$ 38,285.30	0.00%	\$ 38,285.30
28.006	Video Front End Equipment	1	ALLOW	24.02	24.02	ELEC	\$ 75.14	\$ 1,805.15	\$ 1,805.15	\$6,000.00	\$ 6,000.00	\$ -	\$ -	\$ -	\$ -	\$ -	7,805.15	\$ 7,805.15	0.00%	\$ 7,805.15
<b>028 Security Systems Total</b>																			<b>\$</b>	<b>106,308.38</b>
<b>031 Earthwork</b>																				
31.001	Compacted Backfill	64.20	CUYD	0.10	6.42	EOM	\$ 47.80	\$ 4.78	\$ 306.90	\$26.00	\$ 1,669.20	\$ 25.23	\$ 1,619.82	\$ -	\$ -	\$ -	56.01	\$ 3,595.92	0.00%	\$ 3,595.92
31.002	Excavation	344.55	CUYD	0.10	34.45	B10M	\$ 45.13	\$ 4.51	\$ 1,554.98	\$0.00	\$ -	\$ 10.00	\$ 3,445.48	\$ -	\$ -	\$ -	14.51	\$ 5,000.45	0.00%	\$ 5,000.45
31.003	Pressure Grouting - drilling, grout and pressure pumping	1440.00	VLF	0.50	720.00	B10M	\$ 54.16	\$ 27.08	\$ 38,993.11	\$50.00	\$ 72,000.00	\$ 35.00	\$ 50,400.00	\$ -	\$ -	\$ -	112.08	\$ 161,393.11	0.00%	\$ 161,393.11
<b>031 Earthwork Total</b>																			<b>\$</b>	<b>8,596.37</b>
<b>032 Exterior Improvements</b>																				
32.001	Landscaping	1.00	ALLOW	120.00	120.00	LABOR	\$ 39.78	\$ 4,774.17	\$ 4,774.17	\$100,000.00	\$ 100,000.00	\$ 4,300.00	\$ 4,300.00	\$ -	\$ -	\$ -	109,074.17	\$ 109,074.17	0.00%	\$ 109,074.17
<b>032 Exterior Improvements Total</b>																			<b>\$</b>	<b>109,074.17</b>
<b>033 Utilities</b>																				
33.001	Utility Relocation	1.00	ALLOW	0.00	0.00	B10M	\$ 45.13	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 400,000.00	\$ 400,000.00	\$ 400,000.00	\$ 400,000.00	0.00%	\$ 400,000.00	
33.002	Fire Protection Piping	9601.50	SF	0.10	960.15	B10M	\$ 45.13	\$ 4.51	\$ 43,332.45	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	4.51	\$ 43,332.45	0.00%	\$ 43,332.45
<b>033 Utilities Total</b>																			<b>\$</b>	<b>443,332.45</b>
<b>034 Transportation</b>																				
34.001	Ticket Vending Machines (TVM)	8.00	EA	0.00	0.00	B10M	\$ 45.13	\$ -	\$ -	\$160,000.00	\$ 1,280,000.00	\$ -	\$ -	\$ -	\$ -	\$ -	160,000.00	\$ 1,280,000.00	0.00%	\$ 1,280,000.00
34.002	Station Manager Kiosk	1.00	EA	96.00	96.00	B10M	\$ 45.13	\$ 4,332.57	\$ 4,332.57	\$80,000.00	\$ 80,000.00	\$ 1,200.00	\$ 1,200.00	\$ -	\$ -	\$ -	85,532.57	\$ 85,532.57	0.00%	\$ 85,532.57
34.003	Fare Gates	5.00	EA	0.00	0.00	B10M	\$ 45.13	\$ -	\$ -	\$100,000.00	\$ 500,000.00	\$ -	\$ -	\$ -	\$ -	\$ -	100,000.00	\$ 500,000.00	0.00%	\$ 500,000.00
<b>034 Transportation Total</b>																			<b>\$</b>	<b>1,865,532.57</b>
																			<b>\$</b>	<b>9,574,142.08</b>



## Appendix C:

### Technical Memoranda

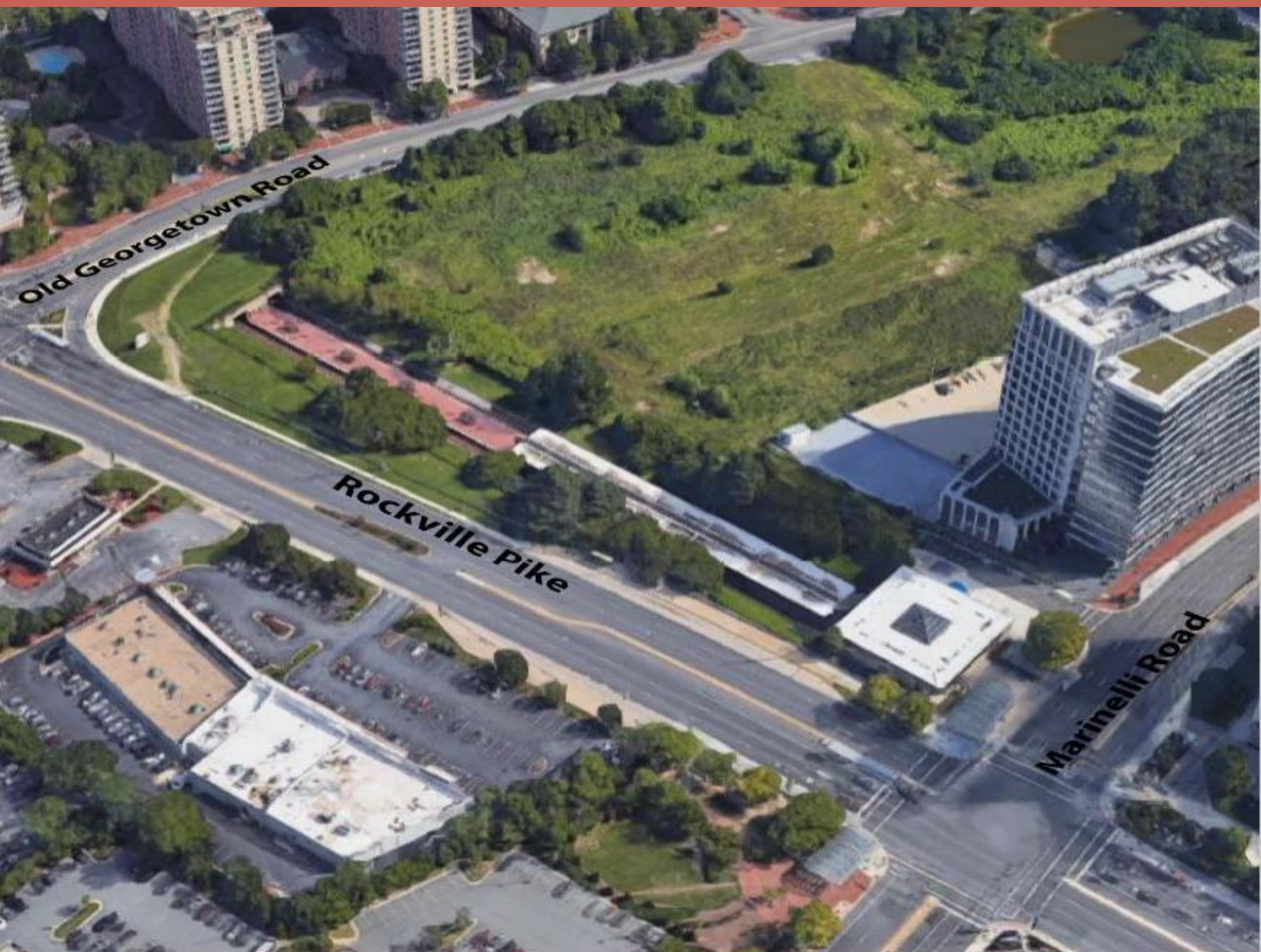
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  - Egress Calculations..... C-25
  - Egress Diagrams..... C-45
- Demand Assessment ..... C-46

# White Flint Metrorail Station North Entrance Study

Egress Analysis

Draft Report

Montgomery County, Maryland  
April, 2019



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# White Flint Metrorail Station North Entrance Study

## Egress Analysis

April 2019



### **Lead Agency**

Washington Metropolitan Area Transit Authority  
Office of Planning  
600 5th Street NW  
Washington, DC 20001

Shyam Kannan, Director of Planning  
Robin McElhenny, Program Manager of Station Planning  
Sara Benson, Project Manager

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*\*Appendix provided as a separate volume.*



## 1.0 INTRODUCTION

This report addresses the effect of the proposed alterations and additions to the WMATA White Flint Metrorail Station (“White Flint Station”) on the means of egress from the public areas of the station. The station is located within the State of Maryland and serves the Red Line.

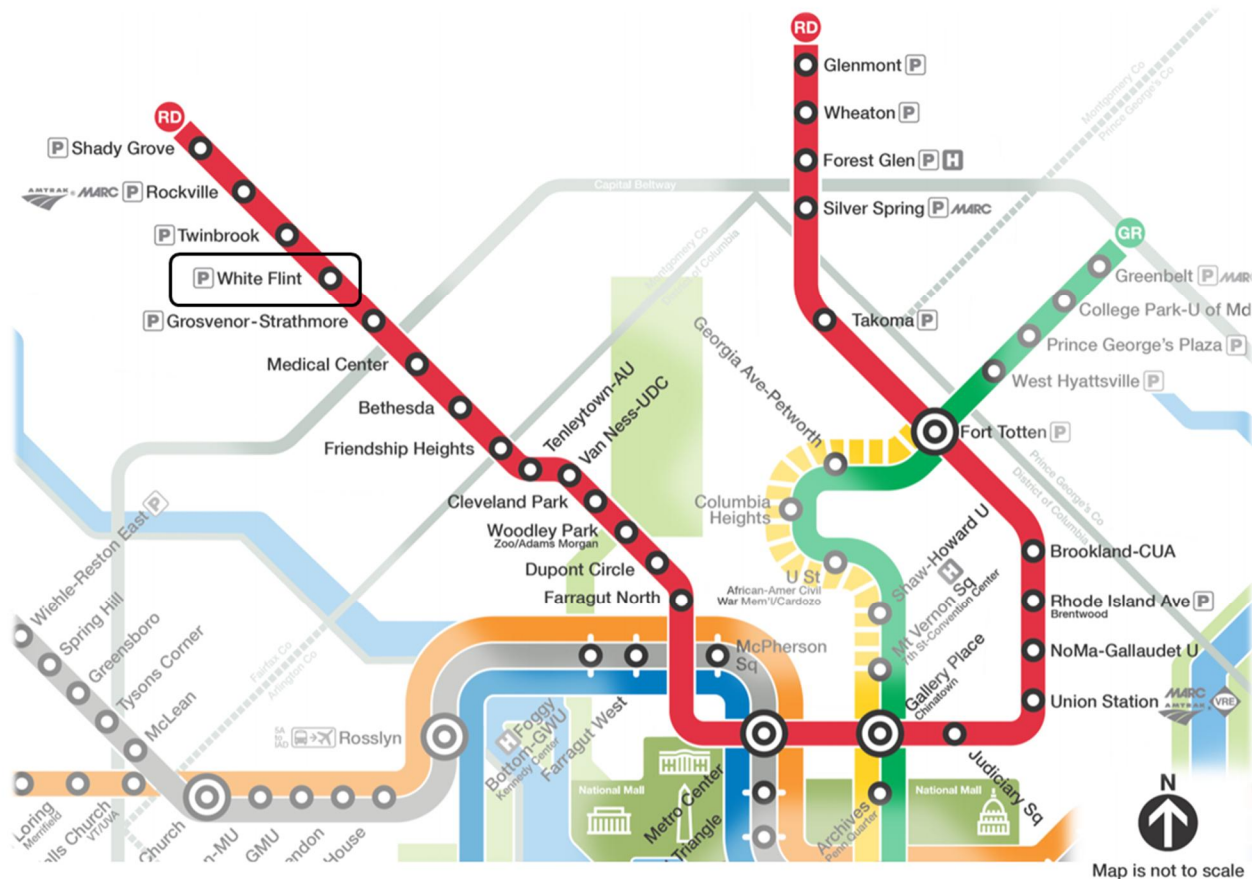


Figure 1: Red Line Map<sup>1</sup>

## 2.0 APPLICABLE CODES AND STANDARDS

- National Fire Protection Association: *NFPA 130, Standard for Fixed Guideway Transit and Passenger Rail Systems*, 2017 edition<sup>2</sup>.
- *Maryland Building Performance Standards (MBPS)*, which include the *International Building Code (IBC) 2015*, with Department of Housing and Community Development (DHCD) modifications.

<sup>1</sup> Excerpted from Metro System Map (<https://www.wmata.com/schedules/maps/upload/2017-System-Map.pdf>).

<sup>2</sup> Note: The 2014 edition of *NFPA 130* is referenced by the 2015 edition of *NFPA 1 Fire Code* §37.1, which is incorporated by reference by the State Fire Prevention Code (COMAR 29.06.01.06).

- *Maryland Building Rehabilitation Code (MBRC)* incorporating the *International Existing Building Code (IEBC) 2015*, with modifications.

### 3.0 *NFPA 130* USED IN CONJUNCTION WITH THE MARYLAND BUILDING PERFORMANCE STANDARDS (*MBPS*)

The approach to the application of life safety codes and standards for the design of the White Flint Station improvements is based on the use of *NFPA 130* in conjunction with the *MBPS* as applicable to the alteration of an existing rail station. *NFPA 130* life safety criteria, specifically the *NFPA 130* criteria for the evaluation of the means of egress of the public areas of the station, supersede the corresponding criteria of the *MBPS*. All new construction elements, components, systems, and spaces are designed to comply with the requirements of the *MBPS*, except where *NFPA 130* criteria apply.

### 4.0 APPLICATION OF *NFPA 130* AND THE *MBPS* AS PER MARYLAND BUILDING REHABILITATION CODE (*MBRC*) CRITERIA

The means of egress analysis for the White Flint Station improvements is based on the application of the criteria of the *MBRC* to the use of both the *MBRC* and *NFPA 130*. Specifically, for the relevant classification of building alteration per the *MBRC*, the applicability determined by the *MBRC* for a given requirement of the *MBPS* is also used for the corresponding life safety requirement of *NFPA 130*.<sup>3</sup>

## 5.0 EXISTING STATION AND PROPOSED IMPROVEMENTS

### 5.1 Existing Station Configuration (No-Build Alternative)

The existing station is an open-cut station<sup>4</sup>. The major public components of the station are:

- 1) A single center platform serving a westbound track and an eastbound track<sup>5</sup>, with a canopy covering the south half of the platform;
- 2) A mezzanine (the “south mezzanine”) at the south end of the station, located at grade, above below-grade non-public station spaces beyond the south end of the station, and covered by a roof and partially enclosed by exterior walls<sup>6</sup>;

---

<sup>3</sup> See Section 5 of the Technical Memorandum for the Application of Codes and Standards for WMATA Metrorail stations prepared under Task 11 of the Farragut North – Farragut Passageway feasibility study.

<sup>4</sup> While the station is directly open to the atmosphere, an engineering analysis would be required to determine whether the configuration of the station allows for smoke and heat to disperse directly into the atmosphere, and thus is considered under *NFPA 130* to be an “open station”.

<sup>5</sup> The meaning of the terms “westbound” and “eastbound” is relative to the general direction of travel of along the Red Line. Westbound at White Flint is considered toward Twinbrook (next station) and Shady Grove. Eastbound is considered toward Grosvenor-Strathmore (next station) and Silver Spring or Glenmont.

<sup>6</sup> Of the total perimeter of the existing south mezzanine, roughly one-fourth is made up of high walls, extending to the underside of the roof structure; roughly one-half is made up of high walls, extending approximately two-



- 3) Fare gates located on the south mezzanine;
- 4) A station entrance (the “south entrance”) at the south side of the south mezzanine, discharging to a paved area bounding the north sidewalk of Marinelli Road (with an exit discharge distance of approximately 50 feet).

The VCEs in the public circulation areas of the existing station include:

- 1) Two escalators from the platform to the south mezzanine;
- 2) One elevator from the platform to the south mezzanine.

## 5.2 Build Alternative

The build alternative being considered for White Flint Station adds the following features:

- 1) A new mezzanine (the “north mezzanine”) at the north end of the station, located at grade, partially above the existing platform and partially above below-grade non-public station spaces beyond the north end of the station, and covered by a roof and partially enclosed by exterior walls<sup>7</sup>;
- 2) Fare gates and an agent kiosk on the north mezzanine;
- 3) Station entrances (collectively referred to as the “north entrance”) at the west side (facing Rockville Pike) and east side of the new north mezzanine;
- 4) One new stair from the platform to the north mezzanine;
- 5) Two new elevators from the platform to the north mezzanine.

---

thirds of the height of the underside of the roof structure, with metal grillwork extending from the top of the wall to the underside of the roof structure; and the remainder, roughly one-fourth, is either completely open, or consists of metal grillwork extending to the underside of the roof structure.

<sup>7</sup> Of the total perimeter of the new north mezzanine, roughly one-fourth is made up of high walls, extending approximately two-thirds of the height of the underside of the roof structure; roughly one-half is made up of low parapets extending approximately one-third of the height of the underside of the roof structure; and the remainder, roughly one-fourth, is either completely open, or consists of metal grillwork extending approximately two-thirds of the height of the underside of the roof structure.

### 5.3 Comparison of Vertical Circulation Elements

The following table summarizes the comparison of the total number of VCEs (excluding emergency exit stairs) for the existing station and for the build alternative.

Table 1: Comparison of Vertical Circulation Elements

	TOTAL VCEs					
	Platform to South Mezzanine			Platform to North Mezzanine		
	Escalators	Stairways	Elevators	Escalators	Stairways	Elevators
Existing Station (No-Build Alternative)	2	0	1	—	—	—
Build Alternative	2	0	1	0	1	2

Note: The number of VCEs indicated in the table for the build alternative includes both existing and new VCEs.

## 6.0 CLASSIFICATION OF IMPROVEMENTS

### 6.1 Maryland Building Rehabilitation Code (MBRC) Classifications - Definitions

The *Maryland Building Rehabilitation Code (MBRC)* classifies improvements to buildings as additions, and as three levels of alterations defined as follows:

- Addition — an increase in (a) a building or a structure area; (b) aggregate floor area of a building or a structure<sup>8</sup>; (c) height of a building or a structure; or (d) number of stories of a building or a structure;
- Level 1 Alteration — the removal and replacement or the covering of existing materials, elements, equipment, or fixtures using new materials, elements, equipment, or fixtures that serve the same purpose;
- Level 2 Alteration — the reconfiguration of space, the addition or elimination of any door or window, the reconfiguration or extension of any system, or the installation of any additional equipment; and
- Level 3 Alteration — where the work area exceeds 50 percent of the aggregate area of the building. The work area is defined as the area of the reconfigured spaces.

<sup>8</sup> For the purposes of this report, new station mezzanines, or mezzanine expansions, that infill areas within the existing station footprint are not considered as contributing to aggregate floor area. See Sections 9.1 and 9.2 of the Technical Memorandum for the Application of Codes and Standards for WMATA Metrorail stations prepared under Task 11 of the Farragut North – Farragut Passageway feasibility study.



## 6.2 White Flint Station Build Alternative – MBRC Classifications

In accordance with the above MBRC criteria, the build alternative studied for the White Flint Station is classified as follows:

Table 2: Classification of Work

Area of Work	Classification
Portion of new north mezzanine above existing platform, new platform stair and elevators	Level 2 Alteration (work area ≤ 50% of aggregate building area)
Portion of new north mezzanine above existing below-grade non-public spaces beyond north end of platform, including new north station entrances	Addition

## 7.0 APPLICATION OF NFPA 130 CRITERIA

### 7.1 Use of NFPA 130 in Conjunction with the MBPS

In applying fire life safety criteria, the provisions of the MBPS are superseded by the corresponding applicable provisions of NFPA 130. The applicable provisions of the MBPS that are not addressed by NFPA 130 remain in effect. [Reference: NFPA 130, §5.1.2]

### 7.2 Application of NFPA 130 Means of Egress Criteria to Improvements to Metrorail Stations

In accordance with the guidance of NFPA 130 §1.3.3 and the criteria of the MBPS, the basis for applying NFPA 130 means of egress criteria to the design of the improvements to existing Metrorail stations, can be summarized as follows<sup>9</sup>:

- Addition: Where the means of egress of the existing station comply with NFPA 130 requirements that would apply to a new station, the addition must not compromise the means of egress features of the existing station. Where the means of egress of the existing station do not comply with NFPA 130 requirements that would apply to a new station, the addition must improve the existing means of egress of the station to an extent that is achievable and is acceptable to the AHJ.
- Level 3 Alteration: Where the means of egress of the existing station comply with NFPA 130 requirements that would apply to a new station, the alterations must not compromise the

<sup>9</sup> See Section 7 of the Technical Memorandum for the Application of Codes and Standards for WMATA Metrorail stations prepared under Task 11 of the Farragut North – Farragut Passageway feasibility study, for a detailed discussion.

means of egress features of the existing station. Where the means of egress of the existing station do not comply with *NFPA 130* requirements that would apply to a new station, the alterations must improve the existing means of egress of the station to an extent that is achievable and is acceptable to the AHJ.

- Level 2 Alteration: The alterations must not compromise the means of egress features of the existing station.
- Level 1 Alteration: The alterations must not compromise the means of egress features of the existing station.

### 7.3 Application of *NFPA 130* Means of Egress Criteria to the Build Alternatives Studied for the White Flint Station

Based on the above *MBRC* classification of the White Flint Station build alternative and on the above application of *NFPA 130* means of egress criteria to existing Metrorail stations, the Level 2 alterations require that the improvements do not compromise the existing means of egress features of the station. The new north mezzanine addition requires that the *NFPA 130* egress analyses demonstrate improvement to means of egress of the station as is achievable within the constraints of the existing station and station site, and as is acceptable to the AHJ.

## 8.0 *NFPA 130* EGRESS ANALYSES - METHODOLOGY AND ASSUMPTIONS

In accordance with the methodology of *NFPA 130*, the occupant load used for evaluating the adequacy of the egress elements from the public areas of a station is based on passenger demand forecasts for the AM and PM peak hours (8:00 – 9:00 and 17:00 – 18:00, respectively) for the station. The occupant load is made up of the following:

- Train Load (or Link Load) – all passengers on trains entering the station on all tracks
- Entraining Load – all passengers waiting to board the trains at all platforms

### 8.1 Passenger Demand Forecasts and Train Headways

An *NFPA 130* timed-egress spreadsheet analysis was prepared using the AM and PM peak passenger demand forecasts for 2023 for each of the three lines serving the station, based on (1) the Line Rider Profile from the WMATA 2023 Line Load application (for train loads), (2) existing mezzanine fare gate data, projected to 2023 (for entraining loads), and (3) the following planned headways:



Table 3: Peak Headways and Trains per Hour

Route ID	Origin Station	Destination Station	AM Peak Hour 8:00-9:00 Route Headway (minutes)	PM Peak Hour 17:00-18:00 Route Headway (minutes)
12	Shady Grove	Glenmont	8	8
14	Shady Grove	Glenmont	24 (2 trains)	-
15	Shady Grove	Silver Spring	8	8
18	Glenmont	Shady Grove	8	8
21	Silver Spring	Grosvenor-Strathmore	8	8

Note: 100% of peak period trains will be 8-car consists in 2023.

Based on the above, the maximum headways between any two consecutive trains arriving at White Flint in the same direction are as follows:

Table 4: Maximum Peak Headways Between Consecutive Trains

Direction	AM Peak Hour 8:00-9:00 Headway (minutes)	PM Peak Hour 17:00-18:00 Headway (minutes)
Eastbound (toward Grosvenor-Strathmore)	4	4
Westbound (toward Twinbrook)	8	8

The above assumes that the arrivals of eastbound trains on Route ID 12 and Route ID 15 alternate at equal 4-minute intervals, with each train arrival on Route 14 occurring within every sixth one of those 4-minute intervals. In the westbound direction, Route 21 trains arrive at 8-minute intervals; Route 18 trains do not stop at White Flint (since they terminate at Grosvenor-Strathmore). The assumed distribution of arrivals in the peak hour (whether AM or PM) is summarized in the table below.



Table 5: Assumed Distribution of Peak Hour Arrivals

Minute→	:00	:04	:08	:12	:14	:16	:20	:24	:28	:32	:36	:38	:40	:44	:48	:52	:56
<b>Eastbound:</b>																	
Route ID 12	●		●			●		●		●			●		●		●
Route ID 14					●							●					
Route ID 15		●		●			●		●		●			●		●	
<b>Westbound:</b>																	
Route ID—does not stop at White Flint																	
Route ID 21	●		●			●		●		●			●		●		●

### 8.2 Missed Headway

NFPA 130 requires the factoring of the train loads and the entraining loads for a service disruption. Accordingly, a missed headway factor of 2 is applied for the direction in which it will have the greatest effect—eastbound for the AM peak hour, and westbound for the PM peak hour.

In the egress calculations for White Flint Station, the missed-headway factor is applied to both the train loads per train headway and the entraining loads per train headway.

### 8.3 Maximum Train Passenger Capacity

The WMATA Manual of Design Criteria, Release 9 indicates a “normal maximum” of 160 passengers/car, which totals 1,280 passengers for 8-car train consists. This capacity does not reflect the higher capacity 175 passengers/car for the newer WMATA 7000 Series cars. Based on an AW2<sup>10</sup> maximum passenger capacity of 175 passengers/car for WMATA 7000 Series cars, and on 8-car train consists, the maximum train passenger capacity is 1,400 passengers.

For this analysis, the maximum capacity of 1,400 is used.

<sup>10</sup> Per the definition of “car, weight designations” given in Part 11 Glossary and Symbols of the Transportation Research Board’s TCRP 165 *Transit Capacity and Quality of Service Manual—3<sup>rd</sup> Edition*, AW2 is the rail car weight with average peak-hour passenger load, which is normally based on 0.4 p/ft<sup>2</sup> (4 passengers/m<sup>2</sup>) of floor space (in North America), after discounting space used for cabs, stairwells and seated passengers.





### 8.4 Train Loads

For the train loads the missed headway factor of 2 is applied to the link load per headway of trains in the peak direction during the peak period to account for a service disruption, but not to exceed the assumed maximum train passenger capacity of 1,400 passengers. Train loads are calculated for both peak direction and non-peak direction trains.

### 8.5 Entraining Loads

The calculation of entraining loads is based on the assumption that all passengers on the platform who are waiting for a train in a given direction will board the next train that enters the station in that direction, regardless of whether that train will stop at their destination station. The 2023 demand data assumes that approximately half of eastbound trains will terminate at Silver Spring, rather than at Glenmont, which is the eastern terminus of the Red Line. However, the number of passengers boarding eastbound trains at White Flint whose destination station is beyond Silver Spring is relatively very small—less than 1% of the total number of eastbound passengers boarding at White Flint.<sup>11</sup> In the westbound direction, every train stopping at White Flint stops at every station beyond White Flint.

The calculation of entraining loads assumes the worst case of two trains arriving in the station simultaneously (on the two tracks), so that the numbers of waiting passengers for each direction will

<sup>11</sup> The percentage of eastbound passengers boarding at White Flint whose destination station is beyond Silver Spring is calculated as follows:

		AM Peak Hour (8:00-9:00)		PM Peak Hour (17:00-18:00)	
		Projected (2023) w/o North Entrance	Projected (2023) w/ North Entrance	Projected (2023) w/o North Entrance	Projected (2023) w/ North Entrance
Passengers Boarding at White Flint:		8:00-9:00	8:00-9:00	17:00-18:00	17:00-18:00
Eastbound alighting beyond Silver Spring					
Alighting at Forest Glen		1	1	0	0
Alighting at Wheaton		0	0	0	2
Alighting at Glenmont		1	1	5	6
Line 1	Total eastbound alighting beyond Silver Spring	2	2	5	8
Westbound					
Alighting at Twin Brook		64	63	93	93
Alighting at Rockville		47	49	162	157
Alighting at Shady Grove		54	58	354	342
Line 2	Total westbound	165	170	609	592
Line 3	Total boarding at White Flint	2116	2176	1644	1635
Line 4 = Line 3 - Line 2	Total eastbound	1951	2006	1035	1043
Line 5 = Line 1 ÷ Line 4	Total eastbound alighting beyond Silver Spring ÷ Total eastbound	0.10%	0.10%	0.48%	0.77%



peak simultaneously. The missed headway factor of 2 is applied to the entraining load in the peak direction.

The entraining load calculation applies a surge factor of 1.3 to account for the peak within the peak hour.

### 8.6 Platform Occupant Loads

The table below summarizes the train and entraining loads per maximum headway, and the resulting platform loads, for the AM and PM peak hours.

Table 6: Platform Occupant Loads for AM and PM Peak Hours

		AM Peak Hour 8:00-9:00			PM Peak Hour 17:00-18:00		
		Peak Direction (East-bound)	Non-Peak Direction (West-bound)	Total	Peak Direction (West-bound)	Non-Peak Direction (East-bound)	Total
2023 No-Build	Train Load per Maximum Headway	1,400	404	1,804	1,400	141	1,541
	Entraining Load per Maximum Headway	346	24	370	169	97	266
	Total (Platform Occupant Load)	1,746	427	2,174	1,569	238	1,807
2023 Build	Train Load per Maximum Headway	1,400	405	1,805	1,400	141	1,541
	Entraining Load per Maximum Headway	353	25	378	172	96	268
	Total (Platform Occupant Load)	1,753	430	2,183	1,572	237	1,808

Note: Numbers may not add exactly due to rounding. Some PM peak hour figures may be smaller in the build alternative than in the no-build alternative, due to randomness in the demand forecast model<sup>12</sup>.

### 8.7 NFPA 130 Prescriptive Timed-Egress Criteria

Passenger travel speeds (assumed average speeds) and capacities of egress elements are based on the following prescribed *NFPA 130* values:

<sup>12</sup> During the temporal and spatial disaggregation of the mezzanine-to-mezzanine station demand and during the application of group-based growth factors.



Table 7: Prescribed Travel Speeds and Capacities

Element	<i>NFPA 130</i> prescribed value
Platform	124 feet/minute
Concourse	200 feet/minute
At grade	200 feet/minute
Stairs / escalators	48 feet/minute (vertical component)
Fare gate	50 people/minute
Single Leaf Door/ Gate	60 people/minute

## 8.8 Points of Safety

*NFPA 130* defines a point of safety as one of the following: (1) an enclosed exit that leads to a public way or safe location outside the station, trainway, or vehicle; (2) an at-grade point beyond the vehicle, enclosing station, or trainway; or (3) any other approved location.

The assumed points of safety at White Flint Station will be those at-grade points at which the egress paths become directly open to the atmosphere and smoke and heat can disperse directly into the atmosphere; these points are immediately outside the station entrances.

## 8.9 Prescriptive Platform Egress Requirements

### 8.9.1 Dimensions

*NFPA 130* prescribes the following for platform egress elements.

- Stairs must be at least 44 inches wide.
- Gate-type fare barriers in the means of egress shall provide a minimum clear width of 18 inches at and below a height of 39.5 inches and a minimum clear width of 21 inches above that height.

The requirements above would apply to such elements in a new station or addition to an existing station, and to such elements when they are added in an alteration of an existing station. There are no existing stairs for public egress, and all proposed stairs meet the prescriptive requirement for stairs. It is assumed that all existing and reconfigured fare gates meet the prescriptive dimensional requirements for fare barriers.

### 8.9.2 Escalators

*NFPA 130* requires that escalators shall not account for more than one-half of the required means of egress capacity at any one level unless the escalators are capable of being remotely brought to a stop and a portion of the means of egress capacity from each station level is stairs. In the existing condition,

the only egress from the platform is via escalators; there are no stairs from the platform level. In the build alternative, the *NFPA 130* requirement is met by the new stairs near the north end of the platform.

### 8.9.3 Elevators

To be counted as contributing to means of egress capacity, they must meet several *NFPA 130* requirements. At least one of the requirements, a holding area or lobby separated from the platform, is not met by the elevator in the existing condition nor by those in the build alternative. Thus, they are not counted as contributing to means of egress capacity.

### 8.9.4 Numbers and Locations

*NFPA 130* further prescribes for new stations the following number and locations of platform means of egress:

- At least two means of egress remote from each other are required to be provided from each platform;
- The maximum travel distance on the platform to a point at which a means of egress route leaves the platform shall not exceed 325 feet; and
- The common path of travel<sup>13</sup> from the ends of the platform shall not exceed 82 feet or one car length (which is 75 feet for Metrorail cars), whichever is greater.

In the no-build alternative, the requirement for two remote means of egress from the platform is not met; the only egress from the platform is via two side-by-side escalators near the south end of the platform, approximately 14 feet from each other. In the build alternative, the requirement for two remote means of egress is met by the provision of the new stair near the north end of the platform.

The travel and common path distances for the no-build and build alternatives are tabulated below. For the no-build alternative, because there is only a single means of egress from the platform, the longest common path of travel is the longest travel distance on the platform, plus the exit access distance to the exit discharge (at the south entrance).

---

<sup>13</sup> The common path of travel distance is the distance traveled before two means of egress are available, in effect the distance from the end of a platform to the first VCE.



Table 8: Travel Distance and Common Path

	AM Peak Hour 8:00-9:00		PM Peak Hour 17:00-18:00	
	Longest Travel Distance (feet)	Longest Common Path of Travel (feet)	Longest Travel Distance (feet)	Longest Common Path of Travel (feet)
2023 No-Build	600	708	600	708
2023 Build	248	104	248	104

### 8.10 Platform Evacuation Time

For a new station, *NFPA 130* requires sufficient egress capacity to evacuate the platform occupant load from the station platform in 4 minutes or less<sup>14</sup>. The calculated platform evacuation time for the no-build alternative (existing station layout with 2023 demand) greatly exceeds 4 minutes; the build alternative significantly reduces this time, but it still exceeds 4 minutes. The times are tabulated under 9.0 SPREADSHEET CALCULATION RESULTS below.

### 8.11 Evacuation to a Point of Safety

For a new station, *NFPA 130* requires that the station be designed to permit evacuation from the most remote point on the platform to a point of safety in 6 minutes or less. The calculated evacuation time to a point of safety for the no-build alternative greatly exceeds 6 minutes; the build alternative significantly reduces this time, but it still exceeds 6 minutes. The times are tabulated under 9. SPREADSHEET CALCULATION RESULTS below.

## 9.0 SPREADSHEET CALCULATION RESULTS

Table 9-1 summarizes the results of the spreadsheet calculations. The calculations are based on the assumption that one escalator at platform level is out of service.

<sup>14</sup> As per *NFPA 130* criteria, the platform egress elements are the points on the platform where the egress paths leave the platform. The platform occupant load is proportionally distributed to the egress elements (stairs, escalators, doors or gates) based on the dynamic capacity of each element.

Table 9: Summary Table of Spreadsheet Calculation Results<sup>15</sup>

	AM Peak Hour 8:00-9:00		PM Peak Hour 17:00-18:00	
	Platform Evacuation Time (minutes)	Evacuation Time to a Point of Safety (minutes)	Platform Evacuation Time (minutes)	Evacuation Time to a Point of Safety (minutes)
2023 No-Build	32.12	32.83	26.70	27.41
2023 Build	9.21	10.29	7.63	8.71

## 10.0 ACCESSIBLE MEANS OF EGRESS

In the build alternative for White Flint Station, the part of the new mezzanine above the existing platform, along with the new stairs and elevators between the platform and the new mezzanine, are considered to be Level 2 Alterations<sup>16</sup>. Therefore, accessible means of egress are not required, since per §1009.1, Exception 1, of *IBC* (2015) (incorporated by reference by the *MBPS*), accessible means of egress are not required in alterations to existing buildings. Nonetheless, we recommend at minimum the provision of advisory signage and a two-way communication system at the accessible elevators in the altered areas of the platform. The recommended signage and communication system would be as required by *IBC* (2015) for areas of refuge in an addition or in a new building.

The part of the new mezzanine above the existing below-grade non-public areas beyond the north end of the existing platform is considered to be an addition, and consequently, accessible means of egress must be provided for this part. Accessible means of egress are provided by the three new accessible station entrances at the same level as the mezzanine, opening to the west, north and east. Since passengers using wheelchairs can self-rescue using the accessible station entrances, no areas of rescue are required at the new mezzanine.

## 11.0 CONCLUSIONS

Based on platform occupant loads derived from the 2023 passenger demand forecasts and the train headways described above, the *NFPA 130* timed egress spreadsheet calculations shown in the results table in Section 9 above indicate:

<sup>15</sup> It should be noted that *NFPA 130* spreadsheet calculations are a methodology for evaluating the locations and capacities of the means of egress elements of a station, and are not intended to predict actual evacuation times.

<sup>16</sup> See Sections 9.1 and 9.2 of the Technical Memorandum for the Application of Codes and Standards for WMATA Metrorail stations prepared under Task 11 of the Farragut North – Farragut Passageway feasibility study.

- The analyzed build alternative shows significant improvements to the evacuation performance of the existing station, both for the platform evacuation time and the evacuation time to a point of safety. Therefore the build alternative meets the evacuation timed-egress criteria as applicable to an existing station, described in Section 7 of this Report.
- The existing station does not comply with the *NFPA 130* maximum travel distance of 325 feet to the nearest egress point on the platform. Under the build alternative, the longest travel distance is reduced and meets this requirement.
- The existing station configuration does not comply with the *NFPA 130* requirement for a minimum of two remote means of egress from the platform, nor with the limitation of common path travel distance to a maximum of 82 feet. The Build Alternative adds a second remote means of egress, with a common path travel distance of 104 feet, a substantial improvement over the existing common path of 708 feet.

## 12.0 GOING FORWARD – TO BE ADDRESSED

The following need items to be addressed going forward:

- Concurrence by Metro staff for the treatment of the portion of the new north mezzanine above the existing platform in the build alternative as a reconfiguration/alteration of the existing mezzanine level within the station footprint, rather than as an addition to the station, under the criteria of the *MBRC*. This is in accordance with the recommendations of Subsections 9.1 and 9.2 of the Technical Memorandum on the Application of Codes and Standards for Metrorail Stations, which was developed and coordinated with Metrorail staff.
- Concurrence by the WMATA that the build alternative meets the evacuation timed-egress criteria as applicable to an existing station, described in Section 7 of this report. This is in accordance with the methodologies for the application of *NFPA 130* criteria to the design of alterations and additions to existing Metrorail stations, as described in Section 7 of the Technical Memorandum on the Application of Codes and Standards for Metrorail Stations.
- Analysis of *NFPA 130* tenability criteria, as applied to an existing station, for the existing station and preferred build alternative. During the preliminary design phase of the project, the existing station and preferred build alternative should be assessed with respect to provision of a tenable environment along existing and new paths of egress from a fire. This is in accordance with the emergency ventilation requirements of *NFPA 130* for enclosed stations, as described in Subsection 6.4 of the Technical Memorandum on the Application of Codes and Standards for Metrorail Stations. It is also in accordance with the methodologies for the application of *NFPA 130*



criteria to the design of alterations and additions to existing Metrorail stations, as described in Section 7 of the Technical Memorandum.

## Appendix<sup>17</sup>

The appendix to the Egress Analysis includes:

- Part 1: Egress Calculations
- Part 2: Egress Diagrams

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<sup>17</sup> Appendix provided as a separate volume.



# Appendix

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Part 1: Egress Calculations

Part 2: Egress Diagrams

# Part 1: Egress Calculations

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**Job Title:** WMATA White Flint Station  
**Job Number:** 60589655  
**Job Location:** North Bethesda, MD  
**Revision:** 0  
**Sheet No.:** 1  
**Originator:** David Kluge  
**Reviewer:** Enoch Lipson  
**Calculation:** NFPA 130 (2017)  
**Date:** 4/9/2019

## Platform Load Summary

		AM Peak Hour 8:00-9:00			PM Peak Hour 17:00-18:00		
		Peak Direction (Eastbound)	Non-Peak Direction (Westbound)	Total	Peak Direction (Westbound)	Non-Peak Direction (Eastbound)	Total
2023 No-Build	Train Load per Maximum Headway	1,400	404	1,804	1,400	141	1,541
	Entraining Load per Maximum Headway	346	24	370	169	97	266
	Total (Platform Occupant Load)	1,746	427	2,174	1,569	238	1,807
2023 Build	Train Load per Maximum Headway	1,400	405	1,805	1,400	141	1,541
	Entraining Load per Maximum Headway	353	25	378	172	96	268
	Total (Platform Occupant Load)	1,753	430	2,183	1,572	237	1,808

Note: Numbers may not add exactly due to rounding. Some PM peak hour figures may be smaller in the build alternative than in the no-build

\*During the temporal and spatial disaggregation of the mezzanine-to-mezzanine station demand and during the application of group-based growth factors.

**Job Title:** WMATA White Flint Station  
**Job Number:** 60589655  
**Job Location:** North Bethesda, MD  
**Revision:** 0  
**Sheet No.:** 2  
**Originator:** David Kluge  
**Reviewer:** Enoch Lipson  
**Calculation:** NFPA 130 (2017)  
**Date:** 4/9/2019

**Job Title:** WMATA White Flint Station  
**Job Number:** 60589655  
**Job Location:** North Bethesda, MD  
**Revision:** 0  
**Sheet No.:** 3  
**Originator:** David Kluge  
**Reviewer:** Enoch Lipson  
**Calculation:** NFPA 130 (2017)  
**Date:** 4/9/2019

## Travel Distance and Common Path Summary

	AM Peak Hour 8:00-9:00		PM Peak Hour 17:00-18:00	
	Longest Travel Distance (feet)	Longest Common Path of Travel (feet)	Longest Travel Distance (feet)	Longest Common Path of Travel (feet)
2023 No-Build	600	708	600	708
2023 Build	248	104	248	104

## Egress Time Summary

	AM Peak Hour 8:00-9:00		PM Peak Hour 17:00-18:00	
	Platform Evacuation Time (minutes)	Time to a Point of Safety (minutes)	Platform Evacuation Time (minutes)	Time to a Point of Safety (minutes)
2023 No-Build	32.12	32.83	26.70	27.41
2023 Build	9.21	10.29	7.63	8.71

Job Title:  
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 Sheet No.:  
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 Calculation:  
 Date:

WMATA White Flint Station  
 60589655  
 North Bethesda, MD  
 0  
 4  
 David Kluge  
 Enoch Lipson  
 NFPA 130 (2017)  
 4/9/2019

## Occupant Load Calculation - AM Peak Hour - No-Build

### KEY

INPUT VALUES	User provided
CALCULATION	Do not modify

### 1.0 Occupancy and Operational Data

#### Remarks / EQUATION

2017 NFPA 130 Reference (5.3.1 and Annex C)

#### Maximum Headway

Peak Direction - Red Line Eastbound - From Shady Grove To Silver Spring/Glenmont	4 minutes	INPUT: Route ID 12 and Route ID 14 arrivals alternate at equal 4-minute intervals; Route ID 15 arrival occurs within every sixth 4-minute interval	5.3.2.1
Non-Peak Direction - Red Line Westbound - From Glenmont To Shady Grove	8 minutes	INPUT: Route ID 18 arrivals at equal 8-minute intervals	5.3.2.1

#### Peak Hour Link Load:

Peak Direction - Red Line Eastbound - From Shady Grove To Silver Spring/Glenmont	13,141 persons	From LineRiderProfile - Eastbound Riders leaving Twinbrook, 8:00 to 9:00	5.3.2.5
Non-Peak Direction - Red Line Westbound - From Glenmont To Shady Grove	2,328 persons	From LineRiderProfile - Westbound Riders leaving Grosvenor-Strathmore, 8:00 to 9:00	5.3.2.5

#### Peak Hour Link Load per Maximum Headway:

Peak Direction - Red Line Eastbound - From Shady Grove To Silver Spring/Glenmont	876 persons	= 13,141 persons x 4 minutes ÷ 60 minutes per hour	5.3.2.5
Non-Peak Direction - Red Line Westbound - From Glenmont To Shady Grove	310 persons	= 2,328 persons x 8 minutes ÷ 60 minutes per hour	5.3.2.5

#### Peak Hour Entraining Load:

Peak Direction - Red Line Eastbound - From Shady Grove To Silver Spring/Glenmont	1,999 persons	From LineRiderProfile - Eastbound Board at White Flint, 8:00 to 9:00	5.3.2.5
Non-Peak Direction - Red Line Westbound - From Glenmont To Shady Grove	137 persons	From LineRiderProfile - Westbound Board at White Flint, 8:00 to 9:00	5.3.2.5

#### Peak Hour Entraining Load per Maximum Headway:

Peak Direction - Red Line Eastbound - From Shady Grove To Silver Spring/Glenmont	133 persons	= 1,999 persons x 4 minutes ÷ 60 minutes per hour	5.3.2.5
Non-Peak Direction - Red Line Westbound - From Glenmont To Shady Grove	18 persons	= 137 persons x 8 minutes ÷ 60 minutes per hour	5.3.2.5

### 2.0 System and Vehicle Characteristics

System Surge Factor	1.3	INPUT: Factor applied to account for the peak 15 minutes during the peak hour--the "peak within the peak hour"	A.5.3.2.1
Missed Headway Factor for Red Line Eastbound - From Shady Grove To Silver Spring/Glenmont	2.0	INPUT: Factor representing service disruption in peak direction (one missed headway)	5.3.2.5(3), 5.3.2.5(6)
Maximum Train Load	1,400 persons	INPUT: Based on train consist of (8) 7000-Series cars at AW2 loading of 175 passengers per car	5.3.2.5(7)

### 3.0 Platform Occupant Load Calculation

#### Peak Hour Link Load per Maximum Headway x System Surge Factor x Missed Headway Factor (for Peak Direction only)

Peak Direction - Red Line Eastbound - From Shady Grove To Silver Spring/Glenmont	2,278 persons	= 876 persons x 1.3 x 2.0	A5.3.2.1, 5.3.2.5(6)
Non-Peak Direction - Red Line Westbound - From Glenmont To Shady Grove	404 persons	= 310 persons x 1.3	A5.3.2.1

#### Train Load - equal to lesser of:

Peak Hour Link Load per Maximum Headway x System Surge Factor x Missed Headway Factor (for Peak Direction only), or  
 Maximum Train Load

Peak Direction - Red Line Eastbound - From Shady Grove To Silver Spring/Glenmont	1,400 persons	= lesser of 2,278 persons or 1,400 persons	A5.3.2.1, 5.3.2.5(7)
Non-Peak Direction - Red Line Westbound - From Glenmont To Shady Grove	404 persons	= lesser of 404 persons or 1,400 persons	A5.3.2.1

#### Entraining Load - equal to Peak Hour Entraining Load per Maximum Headway x System Surge Factor x Missed Headway Factor (for Peak Direction only)

Peak Direction - Red Line Eastbound - From Shady Grove To Silver Spring/Glenmont	346 persons	= 133 persons x 1.3 x 2.0	A5.3.2.1, 5.3.2.5(3)
Non-Peak Direction - Red Line Westbound - From Glenmont To Shady Grove	24 persons	= 18 persons x 1.3	A5.3.2.1

#### Platform Occupant Load - equal to Train Load + Entraining Load

Peak Direction - Red Line Eastbound - From Shady Grove To Silver Spring/Glenmont	1,746 persons	= 1,400 persons + 346 persons	5.3.2.5(1)
Non-Peak Direction - Red Line Westbound - From Glenmont To Shady Grove	427 persons	= 404 persons + 24 persons	5.3.2.5(1)
Total - Peak Direction + Non-Peak Direction	2,174 persons	= 1,746 persons + 427 persons	5.3.2.5(2), 5.3.2.5(5)

**Job Title:** WMATA White Flint Station  
**Job Number:** 60589655  
**Job Location:** North Bethesda, MD  
**Revision:** 0  
**Sheet No.:** 5  
**Originator:** David Kluge  
**Reviewer:** Enoch Lipson  
**Calculation:** NFPA 130 (2017)  
**Date:** 4/9/2019

## Timed Egress Calculation - AM Peak Hour - No-Build

### KEY

INPUT VALUES	User provided
CALCULATION	Do not modify
NFPA Criteria	Modify only if directed

### INPUTS:

Egress Element	Direction	No. Elements	No. Usable	Width (inch)	people/inch/minute		Remarks / EQUATION	2017 NFPA 130 Reference
					(people/minute for fare gates)	people/minute		
<b>From Platform</b>								
Escalators	South Mezzanine	2	1	48	1.41	68	1 escalator discounted (NFPA 130)	5.3.5.3(1)/5.3.5.6
				Width: 48		68	Escalator Total	
						68	Platform Exit Capacity	
						100%	Percent Escalator Capacity (not to exceed 50% of Exit Capacity)	
<b>From Paid Area on Mezzanine</b>								
<i>South Mezzanine</i>								
Standard Fare Gate		4	4	---	50	200		5.3.8.4
ADA Fare Gate		1	1	---	50	50		5.3.8.4
Emergency Exit Gate		1	1	---	60	60		5.3.7.1(1), Table C.1.3, Table C.1.4
				Width: ---		310	Fare Barrier Exit Capacity	

**TEST NUMBER 1:** Evacuate platform occupant load from the platform in 4 minutes or less.

5.3.3.1

**F<sub>p</sub> (time to clear platform, in minutes) = Platform Occupant Load (people) / Platform Exit Capacity (people/minute)**

Platform Occupant Load	2,174	people
Platform Exit Capacity	68	people/minute
Time to Clear Platform (F <sub>p</sub> )	32.12	minutes

C.1.3a

Longest Travel Distance on platform to escalators toward South Mezzanine	600	feet/minute	124	Time to exit,	4.84	minutes	Queuing time is greater than travel time. Queuing time governs. Longest travel distance shall be less than 325 feet for a new station.	5.3.3.4, 5.3.4.4

**Test 1 Time** 32.12 minutes

**TEST NUMBER 2:** Evacuate platform occupant load from the most remote point on the platform to a point of safety in 6 minutes or less.

5.3.3.2

The area immediately outside each entrance structure is assumed to be the point of safety.

**Total Exit Time = T + W<sub>p</sub> + W<sub>f</sub>**

**Where: T = Total travel time**

**W<sub>p</sub> = Wait time at platform exits**

**W<sub>f</sub> = Wait time at subsequent egress element (e.g., fare barriers)**

**South Mezzanine**

**T = T<sub>1s</sub> + T<sub>2s</sub> + T<sub>3s</sub> + T<sub>4s</sub>**

- On Platform
- Platform Level to Concourse Level
- On Concourse to Faregates
- On Concourse from Faregates to Open Air
- Total Travel Time

	feet	fpm	minutes
T <sub>1s</sub>	600	124	4.84
T <sub>2s</sub>	16	48	0.33
T <sub>3s</sub>	39	200	0.20
T <sub>4s</sub>	37	200	0.19
T <sub>s</sub>			5.55

Vertical distance of vertical circulation element

5.3.5.3(2)

5.3.5.3

5.3.4.5

5.3.4.5

**Waiting Time at Platform Exits = Platform Exit Flow Time - Platform Walk Time**

**W<sub>p</sub> = F<sub>p</sub> - T<sub>1s</sub>**

- F<sub>ps</sub>
- T<sub>1s</sub>
- W<sub>ps</sub>

32.12	minutes
4.84	minutes
27.28	minutes

÷  
0

**Waiting Time at Fare Gates = Fare Barrier Flow Time - Platform Exit Flow Time**

**W<sub>f</sub> = F<sub>fb</sub> - F<sub>p</sub> if F<sub>fb</sub> > F<sub>p</sub>; W<sub>f</sub> = 0 otherwise**

- Concourse Occupant Load
- Fare Barrier Exit Capacity
- Fare Barrier Flow Time F<sub>fb</sub>
- F<sub>ps</sub>
- W<sub>fb</sub>

2174	people	= 68 people/minute (capacity of stairs to north mezzanine) x 32.12 minutes (time to clear platform)
310	people/minute	
7.01	minutes	
32.12	minutes	
0.00	minutes	

C.1.3b

**Total Exit Time = Total Travel Time + Waiting Time at Platform Exits + Waiting Time at Fare Gates + Waiting Time at Concourse Exits**

**Total Exit Time = T + W<sub>p</sub> + W<sub>fb</sub>**

- T<sub>s</sub>
- W<sub>ps</sub>
- W<sub>fb</sub>

5.55
27.28
0.00
<b>32.83</b>

minutes

**Total Exit Time South Mezzanine**

**Longest Common Path of Travel from Platform End**

**708** feet

Common path of travel shall not exceed 82 feet for a new WMATA station.

5.3.3.5

Measured from most remote point on platform to point of safety (because there are not two remote means of egress from the platform)

= 600 feet on platform + 16 feet ÷ sin 30° on escalator + 39 feet on concourse to faregates + 37 feet on concourse from faregates to open air

Job Title:  
 Job Number:  
 Job Location:  
 Revision:  
 Sheet No.:  
 Originator:  
 Reviewer:  
 Calculation:  
 Date:

WMATA White Flint Station  
 60589655  
 North Bethesda, MD  
 0  
 6  
 David Kluge  
 Enoch Lipson  
 NFPA 130 (2017)  
 4/9/2019

## Occupant Load Calculation - AM Peak Hour - Build

### KEY

INPUT VALUES	User provided
CALCULATION	Do not modify

1.0 Occupancy and Operational Data	Remarks / EQUATION	2017 NFPA 130 Reference (5.3.1 and Annex C)
<b>Maximum Headway</b>		
Peak Direction - Red Line Eastbound - From Shady Grove To Silver Spring/Glenmont	4 minutes	INPUT: Route ID 12 and Route ID 14 arrivals alternate at equal 4-minute intervals; Route ID 15 arrival occurs within every sixth 4-minute interval
Non-Peak Direction - Red Line Westbound - From Glenmont To Shady Grove	8 minutes	INPUT: Route ID 18 arrivals at equal 8-minute intervals
<b>Peak Hour Link Load:</b>		
Peak Direction - Red Line Eastbound - From Shady Grove To Silver Spring/Glenmont	13,192 persons	From LineRiderProfile - Eastbound Riders leaving Twinbrook, 8:00 to 9:00
Non-Peak Direction - Red Line Westbound - From Glenmont To Shady Grove	2,336 persons	From LineRiderProfile - Westbound Riders leaving Grosvenor-Strathmore, 8:00 to 9:00
<b>Peak Hour Link Load per Maximum Headway:</b>		
Peak Direction - Red Line Eastbound - From Shady Grove To Silver Spring/Glenmont	879 persons	= 13,192 persons x 4 minutes ÷ 60 minutes per hour
Non-Peak Direction - Red Line Westbound - From Glenmont To Shady Grove	311 persons	= 2,336 persons x 8 minutes ÷ 60 minutes per hour
<b>Peak Hour Entraining Load:</b>		
Peak Direction - Red Line Eastbound - From Shady Grove To Silver Spring/Glenmont	2,036 persons	From LineRiderProfile - Eastbound Board at White Flint, 8:00 to 9:00
Non-Peak Direction - Red Line Westbound - From Glenmont To Shady Grove	144 persons	From LineRiderProfile - Westbound Board at White Flint, 8:00 to 9:00
<b>Peak Hour Entraining Load per Maximum Headway:</b>		
Peak Direction - Red Line Eastbound - From Shady Grove To Silver Spring/Glenmont	136 persons	= 2,036 persons x 4 minutes ÷ 60 minutes per hour
Non-Peak Direction - Red Line Westbound - From Glenmont To Shady Grove	19 persons	= 144 persons x 8 minutes ÷ 60 minutes per hour
<b>2.0 System and Vehicle Characteristics</b>		
System Surge Factor	1.3	INPUT: Factor applied to account for the peak 15 minutes during the peak hour--the "peak within the peak hour"
Missed Headway Factor for Red Line Eastbound - From Shady Grove To Silver Spring/Glenmont	2.0	INPUT: Factor representing service disruption in peak direction (one missed headway)
Maximum Train Load	1,400 persons	INPUT: Based on train consist of (8) 7000-Series cars at AW2 loading of 175 passengers per car
<b>3.0 Platform Occupant Load Calculation</b>		
<b>Peak Hour Link Load per Maximum Headway x System Surge Factor x Missed Headway Factor (for Peak Direction only)</b>		5.3.2
Peak Direction - Red Line Eastbound - From Shady Grove To Silver Spring/Glenmont	2,287 persons	= 879 persons x 1.3 x 2.0
Non-Peak Direction - Red Line Westbound - From Glenmont To Shady Grove	405 persons	= 311 persons x 1.3
<b>Train Load - equal to lesser of:</b>		
<b>Peak Hour Link Load per Maximum Headway x System Surge Factor x Missed Headway Factor (for Peak Direction only), or</b>		
<b>Maximum Train Load</b>		
Peak Direction - Red Line Eastbound - From Shady Grove To Silver Spring/Glenmont	1,400 persons	= lesser of 2,287 persons or 1,400 persons
Non-Peak Direction - Red Line Westbound - From Glenmont To Shady Grove	405 persons	= lesser of 405 persons or 1,400 persons
<b>Entraining Load - equal to Peak Hour Entraining Load per Maximum Headway x System Surge Factor x Missed Headway Factor (for Peak Direction only)</b>		
Peak Direction - Red Line Eastbound - From Shady Grove To Silver Spring/Glenmont	353 persons	= 136 persons x 1.3 x 2.0
Non-Peak Direction - Red Line Westbound - From Glenmont To Shady Grove	25 persons	= 19 persons x 1.3
<b>Platform Occupant Load - equal to Train Load + Entraining Load</b>		
Peak Direction - Red Line Eastbound - From Shady Grove To Silver Spring/Glenmont	1,753 persons	= 1,400 persons + 353 persons
Non-Peak Direction - Red Line Westbound - From Glenmont To Shady Grove	430 persons	= 405 persons + 25 persons
<b>Total - Peak Direction + Non-Peak Direction</b>	<b>2,183 persons</b>	= 1,753 persons + 430 persons



**Job Title:** WMATA White Flint Station  
**Job Number:** 60589655  
**Job Location:** North Bethesda, MD  
**Revision:** 0  
**Sheet No.:** 7  
**Originator:** David Kluge  
**Reviewer:** Enoch Lipson  
**Calculation:** NFPA 130 (2017)  
**Date:** 4/9/2019

## Timed Egress Calculation - AM Peak Hour - Build

### KEY

INPUT VALUES	User provided
CALCULATION	Do not modify
NFPA Criteria	Modify only if directed

### INPUTS:

Egress Element	Direction	No. Elements	No. Usable	Width (inch)	people/inch/minute		Remarks / EQUATION	2017 NFPA 130 Reference
					(people/minute for fare gates)	people/minute		
<b>From Platform</b>								
Stairs	North Mezzanine	1	1	120	1.41	169		5.3.5.3(1)
Escalators	South Mezzanine	2	1	48	1.41	68	1 escalator discounted (NFPA 130)	5.3.5.3(1)/5.3.5.6
				Width: 168		68	Escalator Total	
						237	Platform Exit Capacity	
						29%	Percent Escalator Capacity (not to exceed 50% of Exit Capacity)	5.3.5.4/ 5.3.5.5
<b>From Paid Area on Mezzanine</b>								
<i>North Mezzanine</i>								
Standard Fare Gate		4	4	---	50	200		5.3.8.4
ADA Fare Gate		1	1	---	50	50		5.3.8.4
Emergency Exit Gate		1	1	---	60	60		5.3.7.1(1), Table C.1.3, Table C.1.4
				Width: ---		310	Fare Barrier Exit Capacity	
<i>South Mezzanine</i>								
Standard Fare Gate		4	4	---	50	200		5.3.8.4
ADA Fare Gate		1	1	---	50	50		5.3.8.4
Emergency Exit Gate		1	1	---	60	60		5.3.7.1(1), Table C.1.3, Table C.1.4
				Width: ---		310	Fare Barrier Exit Capacity	

**TEST NUMBER 1:** Evacuate platform occupant load from the platform in 4 minutes or less.

5.3.3.1

**F<sub>p</sub> (time to clear platform, in minutes) = Platform Occupant Load (people) / Platform Exit Capacity (people/minute)**

Platform Occupant Load	2,183	people
Platform Exit Capacity	237	people/minute
Time to Clear Platform (F <sub>p</sub> )	9.21	minutes

C.1.3a

	feet/minute	124	Time to exit,			
			feet/minute	minutes		
Longest Travel Distance on platform to stairs toward North Mezzanine	248	124	2.00	2.00	Queuing time is greater than travel time. Queuing time governs.	5.3.3.4, 5.3.4.4
Longest Travel Distance on platform to escalators toward South Mezzanine	248	124	2.00	2.00	Longest travel distance shall be less than 325 feet for a new station. Queuing time is greater than travel time. Queuing time governs.	5.3.3.4, 5.3.4.4
					Longest travel distance shall be less than 325 feet for a new station.	

**Test 1 Time** 9.21 minutes

**TEST NUMBER 2:** Evacuate platform occupant load from the most remote point on the platform to a point of safety in 6 minutes or less.

5.3.3.2

The area immediately outside each entrance structure is assumed to be the point of safety.

**Total Exit Time = T + W<sub>p</sub> + W<sub>f</sub>**

**Where: T = Total travel time**

**W<sub>p</sub> = Wait time at platform exits**

**W<sub>f</sub> = Wait time at subsequent egress element (e.g., fare barriers)**

**North Mezzanine**

**T = T<sub>1n</sub> + T<sub>2n</sub> + T<sub>3n</sub> + T<sub>4n</sub>**

- On Platform
- Platform Level to Concourse Level
- On Concourse to Faregates
- On Concourse from Faregates to Open Air
- Total Travel Time

	feet	fpm	minutes
T <sub>1n</sub>	248	124	2.00
T <sub>2n</sub>	15	48	0.31
T <sub>3n</sub>	115	200	0.58
T <sub>4n</sub>	38	200	0.19
T <sub>n</sub>			3.08

Vertical distance of vertical circulation element

5.3.4.4  
5.3.5.3(2)  
5.3.4.5  
5.3.4.5

**Waiting Time at Platform Exits = Platform Exit Flow Time - Platform Walk Time**

**W<sub>pn</sub> = F<sub>pn</sub> - T<sub>1n</sub>**

- F<sub>pn</sub>
- T<sub>1n</sub>
- W<sub>pn</sub>

9.21	minutes
2.00	minutes
7.21	minutes

**Waiting Time at Fare Gates = Fare Barrier Flow Time - Platform Exit Flow Time**

**W<sub>f</sub> = F<sub>fb</sub> - F<sub>p</sub> if F<sub>fb</sub> > F<sub>p</sub>; W<sub>f</sub> = 0 otherwise**

- Concourse Occupant Load
- Fare Barrier Exit Capacity
- Fare Barrier Flow Time F<sub>fbn</sub>
- F<sub>pn</sub>
- W<sub>fbn</sub>

1559	people	= 169 people/minute (capacity of stairs to north mezzanine) x 9.21 minutes (time to clear platform)
310	people/minute	
5.03	minutes	
9.21	minutes	
0.00	minutes	

C.1.3b

**Total Exit Time = Total Travel Time + Waiting Time at Platform Exits + Waiting Time at Fare Gates**

**Total Exit Time = T + W<sub>p</sub> + W<sub>fb</sub>**

- T<sub>n</sub>
- W<sub>pn</sub>
- W<sub>fbn</sub>

3.08	
7.21	
0.00	
10.29	minutes

**Total Exit Time North Mezzanine**

**South Mezzanine**

**T = T<sub>1s</sub> + T<sub>2s</sub> + T<sub>3s</sub> + T<sub>4s</sub>**

- On Platform
- Platform Level to Concourse Level
- On Concourse to Faregates
- On Concourse from Faregates to Open Air
- Total Travel Time

	feet	fpm	minutes
T <sub>1s</sub>	248	124	2.00
T <sub>2s</sub>	16	48	0.33
T <sub>3s</sub>	39	200	0.20
T <sub>4s</sub>	37	200	0.19
T <sub>s</sub>			2.71

Vertical distance of vertical circulation element

5.3.5.3(2)  
5.3.5.3  
5.3.4.5  
5.3.4.5

**Waiting Time at Platform Exits = Platform Exit Flow Time - Platform Walk Time**

**W<sub>p</sub> = F<sub>p</sub> - T<sub>1s</sub>**

- F<sub>ps</sub>

9.21	minutes
------	---------

$T_{1s}$	2.00	minutes
$W_{ps}$	7.21	minutes

**Waiting Time at Fare Gates = Fare Barrier Flow Time - Platform Exit Flow Time**

$W_f = F_{fb} - F_p$  if  $F_{fb} > F_p$ ;  $W_f = 0$  otherwise

Concourse Occupant Load	624	people	= 68 people/minute (capacity of stairs to north mezzanine) x 9.21 minutes (time to clear platform)
Fare Barrier Exit Capacity	310	people/minute	
Fare Barrier Flow Time $F_{fbs}$	2.01	minutes	
$F_{ps}$	9.21	minutes	
$W_{fbs}$	0.00	minutes	

C.1.3b

**Total Exit Time = Total Travel Time + Waiting Time at Platform Exits + Waiting Time at Fare Gates + Waiting Time at Concourse Exits**

$Total\ Exit\ Time = T + W_p + W_{fb}$

$T_s$	2.71	
$W_{ps}$	7.21	
$W_{fbs}$	0.00	

**Total Exit Time South Mezzanine** 9.93 minutes

**Total Exit Time** 10.29 minutes

**Longest Common Path of Travel from Platform End**

104 feet

Common path of travel shall not exceed 82 feet for a new WMATA station.

5.3.3.5

Job Title:  
 Job Number:  
 Job Location:  
 Revision:  
 Sheet No.:  
 Originator:  
 Reviewer:  
 Calculation:  
 Date:

WMATA White Flint Station  
 60589655  
 North Bethesda, MD  
 0  
 8  
 David Kluge  
 Enoch Lipson  
 NFPA 130 (2017)  
 4/9/2019

## Occupant Load Calculation - PM Peak Hour - No-Build

### KEY

INPUT VALUES	User provided
CALCULATION	Do not modify

1.0 Occupancy and Operational Data	Remarks / EQUATION	2017 NFPA 130 Reference (5.3.1 and Annex C)
<b>Maximum Headway</b>		
Peak Direction - Red Line Westbound - From Glenmont to Shady Grove	8 minutes	INPUT: Route ID 18 arrivals at equal 8-minute intervals 5.3.2.1
Non-Peak Direction - Red Line Eastbound - From Shady Grove to Silver Spring/Glenmont	4 minutes	INPUT: Route ID 12 and Route ID 14 arrivals alternate at equal 4-minute intervals; Route ID 15 arrival occurs within every sixth 4-minute interval 5.3.2.1
<b>Peak Hour Link Load:</b>		
Peak Direction - Red Line Westbound - From Glenmont to Shady Grove	13,989 persons	From LineRiderProfile - Westbound Riders leaving Grosvenor-Strathmore, 17:00 to 18:00 5.3.2.5
Non-Peak Direction - Red Line Eastbound - From Shady Grove to Silver Spring/Glenmont	1,625 persons	From LineRiderProfile - Eastbound Riders leaving Twinbrook, 17:00 to 18:00 5.3.2.5
<b>Peak Hour Link Load per Maximum Headway:</b>		
Peak Direction - Red Line Westbound - From Glenmont to Shady Grove	1,865 persons	= 13,989 persons x 8 minutes ÷ 60 minutes per hour 5.3.2.5
Non-Peak Direction - Red Line Eastbound - From Shady Grove to Silver Spring/Glenmont	108 persons	= 1,625 persons x 4 minutes ÷ 60 minutes per hour 5.3.2.5
<b>Peak Hour Entraining Load:</b>		
Peak Direction - Red Line Westbound - From Glenmont to Shady Grove	487 persons	From LineRiderProfile - Westbound Board at White Flint, 17:00 to 18:00 5.3.2.5
Non-Peak Direction - Red Line Eastbound - From Shady Grove to Silver Spring/Glenmont	1,121 persons	From LineRiderProfile - Eastbound Board at White Flint, 17:00 to 18:00 5.3.2.5
<b>Peak Hour Entraining Load per Maximum Headway:</b>		
Peak Direction - Red Line Westbound - From Glenmont to Shady Grove	65 persons	= 487 persons x 8 minutes ÷ 60 minutes per hour 5.3.2.5
Non-Peak Direction - Red Line Eastbound - From Shady Grove to Silver Spring/Glenmont	75 persons	= 1,121 persons x 4 minutes ÷ 60 minutes per hour 5.3.2.5
<b>2.0 System and Vehicle Characteristics</b>		
System Surge Factor	1.3	INPUT: Factor applied to account for the peak 15 minutes during the peak hour--the "peak within the peak hour" A.5.3.2.1
Missed Headway Factor for Red Line Westbound - From Silver Spring/Glenmont To Shady Grove	2.0	INPUT: Factor representing service disruption in peak direction (one missed headway) 5.3.2.5(3), 5.3.2.5(6)
Maximum Train Load	1,400 persons	INPUT: Based on train consist of (8) 7000-Series cars at AW2 loading of 175 passengers per car 5.3.2.5(7)
<b>3.0 Platform Occupant Load Calculation</b>		
<b>Peak Hour Link Load per Maximum Headway x System Surge Factor x Missed Headway Factor (for Peak Direction only)</b>		
Peak Direction - Red Line Westbound - From Glenmont to Shady Grove	4,850 persons	= 1,865 persons x 1.3 x 2.0 A5.3.2.1, 5.3.2.5(6)
Non-Peak Direction - Red Line Eastbound - From Shady Grove to Silver Spring/Glenmont	141 persons	= 108 persons x 1.3 A5.3.2.1
<b>Train Load - equal to lesser of:</b>		
<b>Peak Hour Link Load per Maximum Headway x System Surge Factor x Missed Headway Factor (for Peak Direction only), or</b>		
<b>Maximum Train Load</b>		
Peak Direction - Red Line Westbound - From Glenmont to Shady Grove	1,400 persons	= lesser of 4,850 persons or 1,400 persons A5.3.2.1, 5.3.2.5(7)
Non-Peak Direction - Red Line Eastbound - From Shady Grove to Silver Spring/Glenmont	141 persons	= lesser of 141 persons or 1,400 persons A5.3.2.1
<b>Entraining Load - equal to Peak Hour Entraining Load per Maximum Headway x System Surge Factor x Missed Headway Factor (for Peak Direction only)</b>		
Peak Direction - Red Line Westbound - From Glenmont to Shady Grove	169 persons	= 65 persons x 1.3 x 2.0 A5.3.2.1, 5.3.2.5(3)
Non-Peak Direction - Red Line Eastbound - From Shady Grove to Silver Spring/Glenmont	97 persons	= 75 persons x 1.3 A5.3.2.1
<b>Platform Occupant Load - equal to Train Load + Entraining Load</b>		
Peak Direction - Red Line Westbound - From Glenmont to Shady Grove	1,569 persons	= 1,400 persons + 169 persons 5.3.2.5(1)
Non-Peak Direction - Red Line Eastbound - From Shady Grove to Silver Spring/Glenmont	238 persons	= 141 persons + 97 persons 5.3.2.5(1)
<b>Total - Peak Direction + Non-Peak Direction</b>	<b>1,807 persons</b>	= 1,569 persons + 238 persons 5.3.2.5(2), 5.3.2.5(5)

**Job Title:** WMATA White Flint Station  
**Job Number:** 60589655  
**Job Location:** North Bethesda, MD  
**Revision:** 0  
**Sheet No.:** 9  
**Originator:** David Kluge  
**Reviewer:** Enoch Lipson  
**Calculation:** NFPA 130 (2017)  
**Date:** 4/9/2019

## Timed Egress Calculation - PM Peak Hour - No-Build

### KEY

INPUT VALUES	User provided
CALCULATION	Do not modify
NFPA Criteria	Modify only if directed

### INPUTS:

Egress Element	Direction	No. Elements	No. Usable	Width (inch)	people/inch/minute		Remarks / EQUATION	2017 NFPA 130 Reference
					(people/minute for fare gates)	people/minute		
<b>From Platform</b>								
Escalators	South Mezzanine	2	1	48	1.41	68	1 escalator discounted (NFPA 130)	5.3.5.3(1)/5.3.5.6
				Width: 48		68	Escalator Total	
						68	Platform Exit Capacity	
						100%	Percent Escalator Capacity (not to exceed 50% of Exit Capacity)	
<b>From Paid Area on Mezzanine</b>								
<i>South Mezzanine</i>								
Standard Fare Gate		4	4	---	50	200		5.3.8.4
ADA Fare Gate		1	1	---	50	50		5.3.8.4
Emergency Exit Gate		1	1	---	60	60		5.3.7.1(1), Table C.1.3, Table C.1.4
				Width: ---		310	Fare Barrier Exit Capacity	

**TEST NUMBER 1:** Evacuate platform occupant load from the platform in 4 minutes or less.

5.3.3.1

**F<sub>p</sub> (time to clear platform, in minutes) = Platform Occupant Load (people) / Platform Exit Capacity (people/minute)**

Platform Occupant Load	1,807	people
Platform Exit Capacity	68	people/minute
Time to Clear Platform (F <sub>p</sub> )	26.70	minutes

C.1.3a

Longest Travel Distance on platform to escalators toward South Mezzanine	600	feet/minute	124	Time to exit,	4.84	minutes	Queuing time is greater than travel time. Queuing time governs. Longest travel distance shall be less than 325 feet for a new station.	5.3.3.4, 5.3.4.4

**Test 1 Time** 26.70 minutes

**TEST NUMBER 2:** Evacuate platform occupant load from the most remote point on the platform to a point of safety in 6 minutes or less.

5.3.3.2

The area immediately outside each entrance structure is assumed to be the point of safety.

**Total Exit Time = T + W<sub>p</sub> + W<sub>f</sub>**

**Where: T = Total travel time**

**W<sub>p</sub> = Wait time at platform exits**

**W<sub>f</sub> = Wait time at subsequent egress element (e.g., fare barriers)**

**South Mezzanine**

**T = T<sub>1s</sub> + T<sub>2s</sub> + T<sub>3s</sub> + T<sub>4s</sub>**

- On Platform
- Platform Level to Concourse Level
- On Concourse to Faregates
- On Concourse from Faregates to Open Air
- Total Travel Time

	feet	fpm	minutes
T <sub>1s</sub>	600	124	4.84
T <sub>2s</sub>	16	48	0.33
T <sub>3s</sub>	39	200	0.20
T <sub>4s</sub>	37	200	0.19
T <sub>s</sub>			5.55

Vertical distance of vertical circulation element

5.3.5.3(2)

5.3.5.3

5.3.4.5

5.3.4.5

**Waiting Time at Platform Exits = Platform Exit Flow Time - Platform Walk Time**

**W<sub>p</sub> = F<sub>p</sub> - T<sub>1s</sub>**

- F<sub>ps</sub>
- T<sub>1s</sub>
- W<sub>ps</sub>

F <sub>ps</sub>	26.70	minutes
T <sub>1s</sub>	4.84	minutes
W <sub>ps</sub>	21.86	minutes

**Waiting Time at Fare Gates = Fare Barrier Flow Time - Platform Exit Flow Time**

**W<sub>f</sub> = F<sub>fb</sub> - F<sub>p</sub> if F<sub>fb</sub> > F<sub>p</sub>; W<sub>f</sub> = 0 otherwise**

- Concourse Occupant Load
- Fare Barrier Exit Capacity
- Fare Barrier Flow Time F<sub>fb</sub>
- F<sub>ps</sub>
- W<sub>fb</sub>

Concourse Occupant Load	1807	people	= 68 people/minute (capacity of stairs to north mezzanine) x 26.70 minutes (time to clear platform)
Fare Barrier Exit Capacity	310	people/minute	
Fare Barrier Flow Time F <sub>fb</sub>	5.83	minutes	
F <sub>ps</sub>	26.70	minutes	
W <sub>fb</sub>	0.00	minutes	

C.1.3b

**Total Exit Time = Total Travel Time + Waiting Time at Platform Exits + Waiting Time at Fare Gates + Waiting Time at Concourse Exits**

**Total Exit Time = T + W<sub>p</sub> + W<sub>fb</sub>**

- T<sub>s</sub>
- W<sub>ps</sub>
- W<sub>fb</sub>

T <sub>s</sub>	5.55	
W <sub>ps</sub>	21.86	
W <sub>fb</sub>	0.00	
<b>Total Exit Time South Mezzanine</b>	<b>27.41</b>	minutes

**Longest Common Path of Travel from Platform End**

**708** feet

Common path of travel shall not exceed 82 feet for a new WMATA station.

5.3.3.5

Measured from most remote point on platform to point of safety (because there are not two remote means of egress from the platform)

= 600 feet on platform + 16 feet ÷ sin 30° on escalator + 39 feet on concourse to faregates + 37 feet on concourse from faregates to open air

Job Title:  
 Job Number:  
 Job Location:  
 Revision:  
 Sheet No.:  
 Originator:  
 Reviewer:  
 Calculation:  
 Date:

WMATA White Flint Station  
 60589655  
 North Bethesda, MD  
 0  
 10  
 David Kluge  
 Enoch Lipson  
 NFPA 130 (2017)  
 4/9/2019

## Occupant Load Calculation - PM Peak Hour - Build

### KEY

INPUT VALUES	User provided
CALCULATION	Do not modify

1.0 Occupancy and Operational Data	Remarks / EQUATION	2017 NFPA 130 Reference (5.3.1 and Annex C)
<b>Maximum Headway</b>		
Peak Direction - Red Line Westbound - From Glenmont to Shady Grove	8 minutes	INPUT: Route ID 18 arrivals at equal 8-minute intervals 5.3.2.1
Non-Peak Direction - Red Line Eastbound - From Shady Grove to Silver Spring/Glenmont	4 minutes	INPUT: Route ID 12 and Route ID 14 arrivals alternate at equal 4-minute intervals; Route ID 15 arrival occurs within every sixth 4-minute interval 5.3.2.1
<b>Peak Hour Link Load:</b>		
Peak Direction - Red Line Westbound - From Glenmont to Shady Grove	13,968 persons	From LineRiderProfile - Westbound Riders leaving Grosvenor-Strathmore, 17:00 to 18:00 5.3.2.5
Non-Peak Direction - Red Line Eastbound - From Shady Grove to Silver Spring/Glenmont	1,624 persons	From LineRiderProfile - Eastbound Riders leaving Twinbrook, 17:00 to 18:00 5.3.2.5
<b>Peak Hour Link Load per Maximum Headway:</b>		
Peak Direction - Red Line Westbound - From Glenmont to Shady Grove	1,862 persons	= 13,968 persons x 8 minutes ÷ 60 minutes per hour 5.3.2.5
Non-Peak Direction - Red Line Eastbound - From Shady Grove to Silver Spring/Glenmont	108 persons	= 1,624 persons x 4 minutes ÷ 60 minutes per hour 5.3.2.5
<b>Peak Hour Entraining Load:</b>		
Peak Direction - Red Line Westbound - From Glenmont to Shady Grove	495 persons	From LineRiderProfile - Westbound Board at White Flint, 17:00 to 18:00 5.3.2.5
Non-Peak Direction - Red Line Eastbound - From Shady Grove to Silver Spring/Glenmont	1,109 persons	From LineRiderProfile - Eastbound Board at White Flint, 17:00 to 18:00 5.3.2.5
<b>Peak Hour Entraining Load per Maximum Headway:</b>		
Peak Direction - Red Line Westbound - From Glenmont to Shady Grove	66 persons	= 495 persons x 8 minutes ÷ 60 minutes per hour 5.3.2.5
Non-Peak Direction - Red Line Eastbound - From Shady Grove to Silver Spring/Glenmont	74 persons	= 1,109 persons x 4 minutes ÷ 60 minutes per hour 5.3.2.5
<b>2.0 System and Vehicle Characteristics</b>		
System Surge Factor	1.3	INPUT: Factor applied to account for the peak 15 minutes during the peak hour--the "peak within the peak hour" A.5.3.2.1
Missed Headway Factor for Red Line Westbound - From Silver Spring/Glenmont To Shady Grove	2.0	INPUT: Factor representing service disruption in peak direction (one missed headway) 5.3.2.5(3), 5.3.2.5(6)
Maximum Train Load	1,400 persons	INPUT: Based on train consist of (8) 7000-Series cars at AW2 loading of 175 passengers per car 5.3.2.5(7)
<b>3.0 Platform Occupant Load Calculation</b>		
<b>Peak Hour Link Load per Maximum Headway x System Surge Factor x Missed Headway Factor (for Peak Direction only)</b>		
Peak Direction - Red Line Westbound - From Glenmont to Shady Grove	4,842 persons	= 1,862 persons x 1.3 x 2.0 A5.3.2.1, 5.3.2.5(6)
Non-Peak Direction - Red Line Eastbound - From Shady Grove to Silver Spring/Glenmont	141 persons	= 108 persons x 1.3 A5.3.2.1
<b>Train Load - equal to lesser of: Peak Hour Link Load per Maximum Headway x System Surge Factor x Missed Headway Factor (for Peak Direction only), or Maximum Train Load</b>		
Peak Direction - Red Line Westbound - From Glenmont to Shady Grove	1,400 persons	= lesser of 4,842 persons or 1,400 persons A5.3.2.1, 5.3.2.5(7)
Non-Peak Direction - Red Line Eastbound - From Shady Grove to Silver Spring/Glenmont	141 persons	= lesser of 141 persons or 1,400 persons A5.3.2.1
<b>Entraining Load - equal to Peak Hour Entraining Load per Maximum Headway x System Surge Factor x Missed Headway Factor (for Peak Direction only)</b>		
Peak Direction - Red Line Westbound - From Glenmont to Shady Grove	172 persons	= 66 persons x 1.3 x 2.0 A5.3.2.1, 5.3.2.5(3)
Non-Peak Direction - Red Line Eastbound - From Shady Grove to Silver Spring/Glenmont	96 persons	= 74 persons x 1.3 A5.3.2.1
<b>Platform Occupant Load - equal to Train Load + Entraining Load</b>		
Peak Direction - Red Line Westbound - From Glenmont to Shady Grove	1,572 persons	= 1,400 persons + 172 persons 5.3.2.5(1)
Non-Peak Direction - Red Line Eastbound - From Shady Grove to Silver Spring/Glenmont	237 persons	= 141 persons + 96 persons 5.3.2.5(1)
<b>Total - Peak Direction + Non-Peak Direction</b>	<b>1,808 persons</b>	= 1,572 persons + 237 persons 5.3.2.5(2), 5.3.2.5(5)

**Job Title:** WMATA White Flint Station  
**Job Number:** 60589655  
**Job Location:** North Bethesda, MD  
**Revision:** 0  
**Sheet No.:** 11  
**Originator:** David Kluge  
**Reviewer:** Enoch Lipson  
**Calculation:** NFPA 130 (2017)  
**Date:** 4/9/2019

## Timed Egress Calculation - PM Peak Hour - Build

### KEY

INPUT VALUES	User provided
CALCULATION	Do not modify
NFPA Criteria	Modify only if directed

### INPUTS:

Egress Element	Direction	No. Elements	No. Usable	Width (inch)	people/inch/minute		Remarks / EQUATION	2017 NFPA 130 Reference
					(people/minute for fare gates)	people/minute		
<b>From Platform</b>								
Stairs	North Mezzanine	1	1	120	1.41	169		5.3.5.3(1)
Escalators	South Mezzanine	2	1	48	1.41	68	1 escalator discounted (NFPA 130)	5.3.5.3(1)/5.3.5.6
				Width: 168		68	Escalator Total	
						237	Platform Exit Capacity	
						29%	Percent Escalator Capacity (not to exceed 50% of Exit Capacity)	5.3.5.4/ 5.3.5.5
<b>From Paid Area on Mezzanine</b>								
<i>North Mezzanine</i>								
Standard Fare Gate		4	4	---	50	200		5.3.8.4
ADA Fare Gate		1	1	---	50	50		5.3.8.4
Emergency Exit Gate		1	1	---	60	60		5.3.7.1(1), Table C.1.3, Table C.1.4
				Width: ---		310	Fare Barrier Exit Capacity	
<i>South Mezzanine</i>								
Standard Fare Gate		4	4	---	50	200		5.3.8.4
ADA Fare Gate		1	1	---	50	50		5.3.8.4
Emergency Exit Gate		1	1	---	60	60		5.3.7.1(1), Table C.1.3, Table C.1.4
				Width: ---		310	Fare Barrier Exit Capacity	

**TEST NUMBER 1:** Evacuate platform occupant load from the platform in 4 minutes or less.

5.3.3.1

**F<sub>p</sub> (time to clear platform, in minutes) = Platform Occupant Load (people) / Platform Exit Capacity (people/minute)**

Platform Occupant Load	1,808	people
Platform Exit Capacity	237	people/minute
Time to Clear Platform (F <sub>p</sub> )	7.63	minutes

C.1.3a

	feet/minute	Time to exit, minutes		
Longest Travel Distance on platform to stairs toward North Mezzanine	248	124	2.00	Queuing time is greater than travel time. Queuing time governs. Longest travel distance shall be less than 325 feet for a new station.
Longest Travel Distance on platform to escalators toward South Mezzanine	248	124	2.00	Queuing time is greater than travel time. Queuing time governs. Longest travel distance shall be less than 325 feet for a new station.

5.3.3.4, 5.3.4.4

5.3.3.4, 5.3.4.4

**Test 1 Time** 7.63 minutes



**TEST NUMBER 2:** Evacuate platform occupant load from the most remote point on the platform to a point of safety in 6 minutes or less.

5.3.3.2

The area immediately outside each entrance structure is assumed to be the point of safety.

**Total Exit Time = T + W<sub>p</sub> + W<sub>f</sub>**

**Where: T = Total travel time**

**W<sub>p</sub> = Wait time at platform exits**

**W<sub>f</sub> = Wait time at subsequent egress element (e.g., fare barriers)**

**North Mezzanine**

**T = T<sub>1n</sub> + T<sub>2n</sub> + T<sub>3n</sub> + T<sub>4n</sub>**

- On Platform
- Platform Level to Concourse Level
- On Concourse to Faregates
- On Concourse from Faregates to Open Air
- Total Travel Time

	feet	fpm	minutes
T <sub>1n</sub>	248	124	2.00
T <sub>2n</sub>	15	48	0.31
T <sub>3n</sub>	115	200	0.58
T <sub>4n</sub>	38	200	0.19
T <sub>n</sub>			3.08

Vertical distance of vertical circulation element

5.3.4.4  
5.3.5.3(2)  
5.3.4.5  
5.3.4.5

**Waiting Time at Platform Exits = Platform Exit Flow Time - Platform Walk Time**

**W<sub>pn</sub> = F<sub>pn</sub> - T<sub>1n</sub>**

- F<sub>pn</sub>
- T<sub>1n</sub>
- W<sub>pn</sub>

F <sub>pn</sub>	7.63	minutes
T <sub>1n</sub>	2.00	minutes
W <sub>pn</sub>	5.63	minutes

**Waiting Time at Fare Gates = Fare Barrier Flow Time - Platform Exit Flow Time**

**W<sub>f</sub> = F<sub>fb</sub> - F<sub>p</sub> if F<sub>fb</sub> > F<sub>p</sub>; W<sub>f</sub> = 0 otherwise**

- Concourse Occupant Load
- Fare Barrier Exit Capacity
- Fare Barrier Flow Time F<sub>fbn</sub>
- F<sub>pn</sub>
- W<sub>fbn</sub>

Concourse Occupant Load	1292	people	= 169 people/minute (capacity of stairs to north mezzanine) x 7.63 minutes (time to clear platform)
Fare Barrier Exit Capacity	310	people/minute	
Fare Barrier Flow Time F <sub>fbn</sub>	4.17	minutes	
F <sub>pn</sub>	7.63	minutes	
W <sub>fbn</sub>	0.00	minutes	

C.1.3b

**Total Exit Time = Total Travel Time + Waiting Time at Platform Exits + Waiting Time at Fare Gates**

**Total Exit Time = T + W<sub>p</sub> + W<sub>fb</sub>**

- T<sub>n</sub>
- W<sub>pn</sub>
- W<sub>fbn</sub>

T <sub>n</sub>	3.08	
W <sub>pn</sub>	5.63	
W <sub>fbn</sub>	0.00	
<b>Total Exit Time North Mezzanine</b>	<b>8.71</b>	minutes

**South Mezzanine**

**T = T<sub>1s</sub> + T<sub>2s</sub> + T<sub>3s</sub> + T<sub>4s</sub>**

- On Platform
- Platform Level to Concourse Level
- On Concourse to Faregates
- On Concourse from Faregates to Open Air
- Total Travel Time

	feet	fpm	minutes
T <sub>1s</sub>	248	124	2.00
T <sub>2s</sub>	16	48	0.33
T <sub>3s</sub>	39	200	0.20
T <sub>4s</sub>	37	200	0.19
T <sub>s</sub>			2.71

Vertical distance of vertical circulation element

5.3.5.3(2)  
5.3.5.3  
5.3.4.5  
5.3.4.5

**Waiting Time at Platform Exits = Platform Exit Flow Time - Platform Walk Time**

**W<sub>p</sub> = F<sub>p</sub> - T<sub>1s</sub>**

- F<sub>ps</sub>

F <sub>ps</sub>	7.63	minutes
-----------------	------	---------

$T_{1s}$	2.00	minutes
$W_{ps}$	5.63	minutes

**Waiting Time at Fare Gates = Fare Barrier Flow Time - Platform Exit Flow Time**

$W_f = F_{fb} - F_p$  if  $F_{fb} > F_p$ ;  $W_f = 0$  otherwise

Concourse Occupant Load	517	people	= 68 people/minute (capacity of stairs to north mezzanine) x 7.63 minutes (time to clear platform)
Fare Barrier Exit Capacity	310	people/minute	
Fare Barrier Flow Time $F_{fbs}$	1.67	minutes	
$F_{ps}$	7.63	minutes	
$W_{fbs}$	0.00	minutes	

C.1.3b

**Total Exit Time = Total Travel Time + Waiting Time at Platform Exits + Waiting Time at Fare Gates + Waiting Time at Concourse Exits**

$Total\ Exit\ Time = T + W_p + W_{fb}$

$T_s$	2.71	
$W_{ps}$	5.63	
$W_{fbs}$	0.00	

**Total Exit Time South Mezzanine** 8.35 minutes

**Total Exit Time** 8.71 minutes

**Longest Common Path of Travel from Platform End**

104 feet

Common path of travel shall not exceed 82 feet for a new WMATA station.

5.3.3.5

Group	Period	Routes	Stops	Description							
Stop	Length	TTime	Alight	Board	Riders	Runs	LoadFac	Capacity	CapFac	StopName	
<b>1 8:00..9:00 3 27 Red Line Eastbound</b>											
1	13722	257.25	0	8839	8839	16	552.4	114	77.5	Shady Grove -- EB	
2	11260	204.75	156	3166	11849	16	740.6	114	103.9	Rockville -- EB	
3	5678	121.5	305	1597	13141	16	821.3	114	115.3	Twinbrook -- EB	
4	7222	144.75	570	1999	14570	16	910.6	114	127.8	White Flint -- EB	
5	11091	180	61	3171	17680	16	1105	114	155.1	Grosvenor-Strathmore -- EB	
6	5764	180	805	1205	18080	16	1130	114	158.6	Medical Center -- EB	
7	9485	180	1494	3043	19629	16	1226.8	114	172.2	Bethesda -- EB	
8	4167	120	668	2539	21500	16	1343.8	114	188.6	Friendship Heights -- EB	
9	5734	180	570	1862	22792	16	1424.5	114	199.9	Tenleytown-AU -- EB	
10	2886	120	259	1773	24306	16	1519.1	114	213.2	Van Ness-UDC -- EB	
11	4227	120	72	1400	25634	16	1602.1	114	224.9	Cleveland Park -- EB	
12	6025	120	209	2054	27479	16	1717.4	114	241	Woodley Park -- EB	
13	2972	180	3697	2624	26406	16	1650.4	114	231.6	Dupont Circle -- EB	
14	4141	180	6800	568	20174	16	1260.9	114	177	Farragut North -- EB	
15	1768	120	10278	7032	16928	16	1058	114	148.5	Metro Center -- EB	
16	1786	120	5881	5168	16215	16	1013.4	114	142.2	Gallery Place -- EB	
17	3435	120	3352	57	12920	16	807.5	114	113.3	Judiciary Square -- EB	
18	3615	120	7106	838	6652	16	415.8	114	58.4	Union Station -- EB	
19	5497	120	4150	233	2735	16	170.9	114	24	NoMa-Gallaudet U -- EB	
20	4522	180	531	285	2489	16	155.6	114	21.8	Rhode Island Ave -- EB	
21	7062	180	596	200	2093	16	130.8	114	18.4	Brookland-CUA -- EB	
22	10010	180	485	1087	2695	16	168.4	114	23.6	Fort Totten -- EB	
23	7732	180	482	144	2357	16	147.3	114	20.7	Takoma -- EB	
24	8715	90	2045	118	430	9	47.8	66	6.5	Silver Spring -- EB	
25	8667	180	127	14	317	9	35.2	66	4.8	Forest Glen -- EB	
26	9184	180	246	5	76	9	8.4	66	1.2	Wheaton -- EB	
27	0	0	76	0	0	0	0	0	0	Glenmont -- EB	
<b>1 17:00..18:00 2 27 Red Line Eastbound</b>											
1	13722	251.5	0	639	639	14	45.6	102	6.3	Shady Grove -- EB	
2	11260	196.5	50	547	1136	14	81.1	102	11.1	Rockville -- EB	
3	5678	141	103	592	1625	14	116.1	102	15.9	Twinbrook -- EB	
4	7222	156.5	133	1121	2613	14	186.6	102	25.6	White Flint -- EB	
5	11091	180	115	297	2795	14	199.6	102	27.4	Grosvenor-Strathmore -- EB	
6	5764	180	43	1414	4166	14	297.6	102	40.8	Medical Center -- EB	
7	9485	180	630	2616	6152	14	439.4	102	60.3	Bethesda -- EB	
8	4167	120	541	1274	6885	14	491.8	102	67.5	Friendship Heights -- EB	
9	5734	180	480	913	7318	14	522.7	102	71.7	Tenleytown-AU -- EB	
10	2886	120	278	703	7743	14	553.1	102	75.9	Van Ness-UDC -- EB	
11	4227	120	292	197	7648	14	546.3	102	75	Cleveland Park -- EB	
12	6025	120	405	601	7844	14	560.3	102	76.9	Woodley Park -- EB	
13	2972	180	750	4589	11683	14	834.5	102	114.5	Dupont Circle -- EB	
14	4141	180	526	5973	17130	14	1223.6	102	167.9	Farragut North -- EB	
15	1768	120	3970	12222	25382	14	1813	102	248.8	Metro Center -- EB	
16	1786	120	6800	5585	24167	14	1726.2	102	236.9	Gallery Place -- EB	
17	3435	120	187	1283	25263	14	1804.5	102	247.7	Judiciary Square -- EB	
18	3615	120	6397	2829	21695	14	1549.6	102	212.7	Union Station -- EB	
19	5497	120	1957	1675	21413	14	1529.5	102	209.9	NoMa-Gallaudet U -- EB	
20	4522	180	2293	247	19367	14	1383.4	102	189.9	Rhode Island Ave -- EB	
21	7062	180	1064	280	18583	14	1327.4	102	182.2	Brookland-CUA -- EB	
22	10010	180	3318	1005	16270	14	1162.1	102	159.5	Fort Totten -- EB	
23	7732	180	1936	144	14478	14	1034.1	102	141.9	Takoma -- EB	
24	8715	90	7934	441	6985	7	997.9	52	134.3	Silver Spring -- EB	
25	8667	180	1448	18	5555	7	793.6	52	106.8	Forest Glen -- EB	
26	9184	180	2634	25	2946	7	420.9	52	56.7	Wheaton -- EB	
27	0	0	2946	0	0	0	0	0	0	Glenmont -- EB	

Group	Period	Routes	Stops	Description							
Stop	Length	TTime	Alight	Board	Riders	Runs	LoadFac	Capacity	CapFac	StopName	
<b>2 8:00..9:00 2 27 Red Line Westbound</b>											
28	9184	180	0	3286	3286	7	469.4	50	65.7	Glenmont -- WB	
29	8667	180	24	2758	6020	7	860	50	120.4	Wheaton -- WB	
30	8715	180	25	1667	7662	7	1094.6	50	153.2	Forest Glen -- WB	
31	7732	180	488	7915	15089	14	1077.8	92	164	Silver Spring -- WB	
32	10010	180	149	1982	16922	14	1208.7	92	183.9	Takoma -- WB	
33	7062	180	1128	3225	19019	14	1358.5	92	206.7	Fort Totten -- WB	
34	4522	180	388	1226	19857	14	1418.4	92	215.8	Brookland-CUA -- WB	
35	5497	120	281	2262	21838	14	1559.9	92	237.4	Rhode Island Ave -- WB	
36	3615	120	1808	2198	22228	14	1587.7	92	241.6	NoMa-Gallaudet U -- WB	
37	3435	120	3144	6929	26013	14	1858.1	92	282.8	Union Station -- WB	
38	1786	120	1507	175	24681	14	1762.9	92	268.3	Judiciary Square -- WB	
39	1768	120	4923	6357	26115	14	1865.4	92	283.9	Gallery Place -- WB	
40	4141	180	12752	3443	16806	14	1200.4	92	182.7	Metro Center -- WB	
41	2972	180	6108	377	11075	14	791.1	92	120.4	Farragut North -- WB	
42	6025	120	4463	743	7355	14	525.4	92	79.9	Dupont Circle -- WB	
43	4227	120	473	530	7412	14	529.4	92	80.6	Woodley Park -- WB	
44	2886	120	176	377	7613	14	543.8	92	82.8	Cleveland Park -- WB	
45	5734	180	772	399	7240	14	517.1	92	78.7	Van Ness-UDC -- WB	
46	4167	120	1088	605	6757	14	482.6	92	73.4	Tenleytown-AU -- WB	
47	9485	180	1260	663	6160	14	440	92	67	Friendship Heights -- WB	
48	5764	180	3127	692	3725	14	266.1	92	40.5	Bethesda -- WB	
49	11091	180	1372	60	2413	14	172.4	92	26.2	Medical Center -- WB	
50	7222	90	212	127	2328	7	332.6	50	46.6	Grosvenor-Strathmore -- WB	
51	5678	180	988	137	1477	7	211	50	29.5	White Flint -- WB	
52	11260	180	593	124	1008	7	144	50	20.2	Twinbrook -- WB	
53	13722	240	504	47	551	7	78.7	50	11	Rockville -- WB	
54	0	0	551	0	0	0	0	0	0	Shady Grove -- WB	
<b>2 17:00..18:00 2 27 Red Line Westbound</b>											
28	9184	180	0	173	173	8	21.6	58	3	Glenmont -- WB	
29	8667	180	8	315	480	8	60	58	8.3	Wheaton -- WB	
30	8715	180	9	218	689	8	86.1	58	11.9	Forest Glen -- WB	
31	7732	180	138	2069	2620	15	174.7	104	25.2	Silver Spring -- WB	
32	10010	180	149	423	2894	15	192.9	104	27.8	Takoma -- WB	
33	7062	180	934	498	2458	15	163.9	104	23.6	Fort Totten -- WB	
34	4522	180	147	614	2925	15	195	104	28.1	Brookland-CUA -- WB	
35	5497	120	253	532	3204	15	213.6	104	30.8	Rhode Island Ave -- WB	
36	3615	120	183	4102	7123	15	474.9	104	68.5	NoMa-Gallaudet U -- WB	
37	3435	120	824	6368	12667	15	844.5	104	121.8	Union Station -- WB	
38	1786	120	70	2825	15422	15	1028.1	104	148.3	Judiciary Square -- WB	
39	1768	120	4614	5779	16587	15	1105.8	104	159.5	Gallery Place -- WB	
40	4141	180	6612	9707	19682	15	1312.1	104	189.3	Metro Center -- WB	
41	2972	180	775	5745	24652	15	1643.5	104	237	Farragut North -- WB	
42	6025	120	2682	3166	25136	15	1675.7	104	241.7	Dupont Circle -- WB	
43	4227	120	1651	179	23664	15	1577.6	104	227.5	Woodley Park -- WB	
44	2886	120	1133	75	22606	15	1507.1	104	217.4	Cleveland Park -- WB	
45	5734	180	1487	233	21352	15	1423.5	104	205.3	Van Ness-UDC -- WB	
46	4167	120	1734	464	20082	15	1338.8	104	193.1	Tenleytown-AU -- WB	
47	9485	180	2246	571	18407	15	1227.1	104	177	Friendship Heights -- WB	
48	5764	180	2770	1359	16996	15	1133.1	104	163.4	Bethesda -- WB	
49	11091	180	1030	697	16663	15	1110.9	104	160.2	Medical Center -- WB	
50	7222	90	2714	40	13989	8	1748.6	58	241.2	Grosvenor-Strathmore -- WB	
51	5678	180	1425	487	13051	8	1631.4	58	225	White Flint -- WB	
52	11260	180	1514	229	11766	8	1470.8	58	202.9	Twinbrook -- WB	
53	13722	240	3103	130	8793	8	1099.1	58	151.6	Rockville -- WB	
54	0	0	8793	0	0	0	0	0	0	Shady Grove -- WB	

# Definitions

## Link Load / Leave Load

Train load traveling into the station from the adjacent station.

## Entraining Loads

Number of people entering a station to board trains in each direction.

## Headway

Time between trains (for each direction).

## Surge Factor

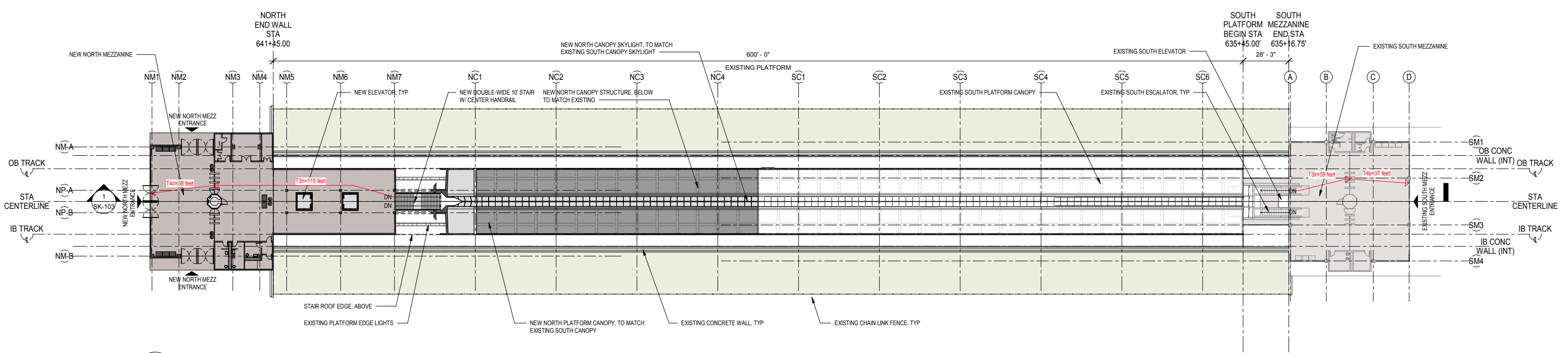
A multiplier to account for the peak 15 minutes in train and platform occupancy during the peak hour -- the peak within the peak hour. A surge factor of 1.3 is typical based on data from transit systems observed from 1972-1981. Surge factors have been reported between 1.15 and 2.75.

## Missed Headway Interval

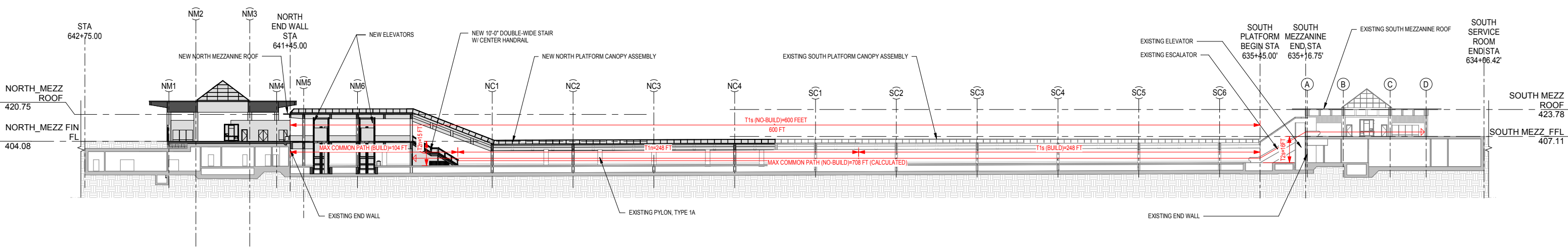
To account for delayed service in the peak direction. This allows a greater entraining load to accumulate in the station, and for a larger train load on the train(s) entering the station.

# Part 2: Egress Diagrams

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3 OVERALL MEZZANINE PLAN - EGRESS DIAGRAM  
 SK-LS01 SCALE: 1" = 30'-0"



2 OVERALL LONGITUDINAL SECTION - EGRESS DIAGRAM  
 SK-LS01 SCALE: 1" = 30'-0"

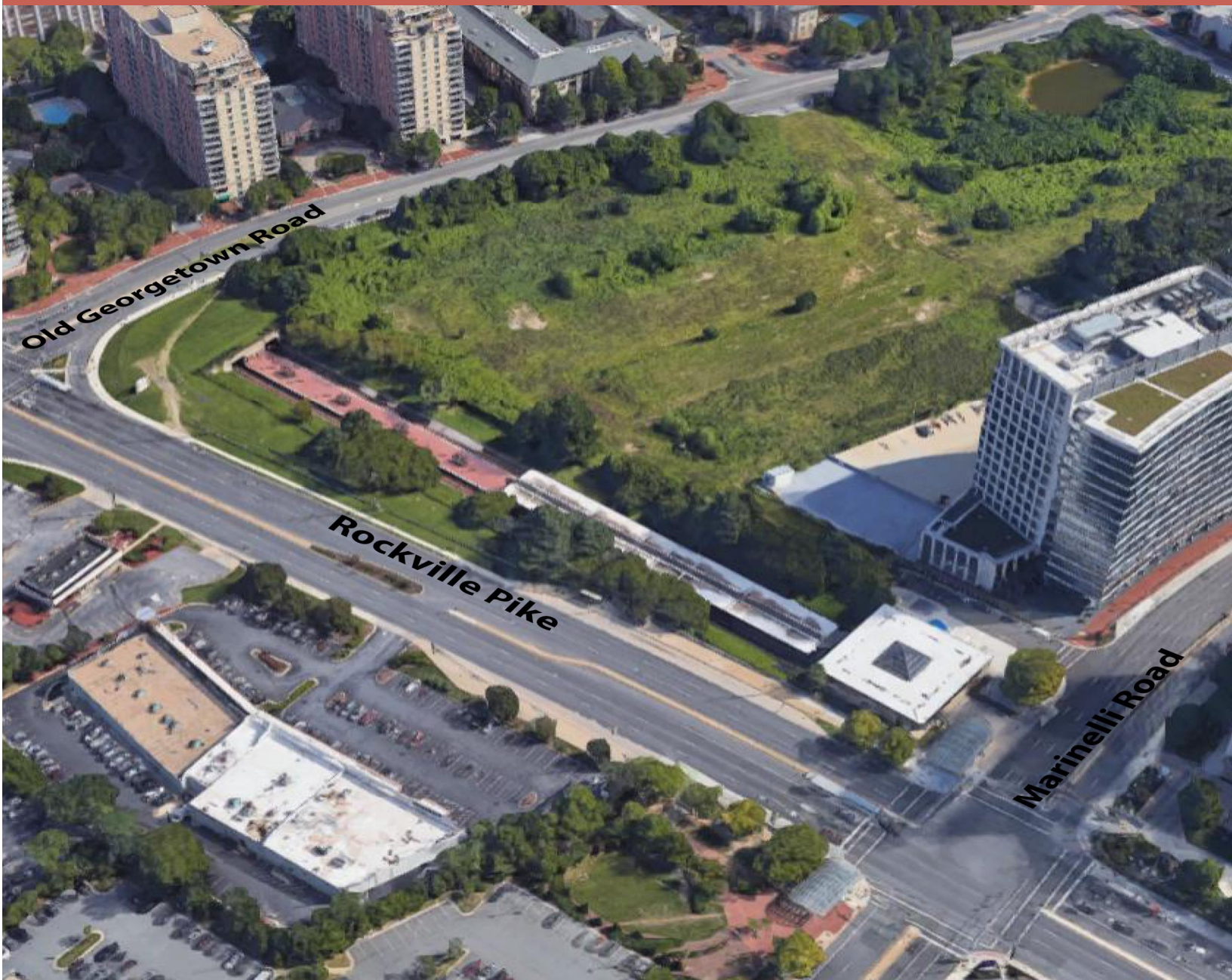
LEGEND:

- |  |                        |  |                            |
|--|------------------------|--|----------------------------|
|  | EXISTING BUILDING      |  | NEW NORTH MEZZANINE GRID   |
|  | NEW CONSTRUCTION       |  | NEW NORTH PLATFORM GRID    |
|  | EXISTING SOFTLANDSCAPE |  | NEW NORTH CANOPY GRID      |
|  | PATH OF EXIT           |  | SOUTH EXISTING CANOPY GRID |



# WHITE FLINT METRORAIL STATION NORTH ENTRANCE FEASIBILITY STUDY Technical Memorandum Demand Assessment

Montgomery County, Maryland  
November 2019



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## 1.0 Introduction

This technical memorandum reports the 2040 ridership demand forecast results for the White Flint Metrorail Station North Entrance Feasibility Study (“the study”) conducted by the Washington Metropolitan Area Transit Authority (WMATA or “Metro”) and evaluates the corners of the Rockville Pike and Old Georgetown Road intersection for ridership demand.

## 2.0 Background

Metro produces annual Integrated Metrorail Ridership Forecasts (“Integrated Forecasts”) in a spreadsheet that combines the results from a short-term (direct-ridership) model and a long-term forecast (National Capital Region Transportation Planning Board (NC-TPB) / Metropolitan Washington Council of Governments (MWCOC)’s regional travel forecasting) model to provide a range of station-level boardings. This range has a lower-bound and an upper-bound. According to its documentation the lower bound represents the continuation of the trend wherein the challenges to the Metro brand, volatility in the mobility space, and, increasing telework, continue as they have been. On the other hand, the upper bound represents an assumption that the trend is saturated – that is, the Metro brand and public opinion is getting better, the mobility options are maxed out and we’ve reached peak-Uber, and that those who can telework already do. This spreadsheet forms a key input to the Line Load application, a dynamic Metrorail train loading estimation tool. It may note that the 2018 version of the Integrated Forecasts included observed boardings by station for 2017 and forecasted boardings by station for 2019 to 2040. The forecasts for 2019 to 2023 were based on the short-term methodology, and the forecasts for 2024 to 2040 were based on long-term methodology that essentially applied a compounded annual growth rate derived from the ridership forecasts in the NC-TPB/MWCOG model.

## 3.0 Methodology

At the request of Metro, the ridership demand forecasting under this study was performed using available data instead of running any travel models. The key input to the forecast was the *2018 Integrated Metrorail Ridership Forecast* spreadsheet, which was provided by Metro. Table 1 shows the observed data and data extracted from the 2018 Integrated Forecasts. The forecast for 2040, which is based on the long-term methodology as mentioned earlier, in the 2018 Integrated Forecasts is based on Version 2.3.70 of the NC-TPB/MWCOG model and which in turn is based on the MWCOG Round 9.0 Cooperative Land Use Forecast (“Land Use Round 9.0”). Since the release of the 2018 Integrated Metrorail Ridership Forecast, a newer version of the regional co-operative land use forecast (“Land Use Round 9.1”) has become available. Another data source used in this analysis was the Line Load application that was built on the 2017 Integrated Forecasts, with the base year for the analysis as 2017 and the forecast year as 2040.

Table 1 | Forecasted Station-Level Daily Boardings

	Daily Boardings		
	Lower Bound	Upper Bound	Average
2017: Existing			
2017 (Mezzanine Data*)	3,504		3,504
2017 (Actuals** from Integrated Forecasts)	3,788	3,798	3,793
2040: Without New Entrance			
2040 No-Build (Integrated Forecasts)	5,725	7,754	6,739

Note: \* corresponding to average weekday from July to August 2017  
 \*\* corresponding to average weekday from May to July 2017

To provide a more comprehensive evaluation of the ridership forecast at the White Flint station, two different methods were developed and applied to estimate the boardings with the new entrance (or build conditions):

- Method I: Land Use Activity
- Method II: Development Parcels

These methods and results from each approach are presented in the following sections.

### 3.1 Method 1: Land Use Activity

This method was repeated with the Land Use Round 9.1 as well as Land Use Round 9.0 to generate two sets of data points.

In this method, the ridership for the build condition (with the new entrance) is computed by applying a growth percentage to the no-build ridership. The computation of the growth percentage involves a GIS exercise, described in more detail in Chapter 5.0., wherein half-mile walkshed buffers are prepared for the existing and new station entrances of White Flint Station, as well as the entrance for Twinbrook Station to take their overlap into consideration. These walkshed buffers without the new entrance at White Flint Station, and with the new entrance at White Flint Station are shown in Figure 4 and Figure 5 respectively. The shaded area (a sliver) shown in Figure 5 is assumed to be the catchment area for the new entrance at White Flint Station. The land use corresponding to the area of this sliver is used to derive the growth percentage. This approach involves assumptions that the land use is uniformly distributed with Traffic Analysis Zone (TAZ)s, and that the user-preferences are also uniformly distributed within a TAZ.

Since population is associated with trip generation and employment, the land use information is converted into activity. Activities for each TAZ is calculated based on the household and group quarter population and total employment as;

$$\text{Activity} = \text{household population} + 0.5 * \text{group quarter population} + 2.4 * \text{total employment}$$

The activities are then converted into activity indices by factoring the area of half-mile walkshed intersecting with TAZ shapefile and current Metrorail mode share of the TAZ. The activity indices are then summed across all the applicable TAZs within the half-mile walksheds for each entrance to compute the growth percentage as shown below.

$$\text{Growth percentage} = \frac{\text{Activity Index for Catchment of New Entrance}}{\text{Activity Index for Catchment of Existing Entrance}}$$

This growth percentage is then applied to the no-build ridership to derive the build ridership or ridership with the new entrance constructed. To further determine the splits between the existing entrance and the new entrance the production and attraction mode shares are considered to determine boarding and alighting split factors between the two entrances. This method was repeated with the Land Use Round 9.1 as well as Land Use Round 9.0 to generate two sets of data points.

### 3.2 Method 2: Development Parcels

This method was repeated with the Land Use Round 9.1 as well as Land Use Round 9.0 to generate two sets of data points.

Method 2 is similar to Method 1 in the aspect that growth percentages are used to determine the build ridership, however, it is more involved. In Method 2, the parcel data information, referenced in Chapter 5.0, are utilized in conjunction with the ridership estimation spreadsheet tool (based on the 2005 Development Survey). The distribution of the parcels from the station entrances was computed using GIS and was adjusted based on the growth in 2017 and 2040 land use. Further, the parcels associated with the catchment (sliver in GIS) corresponding to the new entrance were used to determine the growth percentage in ridership. This growth percentage was then applied to the no-build ridership to determine the build ridership or ridership with the second entrance. A process similar to that in Method 1 was used to further obtain the split factors between the two entrances. This method was repeated with both the Land Use Round 9.1 and Land Use Round 9.0.

## 4.0 Ridership Forecasts

Table 2 presents station-level daily boardings for the White Flint station from various sources. The observed data are shown with a single value, while the forecasts are presented ranging from a lower bound to upper bound.

The Method 1 application with Land Use Round 9.1 represented a growth of about 7.4 percent increase in daily boardings, and about 6.8 percent increase in daily boardings with Land Use Round 9.0.

The application of Method 2 with Land use Round 9.1 represented a growth of about 11.5 percent increase in daily boardings, and about 2.8 percent increase in daily boardings with Land Use Round 9.0.

The splits between the existing (South) and new (North) entrances, for each of the methods are presented in subsequent tables: Table 3, Table 4, Table 5, and Table 6.

Table 2 | Forecasted Station-Level Daily Boardings

	Daily Boardings		
	Lower Bound	Upper Bound	Average
2017: Existing			
2017 (Mezzanine Data*)	3,504		3,504
2017 (Actuals** from Integrated Forecasts)	3,788	3,798	3,793
2040: Without New Entrance			
2040 No-Build (Integrated Forecasts)	5,725	7,754	6,739
2040: With New Entrance (Method 1: Land Use Activity)			
2040 Build (Growth using Land Use Round 9.1)	6,149	8,329	7,239
2040 Build (Growth using Land Use Round 9.0)	6,116	8,284	7,200
2040: With New Entrance (Method 2: Development Parcels)			
2040 Build (Growth using Land Use Round 9.1 & Parcels)	6,386	8,649	7,517
2040 Build (Growth using Land Use Round 9.0 & Parcels)	5,883	7,968	6,925
2040: Additional Daily Boardings			
Estimated Additional Daily Boardings from New Entrance	158	895	526

Note: \* corresponding to average weekday from July to August 2017  
 \*\* corresponding to average weekday from May to July 2017

Table 3 | Method 1 - Daily Boardings by Mezzanine using Land Use Round 9.1

Mezzanine / Daily Boardings	2017	2040 No-Build		2040 Build	
		Lower Bound	Upper Bound	Lower Bound	Upper Bound
Existing (South) Mezzanine	3,504	5,725	7,754	3,170	4,294
Second (North) Mezzanine	-	-	-	2,979	4,035
Total	3,504	5,725	7,754	6,149	8,329

Table 4 | Method 1 - Daily Boardings by Mezzanine using Land Use Round 9.0

Mezzanine / Daily Boardings	2017	2040 No-Build		2040 Build	
		Lower Bound	Upper Bound	Lower Bound	Upper Bound
Existing (South) Mezzanine	3,504	5,725	7,754	3,180	4,307
Second (North) Mezzanine	-	-	-	2,936	3,977
Total	3,504	5,725	7,754	6,116	8,284

Table 5 | Method 2 - Daily Boardings by Mezzanine using Land Use Round 9.1 & Parcels

Mezzanine / Daily Boardings	2017	2040 No-Build		2040 Build	
		Lower Bound	Upper Bound	Lower Bound	Upper Bound
Existing (South) Mezzanine	3,504	5,725	7,754	3,192	4,323
Second (North) Mezzanine	-	-	-	3,194	4,326
Total	3,504	5,725	7,754	6,386	8,649

Table 6 | Method 2 – Daily Boardings by Mezzanine using Land Use Round 9.0 & Parcels

Mezzanine / Daily Boardings	2017	2040 No-Build		2040 Build	
		Lower Bound	Upper Bound	Lower Bound	Upper Bound
Existing (South) Mezzanine	3,504	5,725	7,754	2,940	3,982
Second (North) Mezzanine	-	-	-	2,943	3,986
Total	3,504	5,725	7,754	5,883	7,968

## 5.0 GIS Analysis of New Entrance Riders

To determine the direction of approach for the riders using the new entrance, half-mile walkshed buffers were prepared in GIS and analyzed against the Transportation Analysis Zones (TAZ) based land use data from the NC-TPB travel demand model as shown in Figure 1, Figure 4, and Figure 5. These quarter-mile walksheds were also analyzed in conjunction with the White Flint Sector plans. After reviewing the 2010 and 2017 White Flint Sector Plans (Figure 2 and Figure 3), the density and building height near SE and NW corner of the Old Georgetown Road and Rockville Pike intersection is relatively high (recommended building heights range from 190 ft to 300 ft in the latest adopted master plan and FAR is near 4.0). Parcel data for Montgomery County was sourced from the website of Maryland Department of Planning and when overlaid with quarter-mile walkshed for all four potential locations of the new entrance, the overall square footage of buildings in commercial use and number of housing units are compared. Table 7 below shows the score of initial evaluation based on the existing land use data at TAZ and parcel level.

Figure 1 | Walkshed buffers

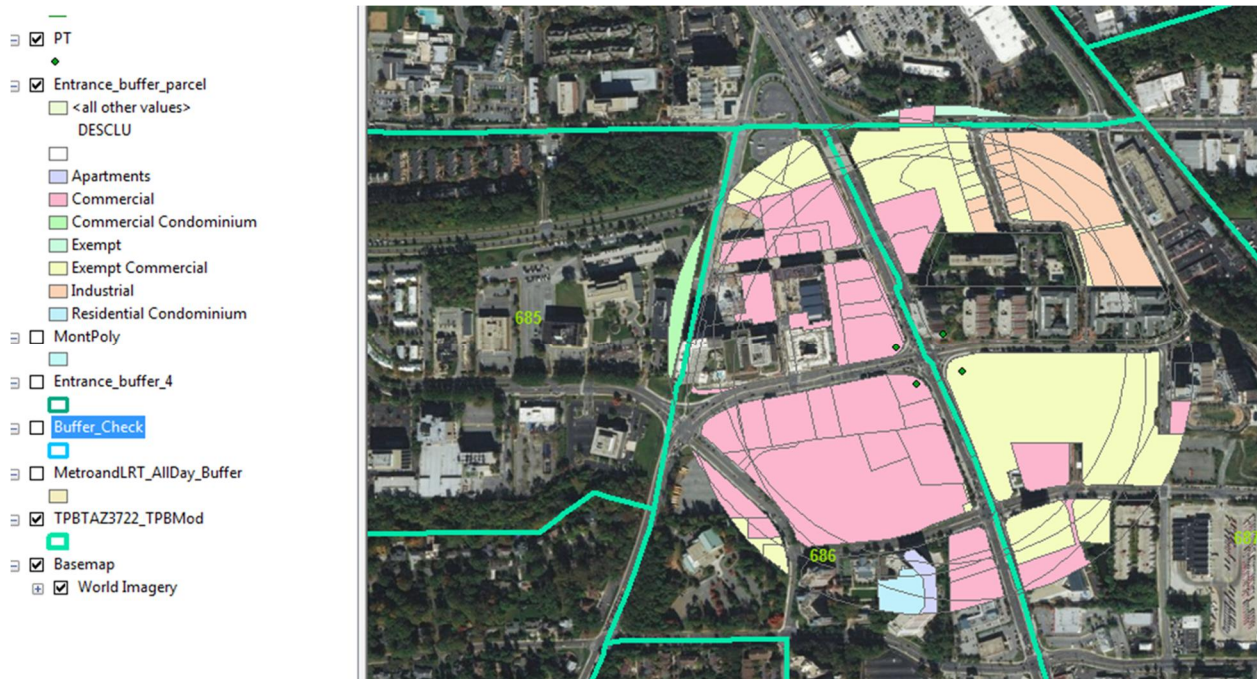




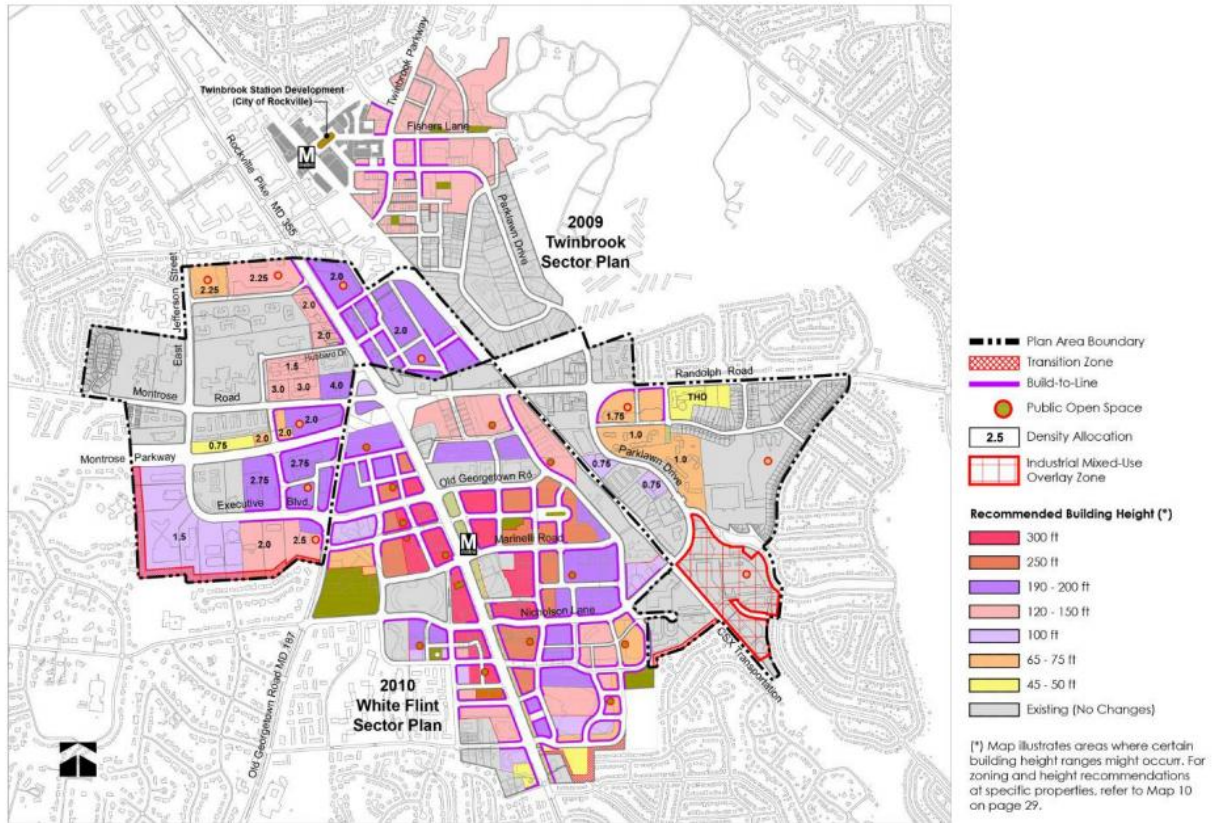
Table 7 | Activity Score for ¼ Mile Walkshed for Potential Location of Grade Separated Pedestrian Crossing

PM Peak Hour	Passenger Movement	Parcel-level Land Use	Percentage of the Total	Emp/HH Weights (Round 9.1)	Emp/HH Weights (Round 9.0)	Final Score (Round 9.1)	Final Score (Round 9.0)
SW Corner	Commercial and Industrial Building Structure (SQFT)	3,294,051	24.97%	84.49%	70.44%	0.250	0.250
	Apartment/Single-Family Building Units	547	25.01%	15.51%	29.56%		
SE Corner	Commercial and Industrial Building Structure (SQFT)	3,259,470	24.71%	80.35%	73.86%	0.248	0.248
	Apartment/Single-Family Building Units	547	25.01%	19.65%	26.14%		
NE Corner	Commercial and Industrial Building Structure (SQFT)	3,211,913	24.35%	80.35%	73.86%	0.245	0.245
	Apartment/Single-Family Building Units	546	25.01%	19.65%	26.14%		
NW Corner	Commercial and Industrial Building Structure (SQFT)	3,426,094	24.97%	84.49%	70.44%	0.258	0.257
	Apartment/Single-Family Building Units	547	25.01%	15.51%	29.56%		

Note: Department of Planning, Maryland. Digital Parcel Mapping Files. <https://planning.maryland.gov/Pages/OurProducts/DownloadFiles.aspx>. Accessed on 1/24/2018.

Figure 2 | White Flint Sector Plan

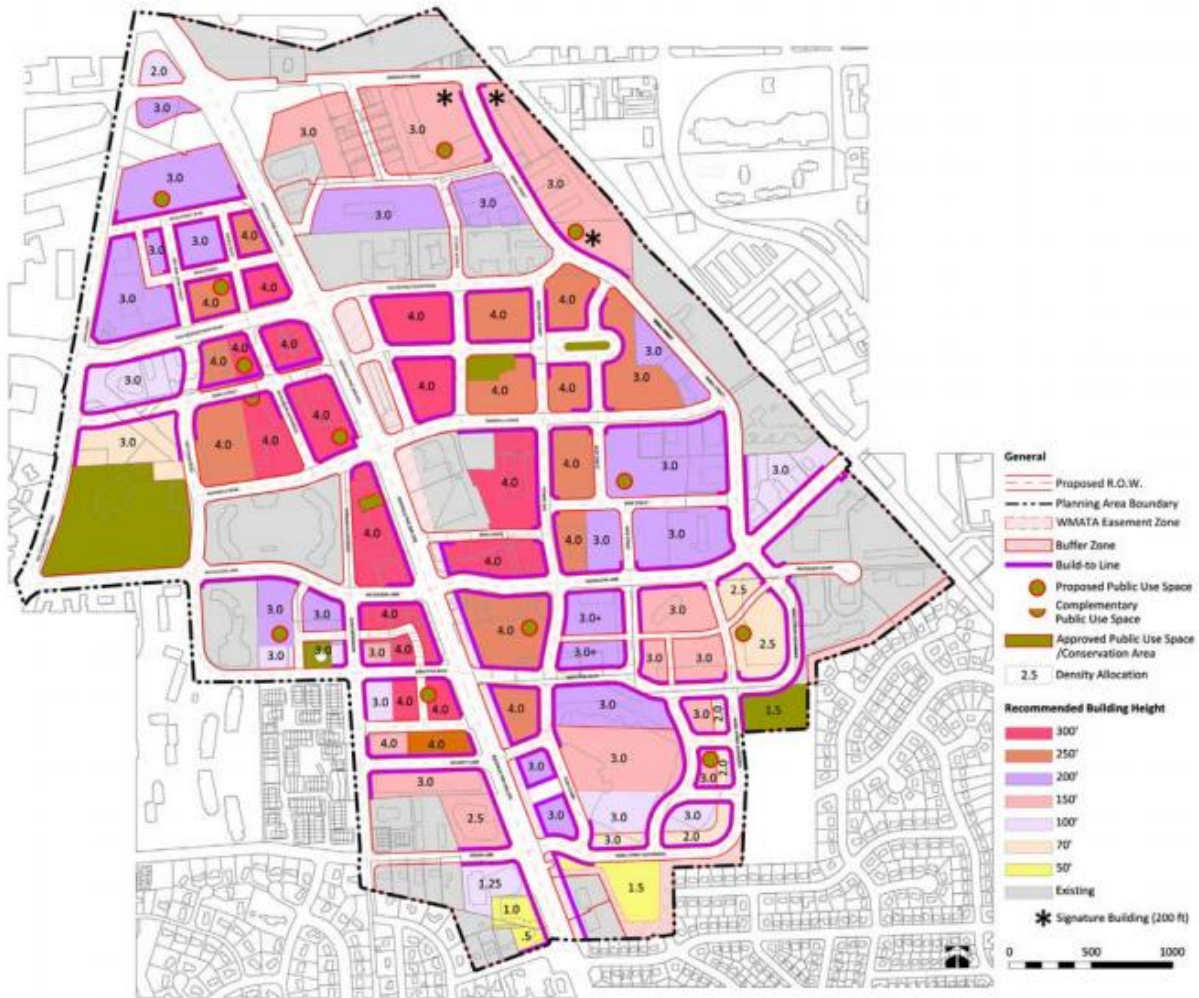
Map 11: Overall Height and Density Recommendations



Source: Montgomery County Planning Department. White Flint 2 Sector Plan. [http://montgomeryplanning.org/wp-content/uploads/2018/10/2018-White-Flint-2-Sector-Plan-Final-Documents\\_WEB-compressed.pdf](http://montgomeryplanning.org/wp-content/uploads/2018/10/2018-White-Flint-2-Sector-Plan-Final-Documents_WEB-compressed.pdf). 2018. Page 30.

Figure 3 | White Flint Sector Plan in Detail

Map 10: Density and Height



Source: Montgomery County Planning Department. White Flint Sector Plan.  
[http://www.montgomeryplanning.org/community/whiteflint/documents/WhiteFlintSectorPlanApprovedandAdopted\\_web.pdf](http://www.montgomeryplanning.org/community/whiteflint/documents/WhiteFlintSectorPlanApprovedandAdopted_web.pdf).  
2010. Page 22.

Figure 4 | White Flint Metrorail Station Location without New Entrance

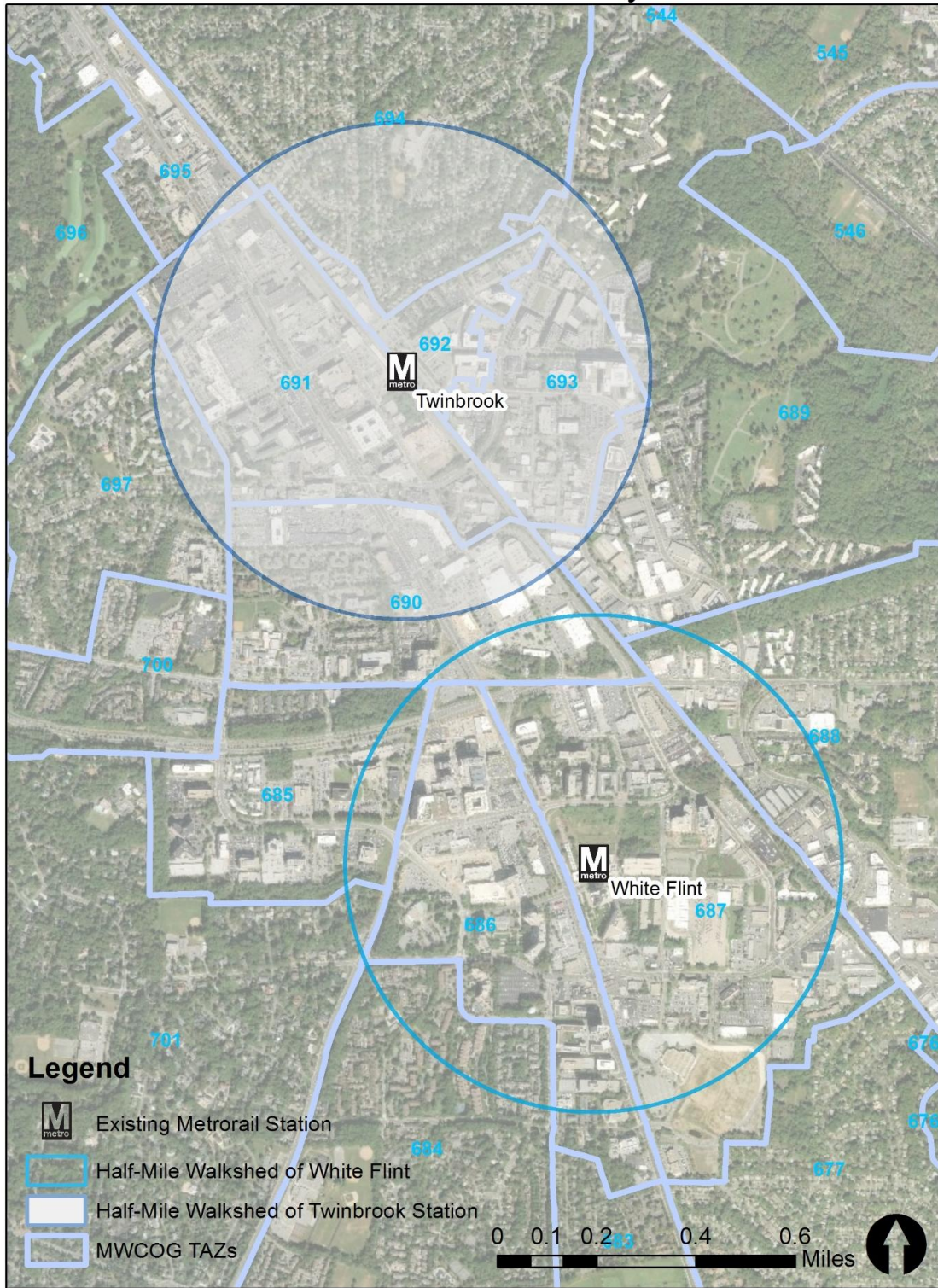
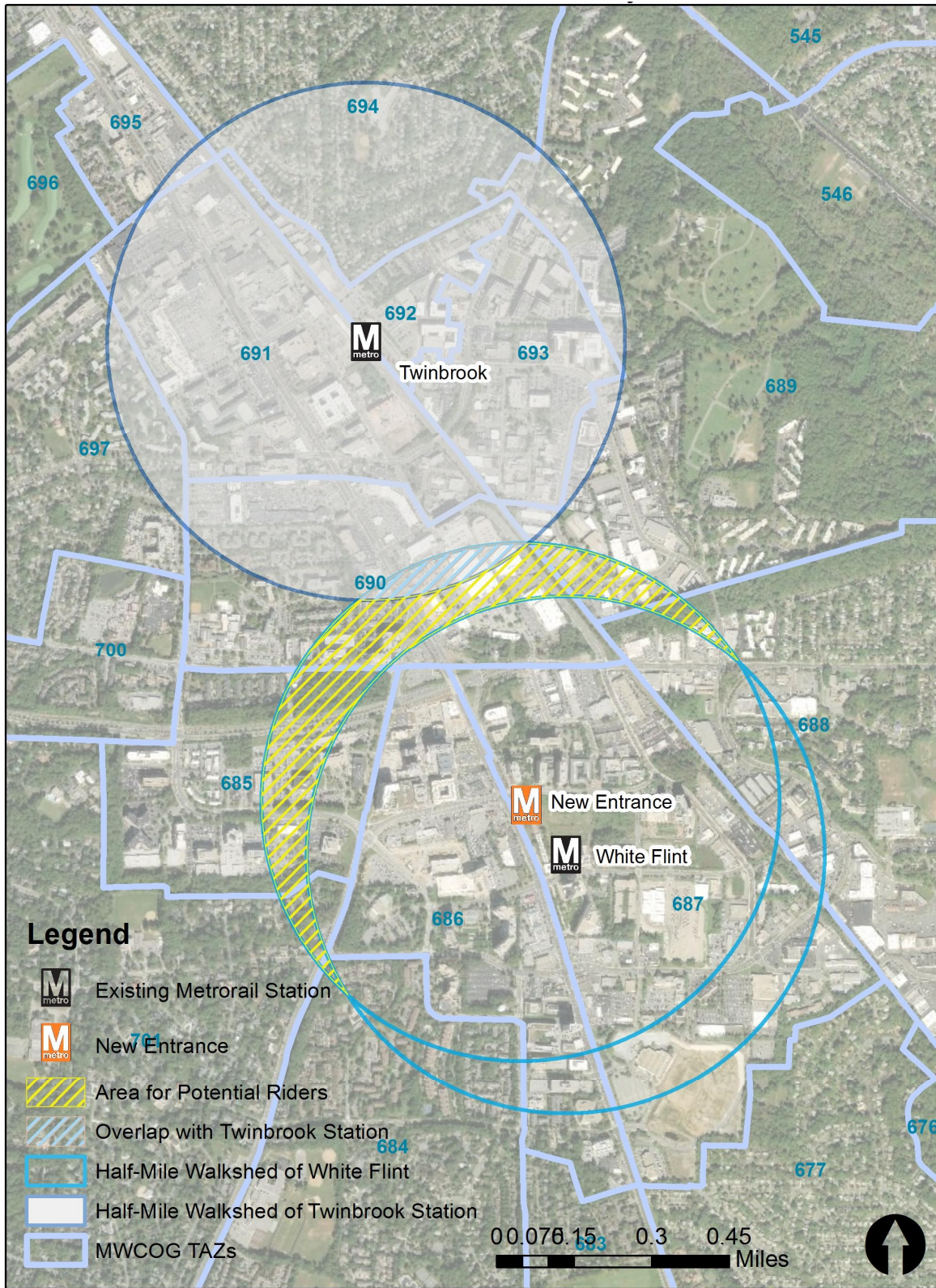


Figure 5 | White Flint Metrorail Station Walkshed with New Entrance



## 6.0 Summary

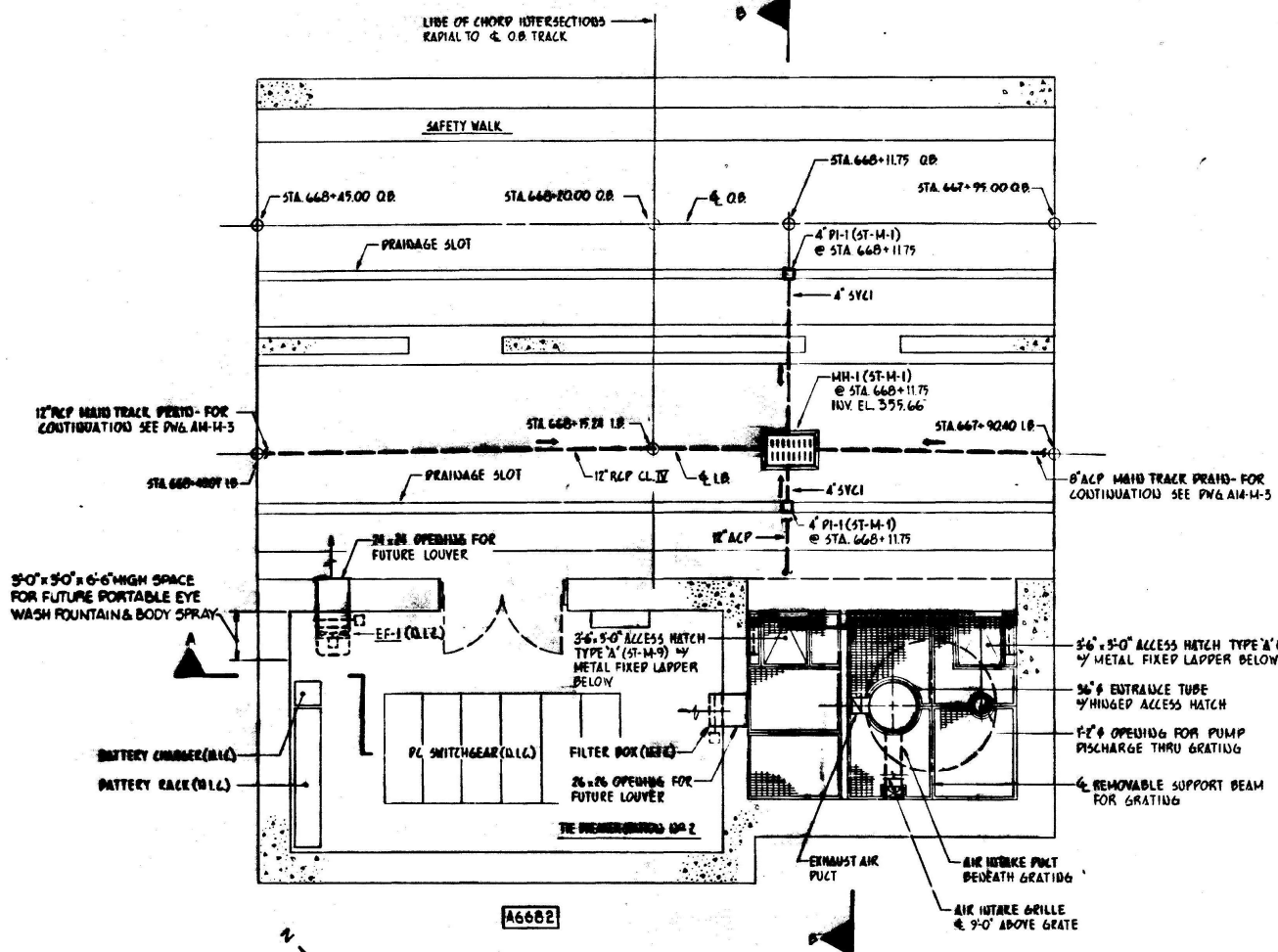
- The proposed north entrance would not result in many new riders entering the system, however it would result in many current riders entering the system through the new entrance which would relieve demand at existing entries.
- The NW corner of the Old Georgetown Road and Rockville Pike intersection is associated with the most pedestrian activity based on both existing parcel land use data (2013-2014) and approved future year master plan of White Flint.



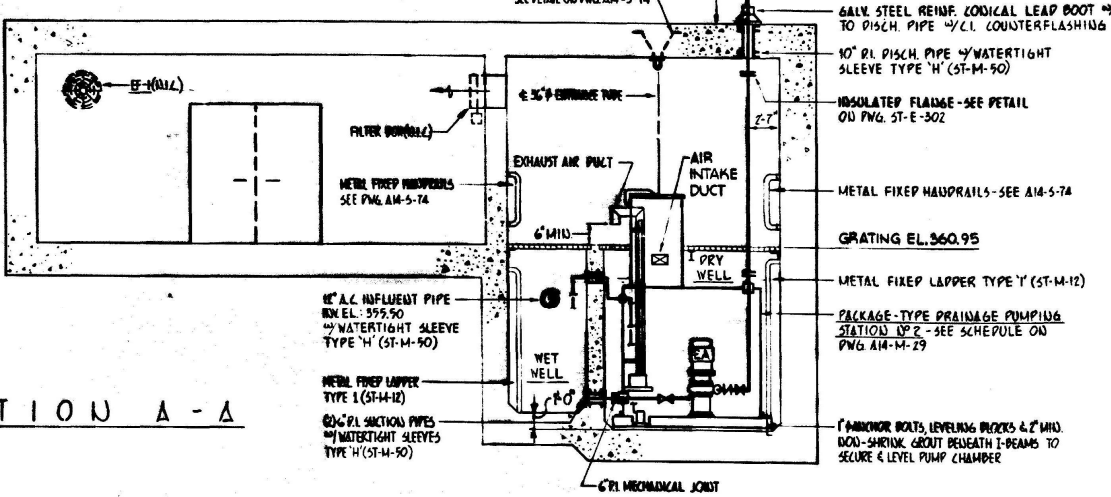
## Appendix D:

### Reference Documents

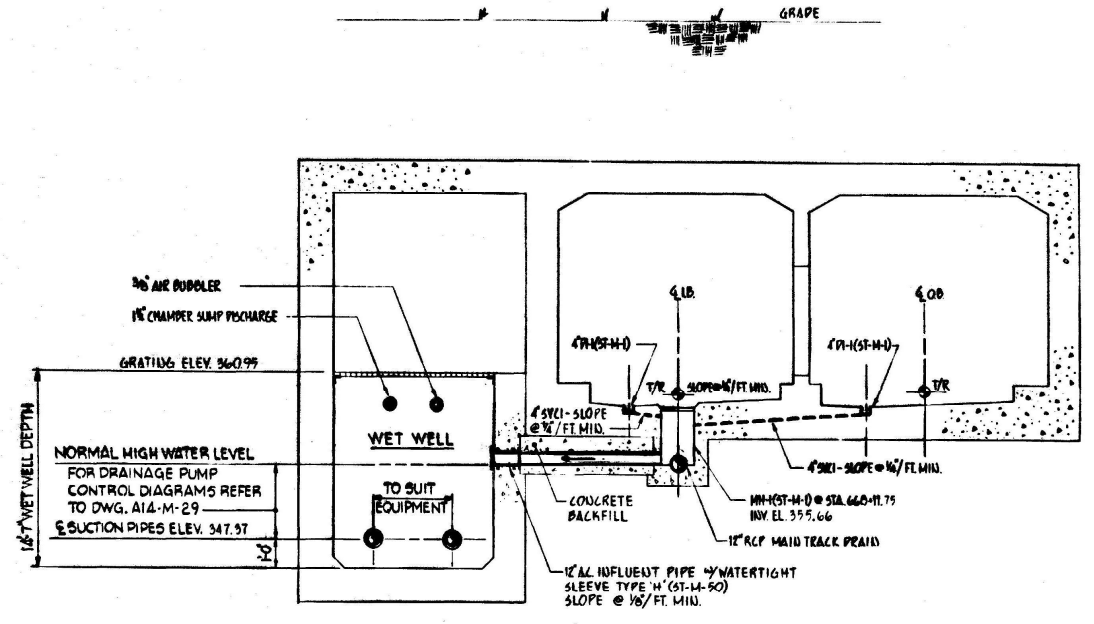
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- Auxiliary Power Load Calculations ..... D-16
- Risk Register ..... D-17
- Environmental Scan ..... D-18
  - Hazardous Materials Report ..... D-18
  - USFWS IPaC Report..... D-31
  - Historic Resources ..... D-41



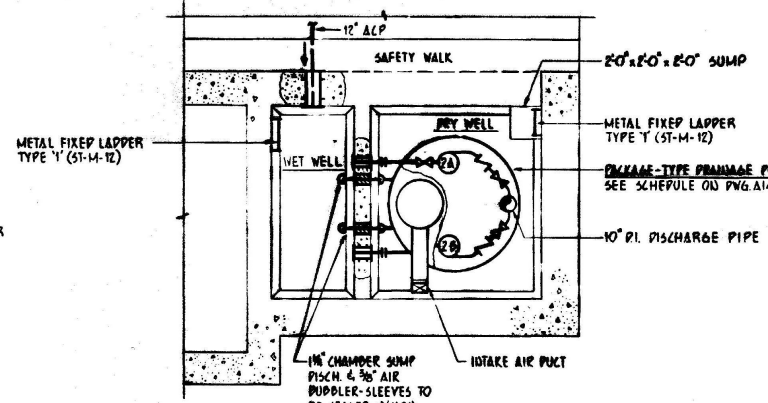
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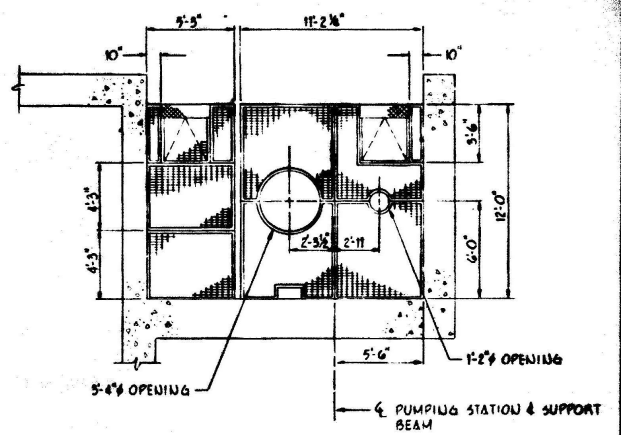
SECTION A-A



SECTION B-B



PLAN @ WET & DRY WELL



PLAN @ GRATING

WASHINGTON METROPOLITAN  
AREA TRANSIT AUTHORITY  
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BY: *[Signature]* AUG 31 1981  
RESIDENT ENGINEER DATE

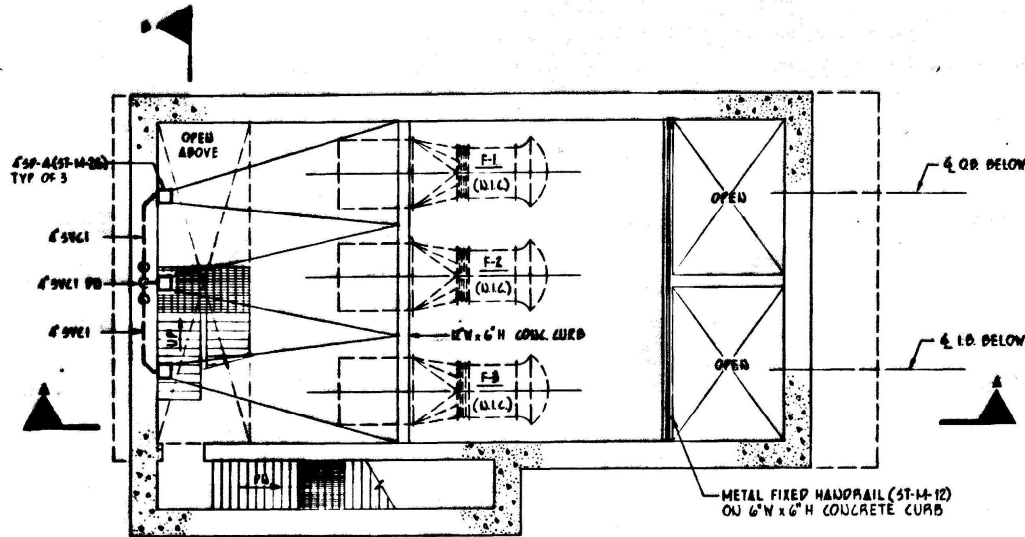
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AM-M-5	TRACK DRAINAGE PLAN & PROFILE						
AM-M-29	SCHEDULES, DIAGRAMS & DETAILS						
AM-M-14	TIE BREAKER STA & DRAINAGE PUMPING STA. 1P2						



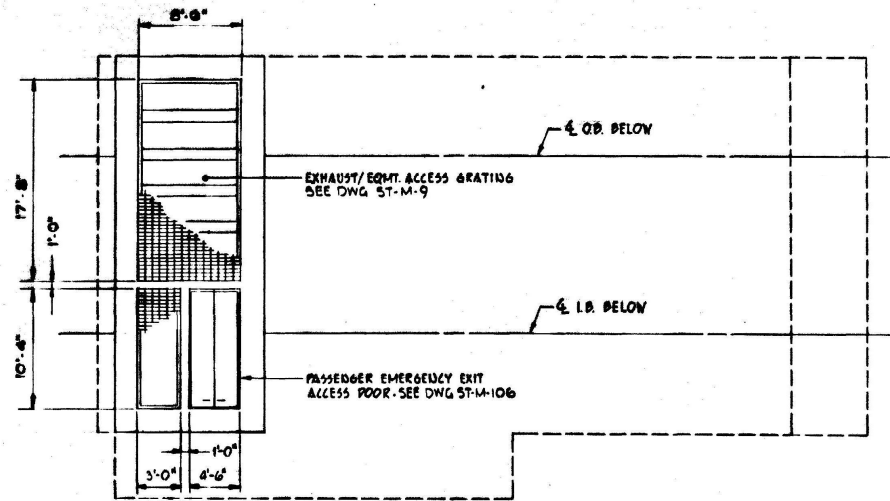
**WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY**  
BAKER - WIBBERLEY & ASSOCIATES, INC.  
CONSULTING ENGINEERS  
DE LEUW, CATHAR & COMPANY  
GENERAL ENGINEERING CONSULTANT  
HARRY WEESSE & ASSOCIATES  
GENERAL ARCHITECTURAL CONSULTANT  
SUBMITTED: *[Signature]* APPROVED: *[Signature]*

**ROCKVILLE ROUTE**  
**TIE BREAKER STATION & DRAINAGE PUMPING STA. 1P2**  
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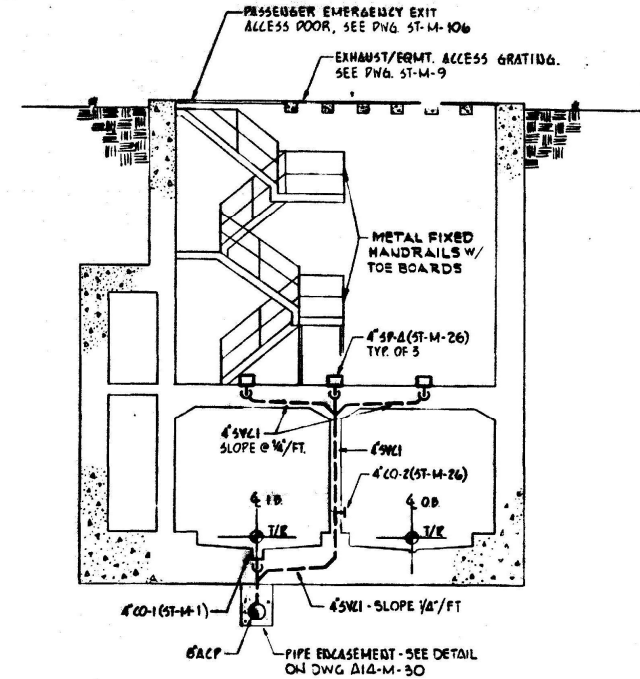




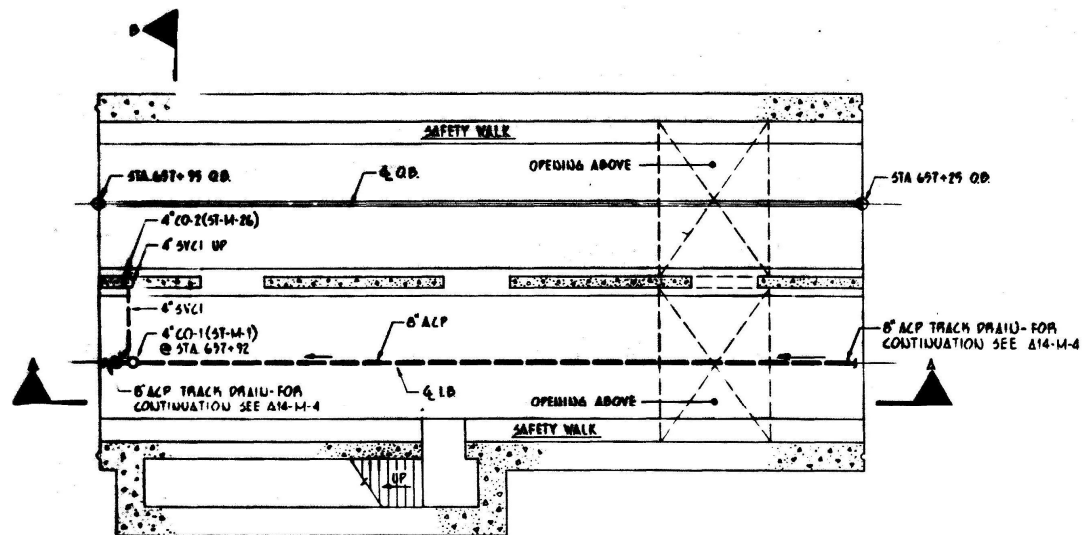
PLAN @ FAN ROOM LEVEL



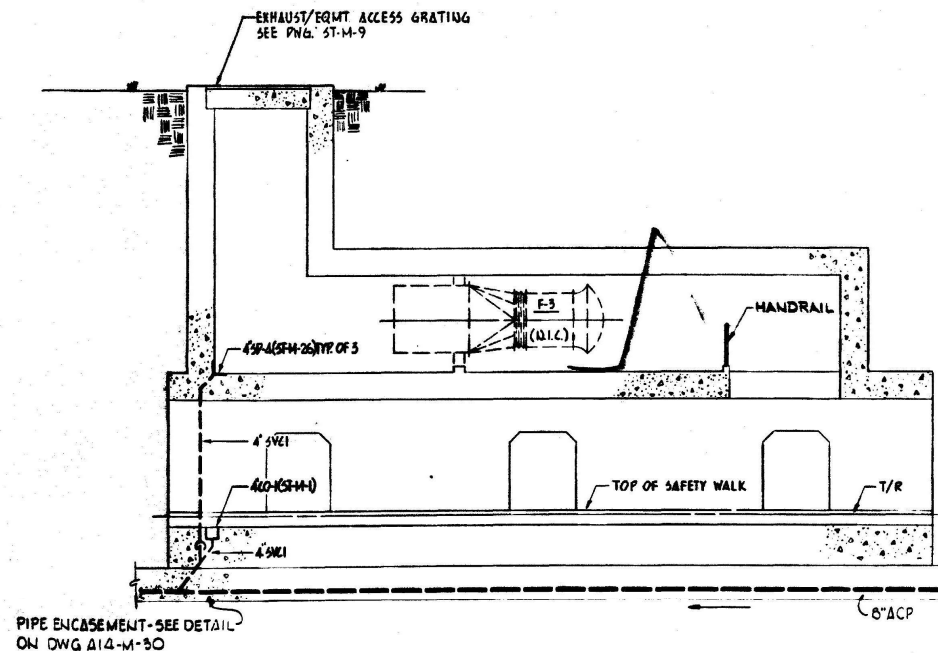
PLAN @ GRADE



SECTION B-B



PLAN @ TRACK LEVEL



SECTION A-A

WASHINGTON METROPOLITAN  
 AREA TRANSIT AUTHORITY  
**AS BUILT CONDITION**  
 BY *Chinwe...* 31 1981  
 RESIDENT ENGINEER DATE

DESIGNED	DATE	REFERENCE DRAWINGS		REVISIONS	
		NUMBER	DESCRIPTION	DATE	DESCRIPTION
RDW	2-25-77	A14-M-4	TRACK DRAINAGE & PROFILE		
RDW	2-18-77	ST-M-26	DRAINAGE DETAILS		
RDW	2-15-77	ST-M-106	ACCESS DOOR & STAIRS - EMERGENCY EXIT		
RDW	2-15-77	A14-M-16	FAN SHAFT NO. 2 & EMERGENCY EXIT		



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DE LEUW, CATHAR & COMPANY  
 GENERAL ENGINEERING CONSULTANT

HARRY WEESSE & ASSOCIATES  
 GENERAL ARCHITECTURAL

SULTON - CAMPBELL & ASSOC. ARCHITECTS  
 McNEILL & BALDWIN, INC. MECHANICAL - ELECTRICAL ENGINEERS

APPROVED: *[Signature]*

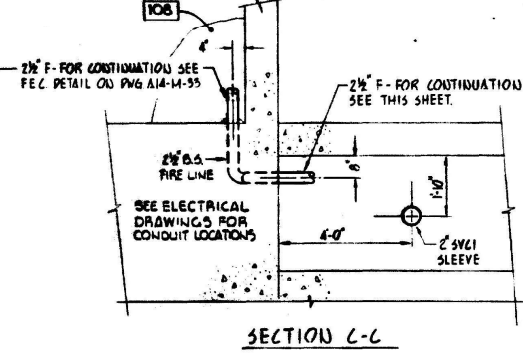
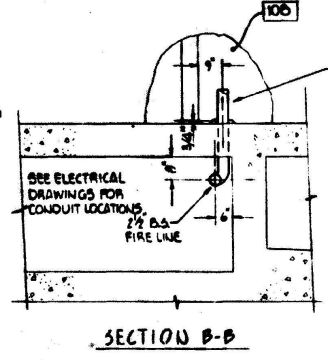
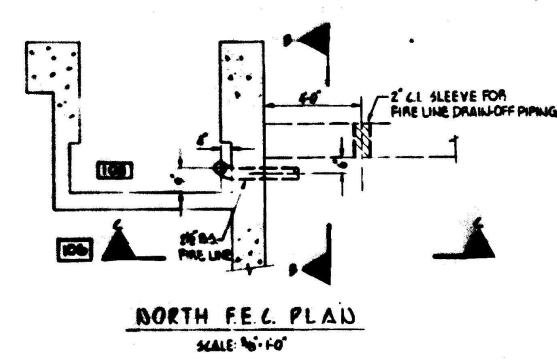
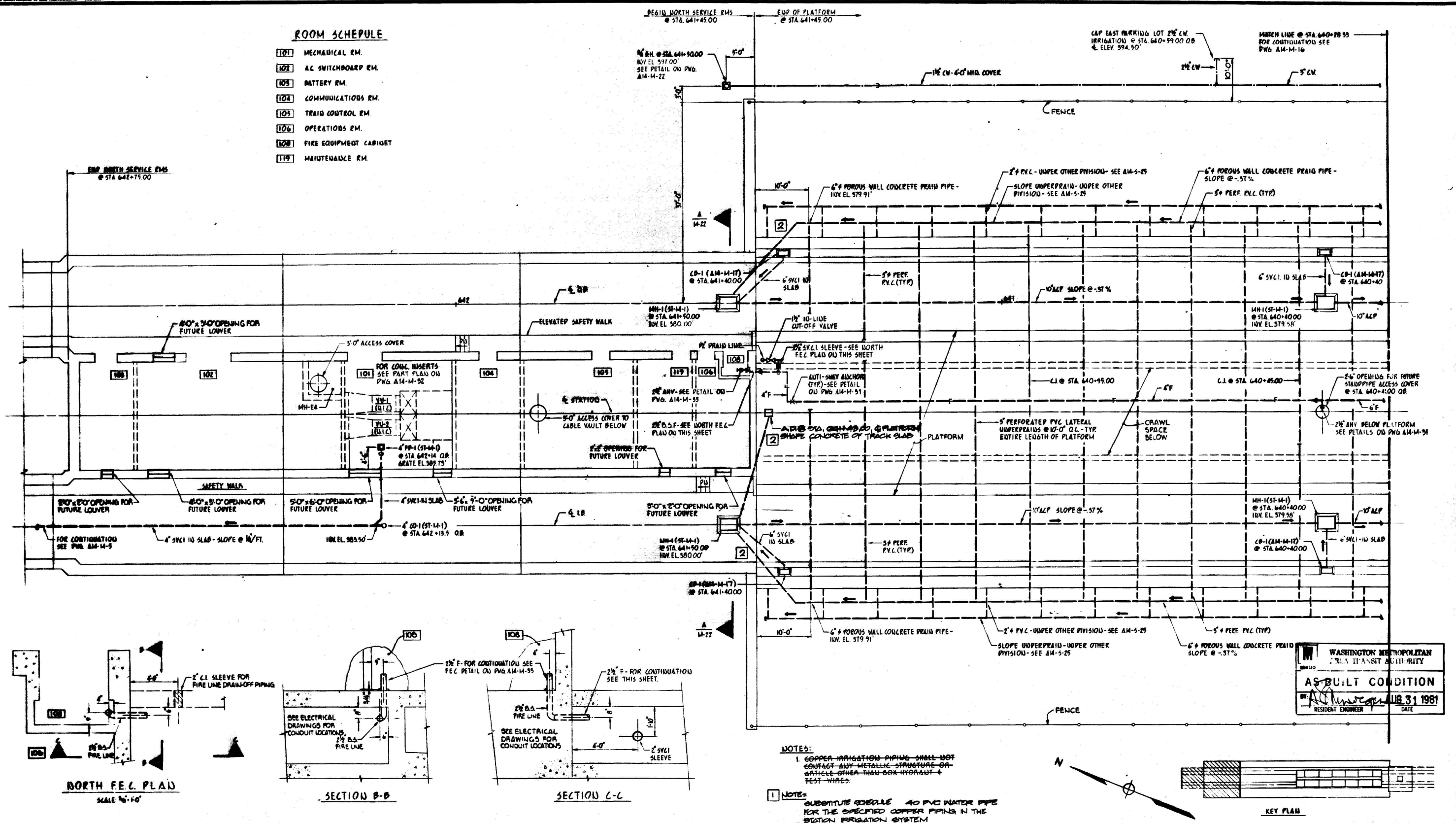
**ROCKVILLE ROUTE**  
**FAN SHAFT N#2 & EMERGENCY EXIT**  
 STA. 657+25 TO STA. 657+92

SCALE: 1" = 1'-0" 10 2 4 6 8 10

DRAWING NO. **A14-M-14** M-281-359

**ROOM SCHEDULE**

- 101 MECHANICAL RM.
- 102 AC SWITCHBOARD RM.
- 103 BATTERY RM.
- 104 COMMUNICATIONS RM.
- 105 TRAIN CONTROL RM.
- 106 OPERATIONS RM.
- 107 FIRE EQUIPMENT CABINET
- 108 MAINTENANCE RM.



**NOTES:**

- COPPER IRRIGATION PIPING SHALL NOT CONTACT ANY METALLIC STRUCTURE OR MATERIAL OTHER THAN BOX HYDRANT & TEST WIRES.
- NOTE: SUBSTITUTE GORILLA 40 PVC WATER PIPE FOR THE SPECIFIED COPPER PIPING IN THE STATION IRRIGATION SYSTEM.

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY  
**AS-BUILT CONDITION**  
 BY: *[Signature]* DATE: AUG 31 1981  
 RESIDENT ENGINEER

DESIGNED			REFERENCE DRAWINGS			REVISIONS		
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CHECKED	RDV	2-15-77	A14-M-22	DETAILS AND SECTIONS DETAILS N# 1				
APPROVED	RCD	2-15-77	A14-M-31	DETAILS SHEET N# 2				
			A14-M-33	FIRE EQUIPMENT CABINET DETAILS				
			A14-M-15	NICHOLSON LANE STA - NORTH SERVICE RMS				

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McNEILL & BALDWIN, INC. MECHANICAL - ELECTRICAL ENGINEERS

DE LEUW, CATHAR & COMPANY  
GENERAL ENGINEERING CONSULTANT

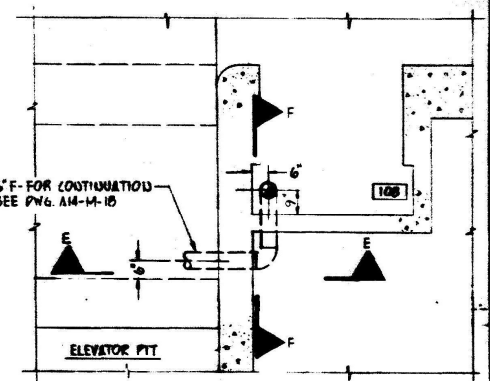
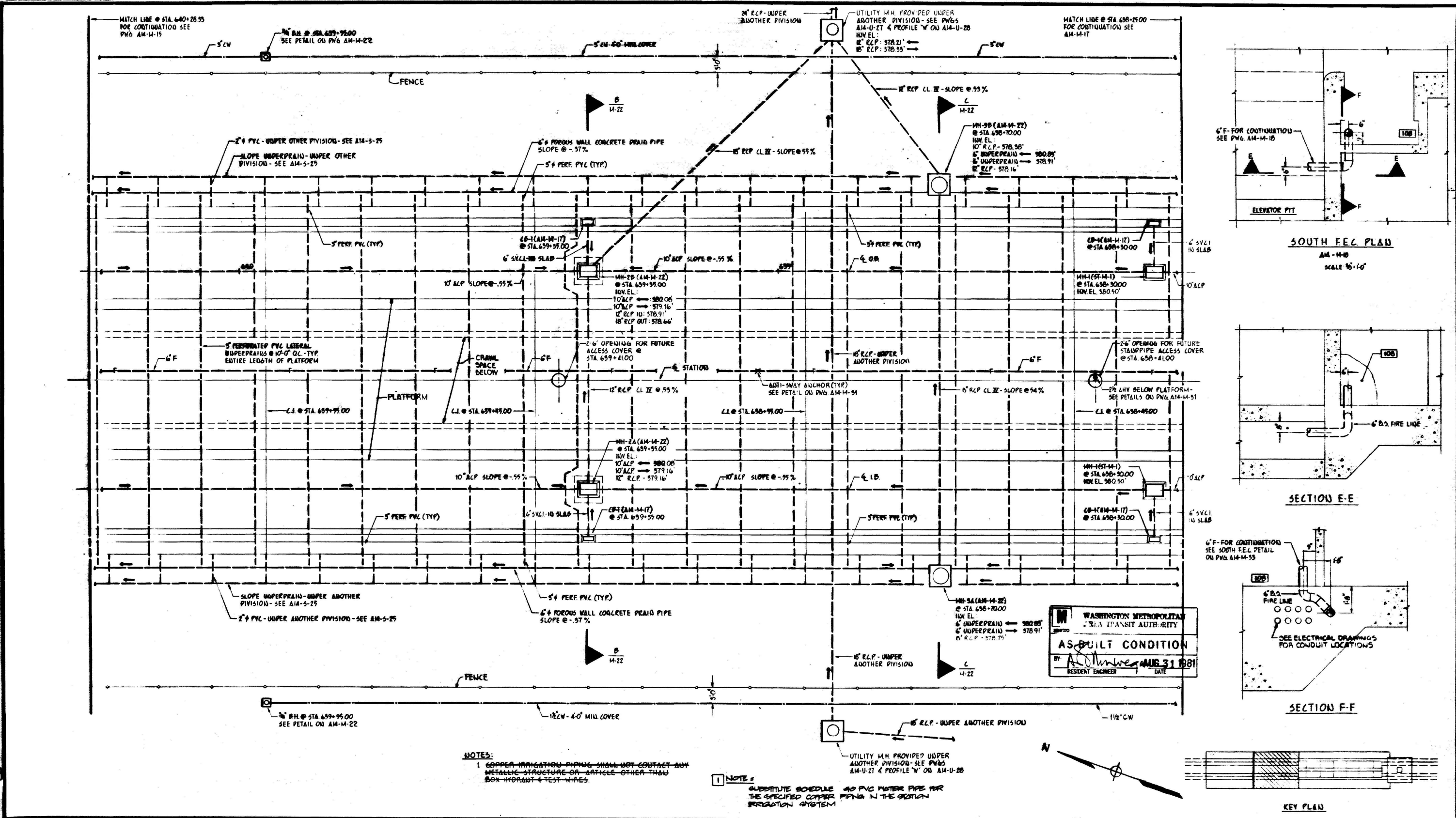
HARRY WEESE & ASSOCIATES  
GENERAL ARCHITECTURAL

SUBMITTED: *[Signature]* APPROVED: *[Signature]*

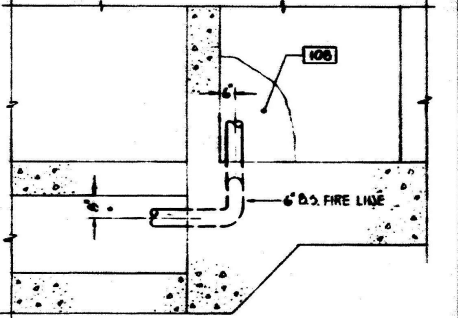
**ROCKVILLE ROUTE  
WHITE FLINT STATION  
NORTH SERVICE ROOMS & PLATFORM - PART A**

SCALE: 1" = 1'-0" 10 2 4 6 8 10

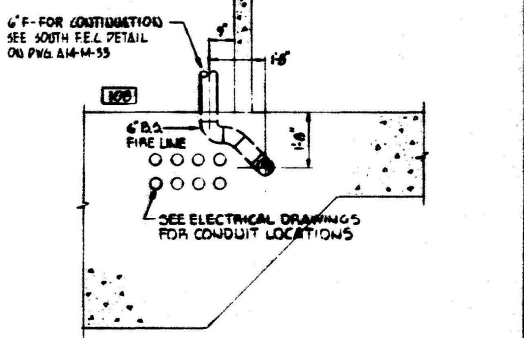
DRAWING NO. **A14-M-15** M-281-360



**SOUTH F.E.L. PLAN**  
AM-M-15  
SCALE 3/8"=1'-0"



**SECTION E-E**



**SECTION F-F**



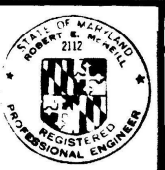
**KEY PLAN**

**NOTES:**  
1. COPPER INDICATION PIPING SHALL NOT CONTACT ANY METALLIC STRUCTURE OR ARTICLE OTHER THAN BOX HYDRANT & TEST TAPES.

**NOTE:**  
SUBSTITUTE SCHEDULE 40 PVC MASTER PIPE FOR THE SPECIFIED COPPER PIPING IN THE SECTION IRRIGATION SYSTEM

**WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY**  
**AS BUILT CONDITION**  
BY: *[Signature]* AUG 31 1981  
RESIDENT ENGINEER

DESIGNED		DATE		REFERENCE DRAWINGS		REVISIONS	
NUMBER	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
1	NORTH SERVICE RMS - PLATFORM - PART "A"	6-20-81	MD	REV PER P20-10, AS-BUILT			
2	PLATFORM - PART "C"						
3	DETAILS AND SECTIONS - SHEET NO 1						
4	DETAILS SHEET NO 2						
5	FIRE EQUIPMENT CABINET DETAILS						



**WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY**

BAKER - WIBBERLEY & ASSOCIATES, INC.  
CONSULTING ENGINEERS

DE LEUW, CATHER & COMPANY  
GENERAL ENGINEERING CONSULTANT

HARRY WEESSE & ASSOCIATES  
GENERAL ARCHITECTURAL ENGINEERS

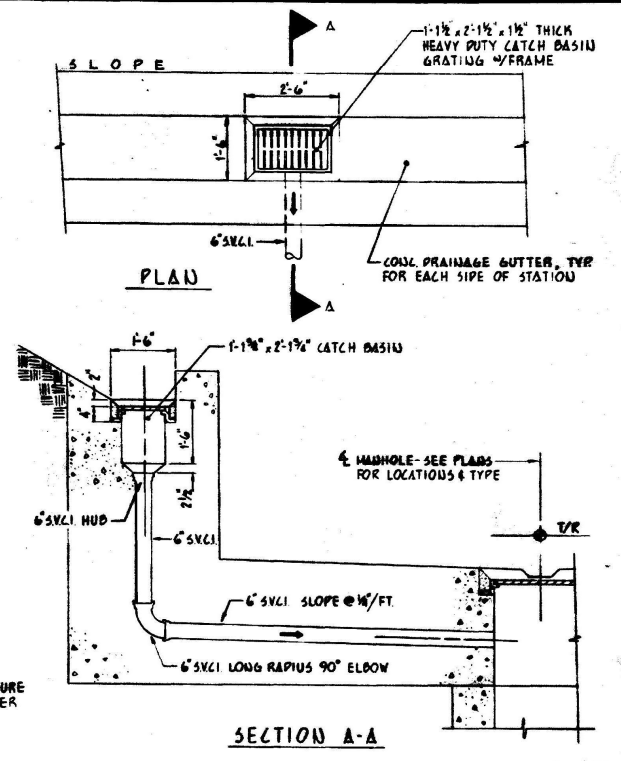
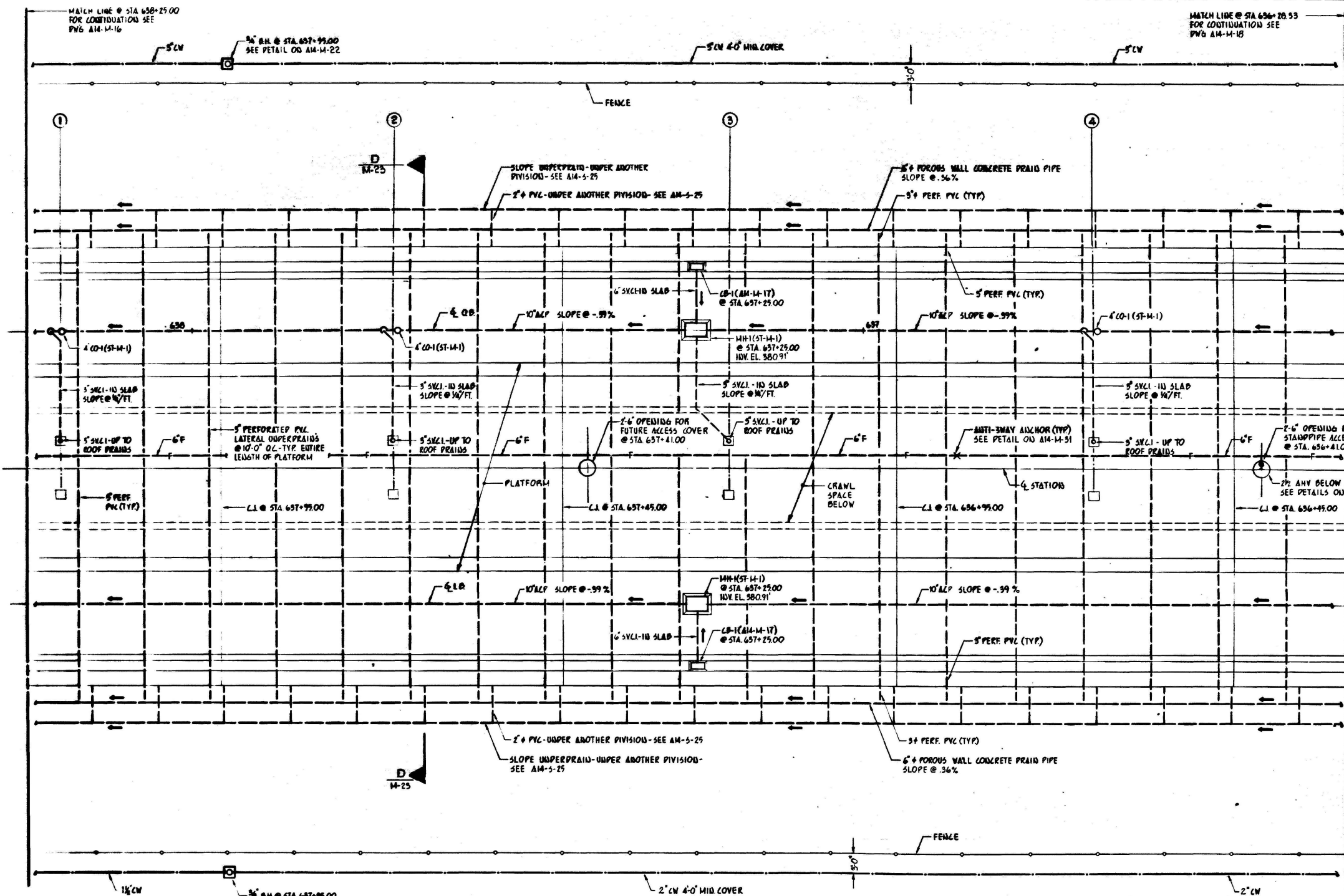
SULTON - CAMPBELL & ASSOC. ARCHITECTS  
Mc NEILL & BALDWIN, INC. MECHANICAL - ELECTRICAL ENGINEERS

APPROVED: *[Signature]*

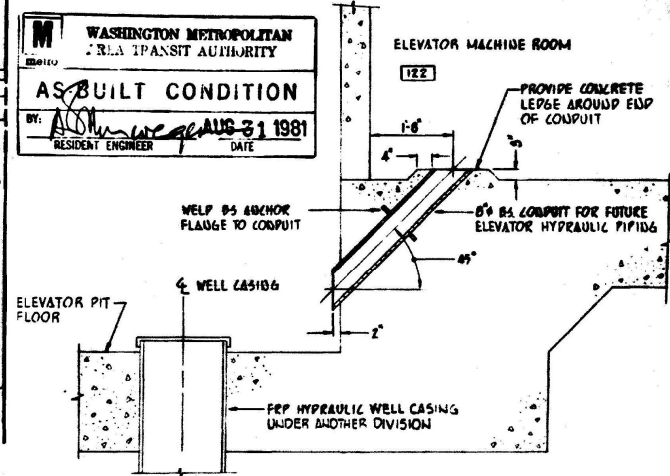
**ROCKVILLE ROUTE  
WHITE FLINT STATION  
PLATFORM - PART B**

SCALE: 1" = 1'-0" 10 2 4 6 8 10

DRAWING NO. **A14-M-16** **M-28F-361**

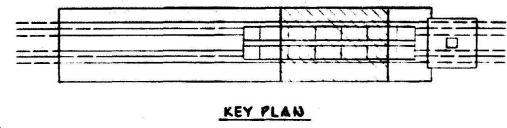
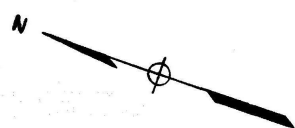


DETAIL OF CATCH BASIN-TYPE I  
NOT TO SCALE



SECTION P-P  
A14-M-18  
NOT TO SCALE

NOTES:  
1 COPPER IRRIGATION PIPING SHALL NOT CONTACT ANY METALLIC STRUCTURE OR ARTICLE OTHER THAN BOX HYDRANT & TEST WIRES.



DESIGNED		DATE		REFERENCE DRAWINGS		REVISIONS		DATE		BY		DESCRIPTION	
RTM	2-5-77	DAVE	DAVE	A14-M-16	PLATFORM PART "B"								
JMA	2-15-77	DAVE	DAVE	A14-M-18	PLATFORM PART "D" SOUTH SERV. RMS.								
RDW	2-2-77	DAVE	DAVE	A14-M-22	DETAILS AND SECTIONS - SHEET N° 1								
RDW	2-5-77	DAVE	DAVE	A14-M-23	DETAILS AND SECTIONS - SHEET N° 2								
RDW	2-5-77	DAVE	DAVE	A14-M-31	DETAILS SHEET N° 2								

**WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY**

BAKER - WIBBERLEY & ASSOCIATES, INC.  
CONSULTING ENGINEERS  
DE LEUW, CATHIER & COMPANY  
GENERAL ENGINEERING CONSULTANT  
HARRY WEESSE & ASSOCIATES  
GENERAL ARCHITECTS

**ROCKVILLE ROUTE  
WHITE FLINT STATION  
PLATFORM - PART C**  
SCALE 1" = 1'-0" 10 2 4 6 8 10  
DRAWING NO. A14-M-17 M-281-362



SULTON - CAMPBELL & ASSOC. ARCHITECTS  
Mc NEILL & BALDWIN, INC. MECHANICAL - ELECTRICAL ENGINEERS  
SUBMITTED: Robert E. McNeill

APPROVED: [Signature]

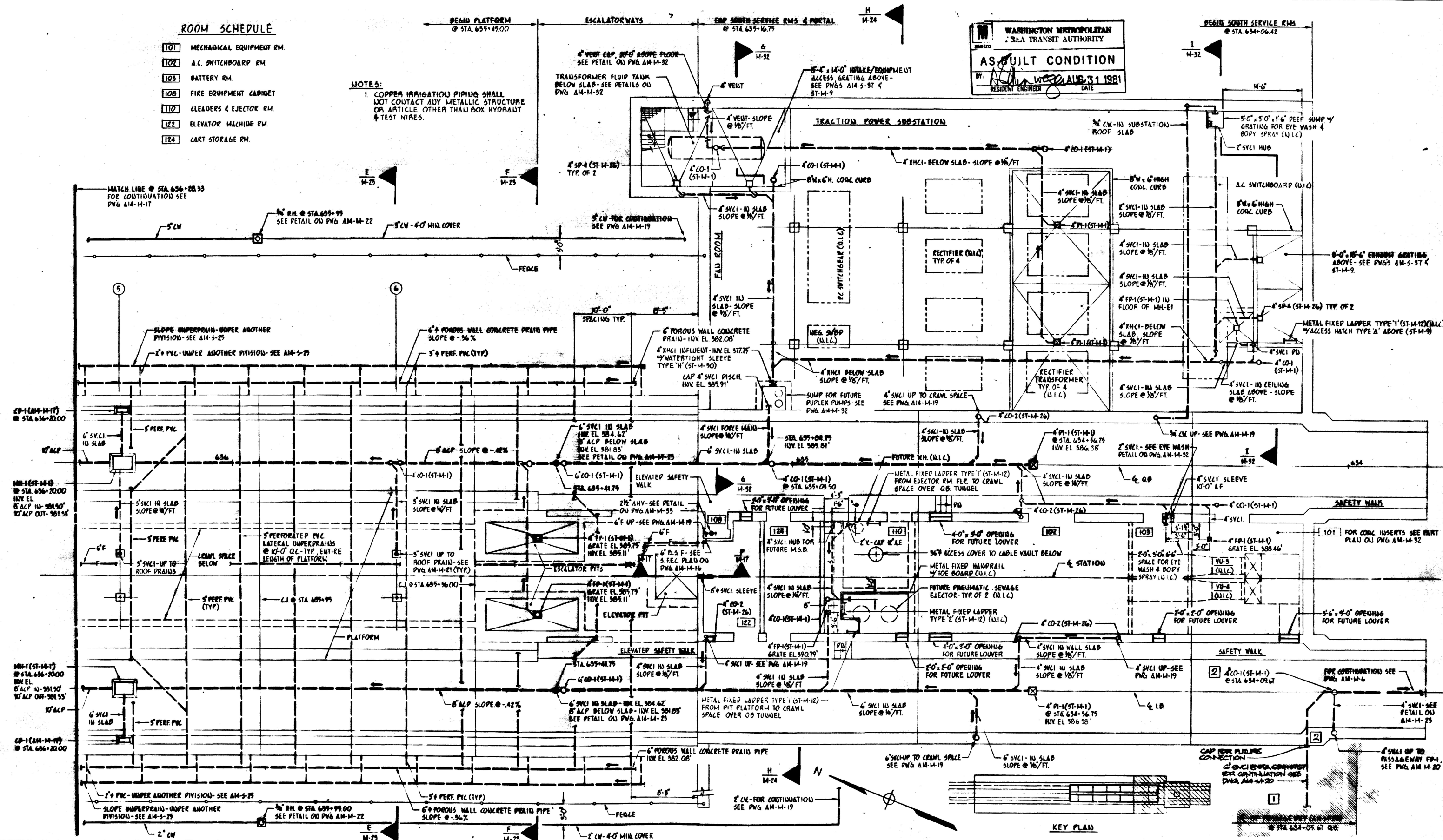
**ROOM SCHEDULE**

- 101 MECHANICAL EQUIPMENT RM.
- 102 A.C. SWITCHBOARD RM.
- 103 BATTERY RM.
- 108 FIRE EQUIPMENT CABINET
- 110 CLEANERS & EJECTOR RM.
- 122 ELEVATOR MACHINE RM.
- 124 CART STORAGE RM.

**NOTES:**

1 COPPER IRRIGATION PIPING SHALL NOT CONTACT ANY METALLIC STRUCTURE OR ARTICLE OTHER THAN BOX HYDRANT & TEST WIRES.

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY  
**AS-BUILT CONDITION**  
 BY: *[Signature]* DATE: AUG 31 1981  
 RESIDENT ENGINEER



DESIGNED	EDW	8-15-77
DRAWN	WAA	8-15-77
CHECKED	RDW	8-15-77
APPROVED	BCD	8-15-77

NUMBER	DESCRIPTION	DATE	BY	REVISIONS
A14-M-1	ABBREVIATIONS, NOTES AND SYMBOLS	10-8-80	BW	1) PCO-30-DELETED U.G. PASSAGEWAY
A14-M-17	PLATFORM PART "C"	6-25-81	MP	2) REV. PER FIELD COND. AS-BUILT
A14-M-19	MEZ ZANINE			
A14-M-21	UNDERPASS			
A14-M-32	DETAILS SHEET N° 3			
A14-M-33	FIRE EQUIPMENT CABINET DETAILS			

NUMBER	DESCRIPTION	DATE	BY	REVISIONS



**WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY**

BAKER - WIDDERLEY & ASSOCIATES, INC.  
CONSULTING ENGINEERS

SULTON - CAMPBELL & ASSOC. ARCHITECTS  
Mc NEILL & BALDWIN, INC. MECHANICAL - ELECTRICAL ENGINEERS

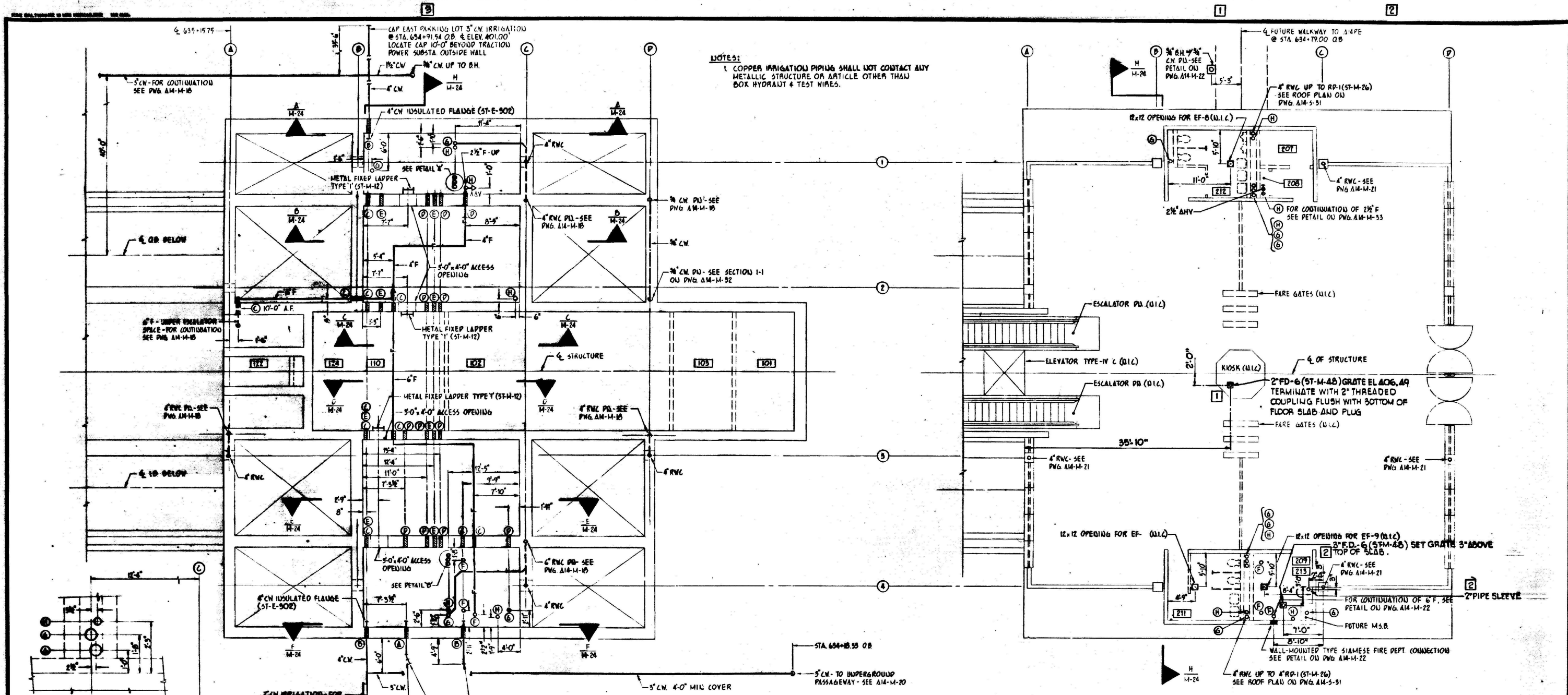
DE LEUW, CATHAR & COMPANY  
GENERAL ENGINEERING CONSULTANT

HARRY WEENE & ASSOCIATES  
GENERAL ARCHITECTURAL CONSULTANT

APPROVED: *[Signature]*

**ROCKVILLE ROUTE  
WHITE FLINT STATION  
TRACTION POWER SUBSTATION  
SOUTH SERVICE ROOMS & PLATFORM - PART D**

SCALE: 1" = 1'-0" 10 2 4 6 8 10  
DRAWING NO. A14-M-18 M-281-363



**NOTES:**  
 1 COPPER IRRIGATION PIPING SHALL NOT CONTACT ANY METALLIC STRUCTURE OR ARTICLE OTHER THAN BOX HYDRAULIC TEST WIRES.

**MEZZANINE CRAWL SPACE**

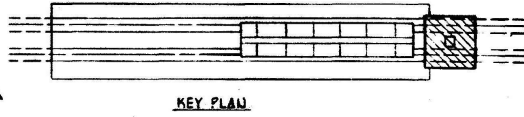
SLEEVE SIZE	A	B	C	D	E	F	G	H
	4"							
6"								
8"								
10"								
12"								
14"								
16"								
18"								
20"								
24"								
30"								
36"								
42"								
48"								
54"								
60"								

**ROOM SCHEDULE**

- 101 MECHANICAL EQUIPMENT RM.
- 102 A.C. SWITCHBOARD RM.
- 103 BATTERY RM.
- 110 CLEANERS & EJECTORS RM.
- 122 ELEVATOR MACHINE RM.
- 124 CART STORAGE RM.
- 207 BELL SYSTEM RM.
- 208 FIRE EQUIPMENT CABINET
- 209 CLEANERS RM.
- 211 WOMEN'S WASHROOM
- 212 MEN'S WASHROOM
- 213 WATER SERVICE RM.

**MEZZANINE FLOOR PLAN**

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY  
**AS-BUILT CONDITION**  
 BY: *[Signature]* AUG 31 1981  
 RESIDENT ENGINEER DATE



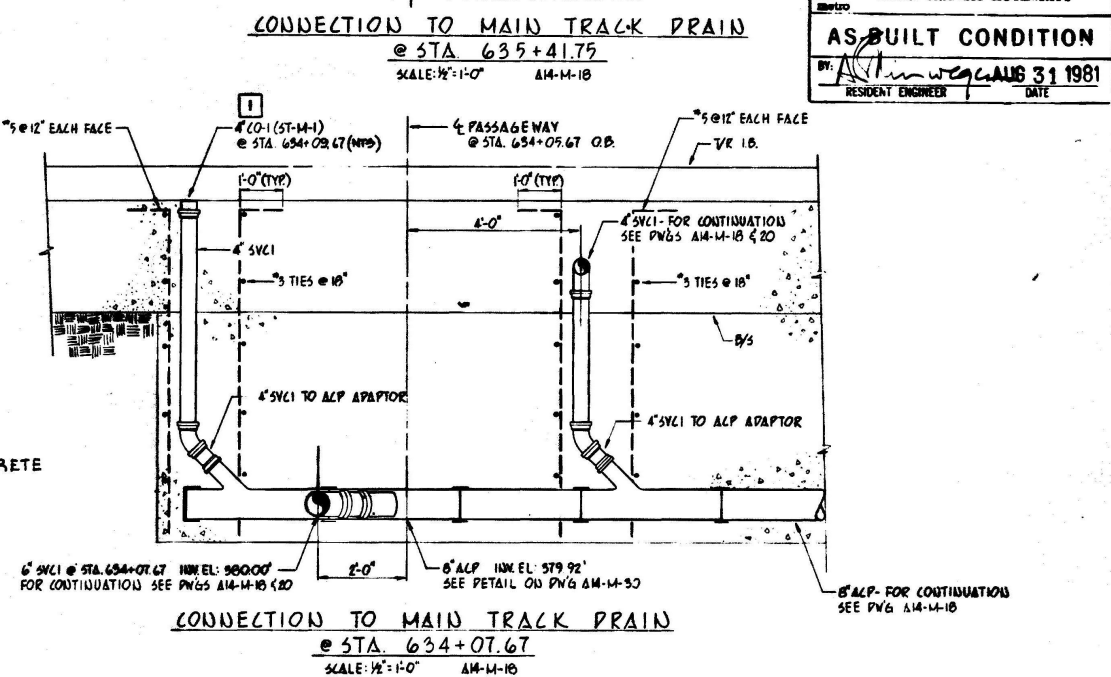
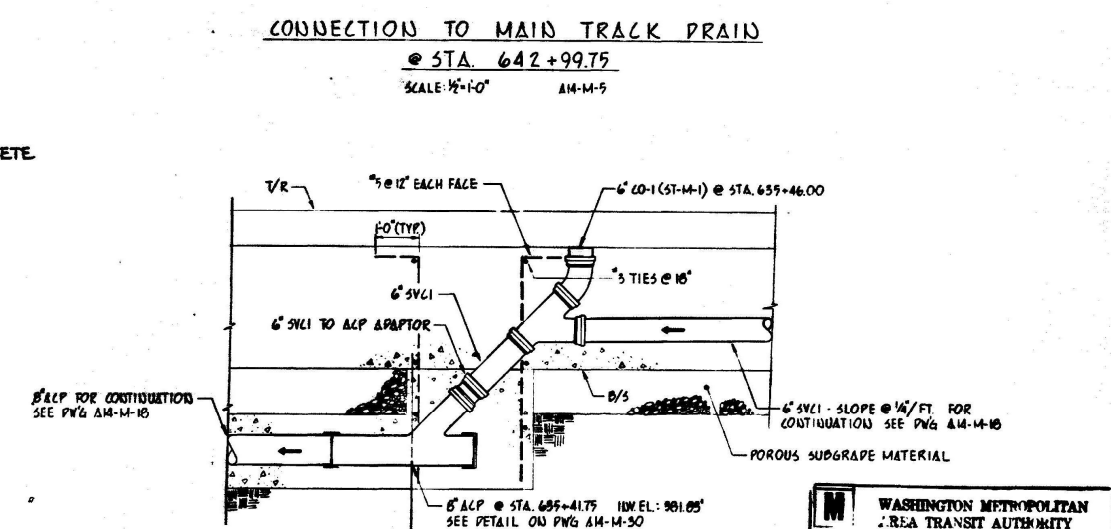
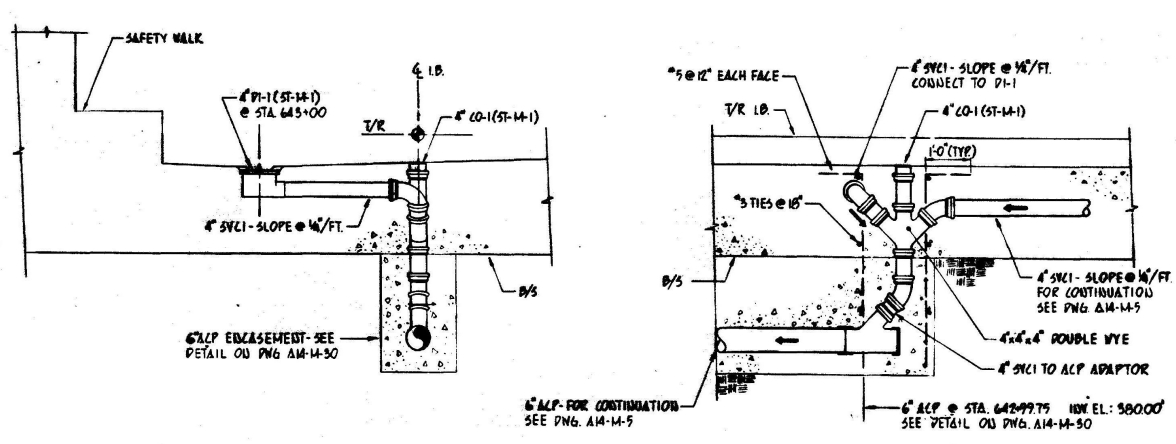
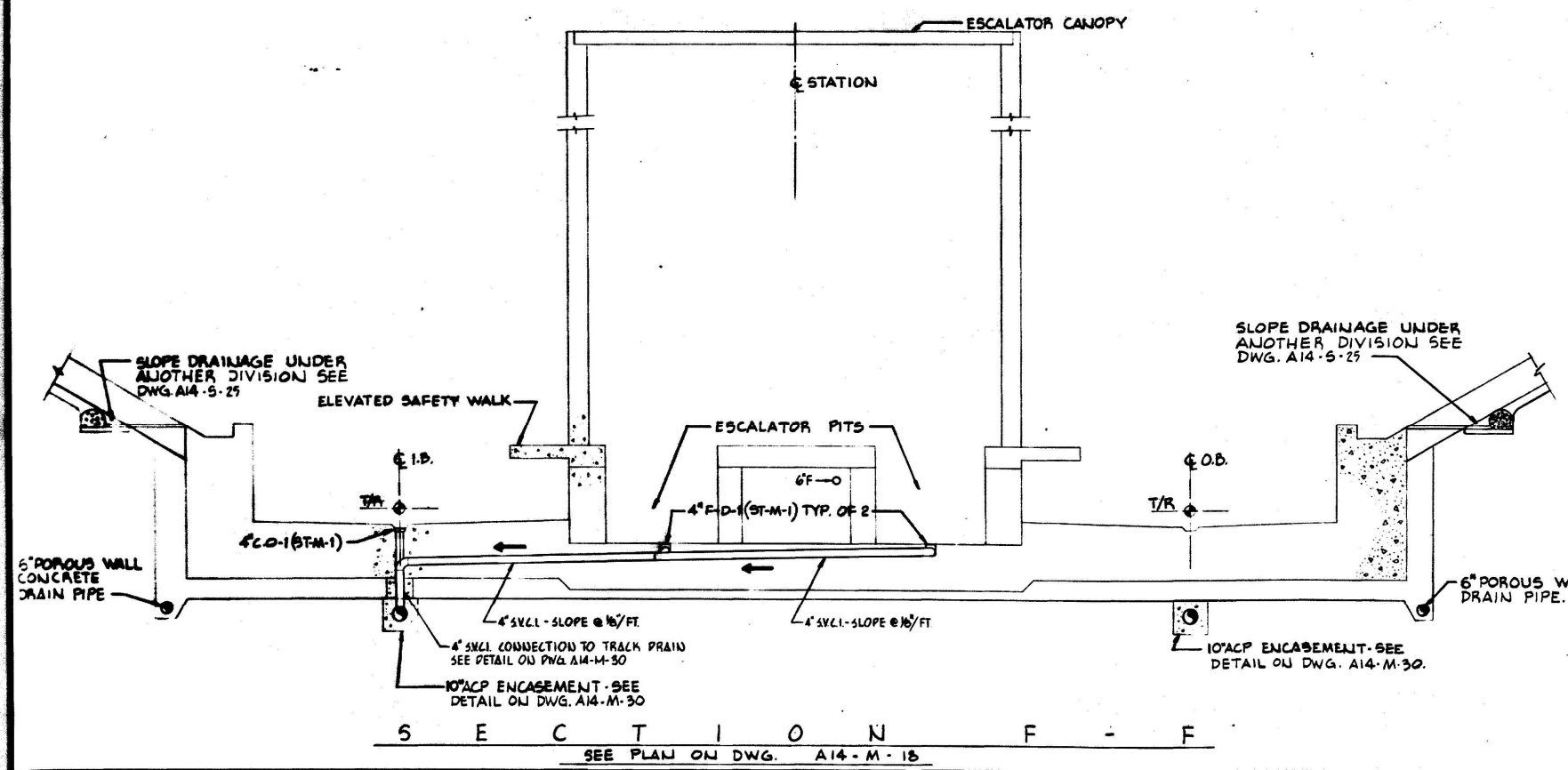
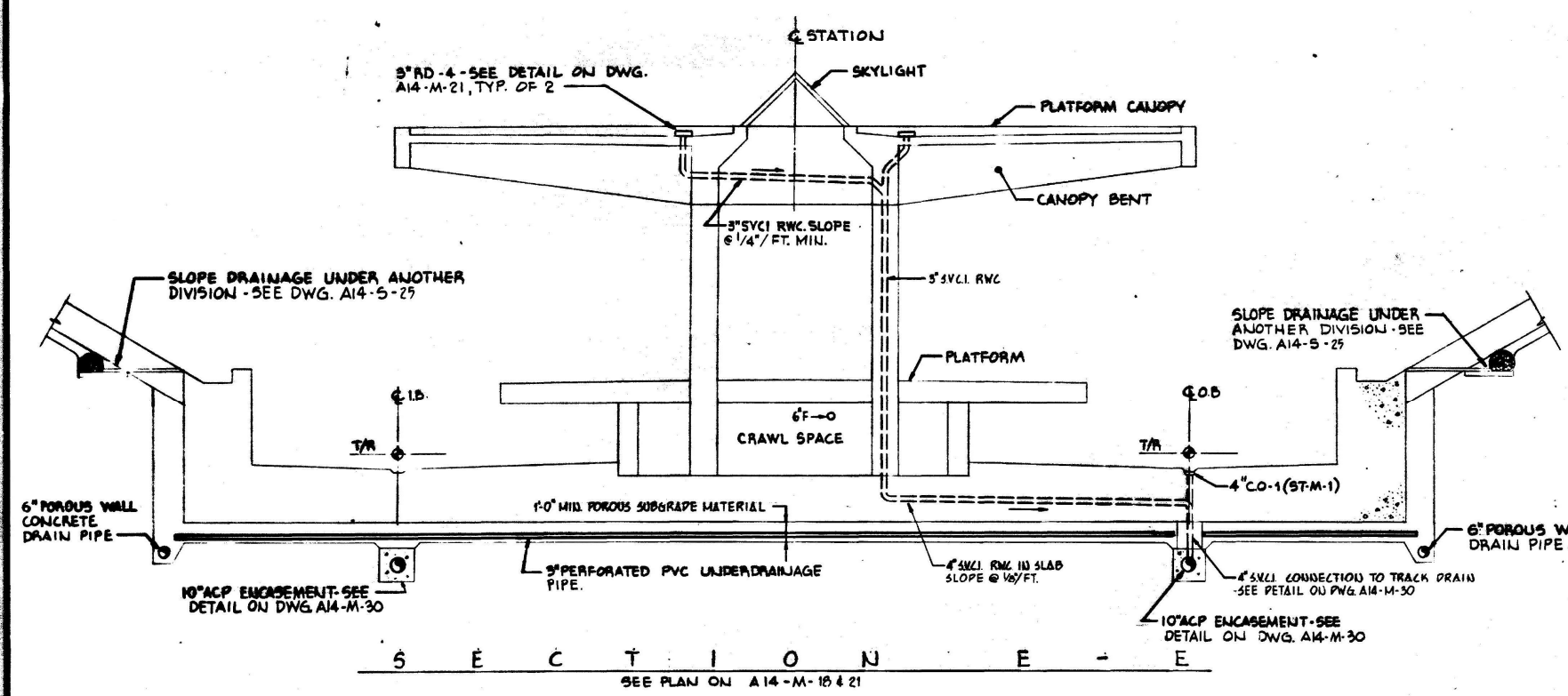
DESIGNED	DATE	NUMBER	DESCRIPTION	DATE	BY	DESCRIPTION
RDV	8-5-77	A14-M-18	SOUTH SERV. RM. AND TRAC. PWR. SUBSTATION	1-29-79	B-W	1) PCO-21 ADDED 2" FD-G
DRAWN	8-5-77	A14-M-20	PASSAGEWAY	2-30-80	B-W	2) PCO-54 ADD 3" FD & 2" PIPE SLEEVE
CHECKED	8-5-77	A14-M-21	CANOPY PLANS	2-25-81	MD	3) REV. PER PCO-50, AS-BUILT
APPROVED	8-5-77	A14-M-22	DETAILS AND SECTIONS N# 2			
		A14-M-24	DETAILS AND SECTIONS N# 3			
		A14-M-25	DETAILS SHEET N# 2			

DESIGNED	DATE	NUMBER	DESCRIPTION	DATE	BY	DESCRIPTION
RDV	8-5-77	A14-M-18	SOUTH SERV. RM. AND TRAC. PWR. SUBSTATION	1-29-79	B-W	1) PCO-21 ADDED 2" FD-G
DRAWN	8-5-77	A14-M-20	PASSAGEWAY	2-30-80	B-W	2) PCO-54 ADD 3" FD & 2" PIPE SLEEVE
CHECKED	8-5-77	A14-M-21	CANOPY PLANS	2-25-81	MD	3) REV. PER PCO-50, AS-BUILT
APPROVED	8-5-77	A14-M-22	DETAILS AND SECTIONS N# 2			
		A14-M-24	DETAILS AND SECTIONS N# 3			
		A14-M-25	DETAILS SHEET N# 2			



**WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY**  
 BAKER - WIBBERLEY & ASSOCIATES, INC. CONSULTING ENGINEERS  
 DE LEUW, CATHAR & COMPANY GENERAL ENGINEERING CONSULTANT  
 HARRY WEESSE ASSOCIATES GENERAL ARCHITECTURAL CONSULTANT  
 SULTON - CAMPBELL & ASSOC. ARCHITECTS  
 Mc NEILL & BALDWIN, INC. MECHANICAL - ELECTRICAL ENGINEERS  
 SUBMITTED: *[Signature]* APPROVED: *[Signature]*

**ROCKVILLE ROUTE WHITE FLINT STATION MEZZANINE AND MEZZANINE CRAWL SPACE**  
 SCALE: 1" = 1'-0" AND AS NOTED  
 DRAWING NO. A14-M-19 M-261-364



WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY  
AS-BUILT CONDITION  
BY: [Signature] DATE: AUG 31 1981  
RESIDENT ENGINEER

DESIGNED		DATE		NUMBER		DESCRIPTION		DATE		BY		DESCRIPTION	
ZDN		2-15-77		14-M-5		TRACK DRAINAGE PLAN & PROFILE		6-25-81		MD		REV FOR FIELD CONR. AS-BUILT	
DRAWN		2-15-77		14-M-8		TRACK DRAINAGE PLAN & PROFILE							
CHECKED		2-15-77		14-M-18		PLATFORM PART 'D' & SOUTH SERVICE RMS.							
APPROVED		2-15-77		14-M-21		CANOPY PLANS							
		2-15-77		14-M-30		TRACK DRAINAGE DETAILS							

**WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY**

BAKER - WIBBERLEY & ASSOCIATES, INC.  
CONSULTING ENGINEERS

DE LEUW, CATHAR & COMPANY  
GENERAL ENGINEERING CONSULTANT

HARRY WEESE & ASSOCIATES  
GENERAL ARCHITECTURAL ENGINEERS

SULTON - CAMPBELL & ASSOC. ARCHITECTS  
MECHANICAL - ELECTRICAL ENGINEERS

Mc NEILL & BALDWIN, INC.  
MECHANICAL - ELECTRICAL ENGINEERS

APPROVED: [Signature]

**ROCKVILLE ROUTE  
WHITE FLINT STATION  
DETAILS AND SECTIONS - SHEET N° 2**

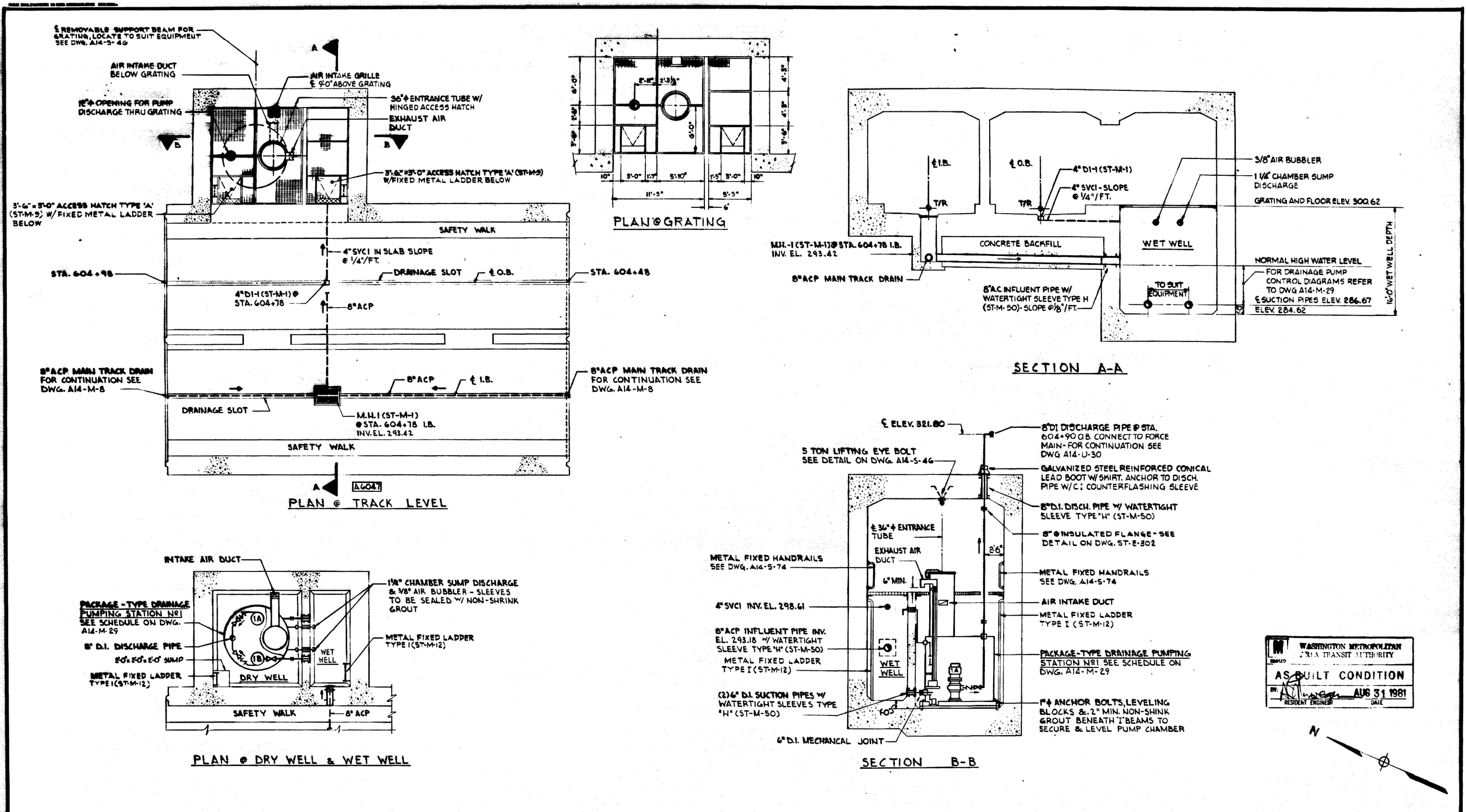
SCALE: 1/2"=1'-0" AND AS NOTED

DRAWING NO. A14-M-23

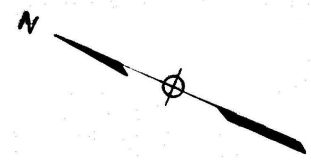
M-281-368



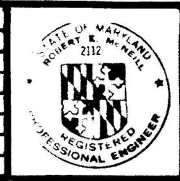




WASHINGTON METROPOLITAN  
 AREA TRANSIT AUTHORITY  
 AS BUILT CONDITION  
 BY: *[Signature]* RESIDENT ENGINEER  
 DATE: AUG 31 1981



DESIGNED	R.D.W.	2-15-77	REFERENCE DRAWINGS		REVISIONS		
			NUMBER	DESCRIPTION	DATE	BY	DESCRIPTION
DRAWN	M.J.P.	2-15-77	A14-M-8	TRACK DRAINAGE PLAN AND PROFILE			
CHECKED	R.D.W.	2-15-77	A14-M-29	SCHEDULES, DIAGRAMS AND DETAILS			
APPROVED	R.D.P.	2-15-77	A14-S-46	DRAINAGE PUMPING STA. NO. 1			



**WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY**

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 CONSULTING ENGINEERS

DE LEUW, CATHER & COMPANY  
 GENERAL ENGINEERING CONSULTANT

HARRY WEEBE & ASSOCIATES  
 GENERAL ARCHITECTURAL CONSULTANT

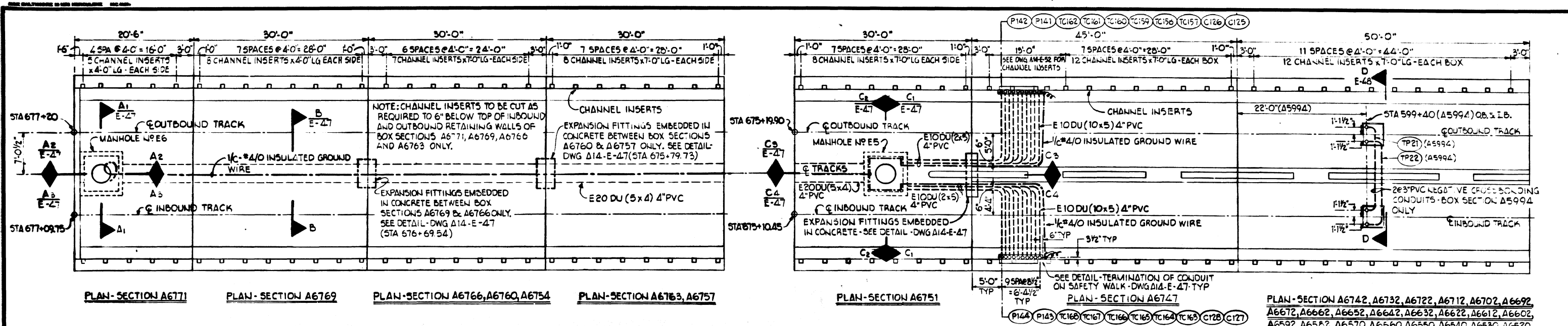
SULTON - CAMPBELL & ASSOC. ARCHITECTS  
 Mc NEILL & BALDWIN, INC. MECHANICAL - ELECTRICAL ENGINEERS

APPROVED: *[Signature]*

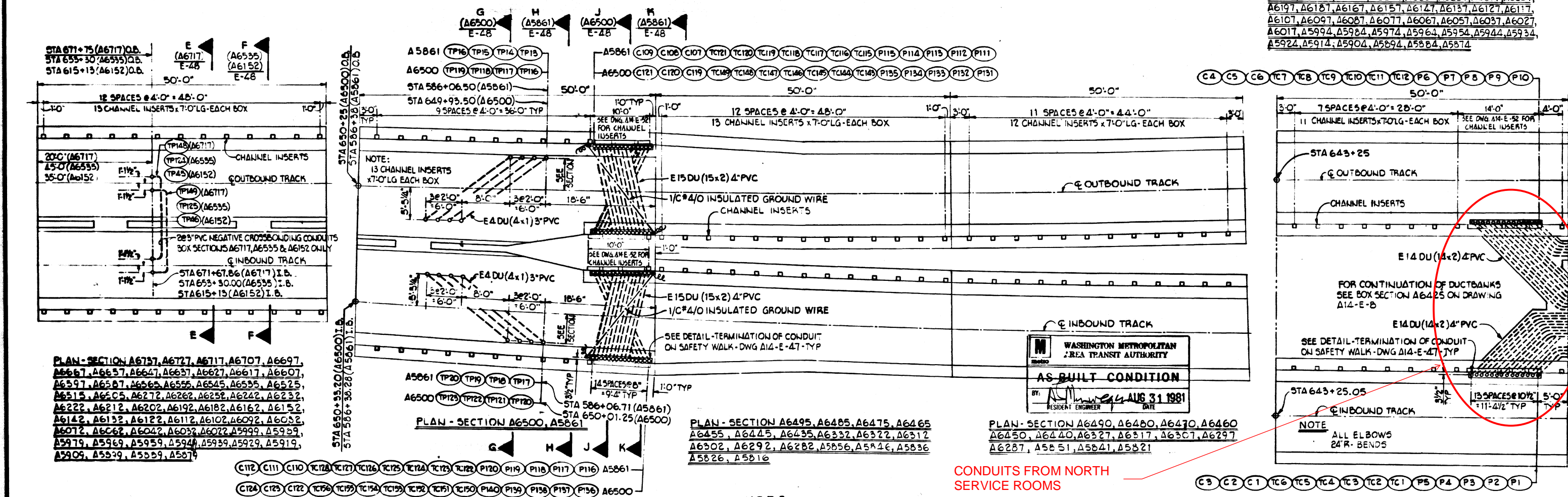
**ROCKVILLE ROUTE  
 DRAINAGE PUMPING STATION NO. 1  
 STATION 604+98 TO STATION 604+48**

SCALE:  $\frac{3}{16}'' = 1'-0''$

DRAWING NO. A14-M-25 M-281-370



PLAN-SECTION A6742, A6732, A6722, A6712, A6702, A6692, A6672, A6662, A6652, A6642, A6632, A6622, A6612, A6602, A6592, A6582, A6570, A6560, A6550, A6540, A6530, A6520, A6510, A6267, A6257, A6247, A6237, A6227, A6217, A6207, A6197, A6187, A6167, A6157, A6147, A6137, A6127, A6117, A6107, A6097, A6087, A6077, A6067, A6057, A6037, A6027, A6017, A5994, A5984, A5974, A5964, A5954, A5944, A5934, A5924, A5914, A5904, A5894, A5884, A5874



WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY  
**AS-BUILT CONDITION**  
 BY: [Signature] AUG 31 1981  
 RESIDENT ENGINEER DATE

**NOTE:**  
 ALL CHANNEL INSERTS LOCATED ON THIS DRAWING ARE 7FT-0IN LONG  
 SEE DETAIL ON DRAWING NO ST-E-15, UNLESS OTHERWISE NOTED.

DESIGNED	DATE	NUMBER	DESCRIPTION	DATE	BY	DESCRIPTION
JHL	2-15-77	14-E-47	ELECTRICAL DETAILS - SHEET NO 3			
JHL	2-15-77	14-E-48	ELECTRICAL DETAILS - SHEET NO 4			
RCD	2-15-77	14-3-10	UNIT - A6771			
RCD	2-15-77	14-3-43	UNITS - A6500, A5861			
RCD	2-15-77	14-3-68	UNIT - A6751			

**WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY**

BAKER - WIDDERLEY & ASSOCIATES, INC.  
 CONSULTING ENGINEERS

SULTON - CAMPBELL & ASSOC. ARCHITECTS  
 Mc NEILL & BALDWIN, INC.  
 MECHANICAL - ELECTRICAL ENGINEERS

DE LEUW, CATHER & COMPANY  
 GENERAL ENGINEERING CONSULTANT

HARRY WEES & ASSOCIATES  
 GENERAL ELECTRICAL ENGINEER

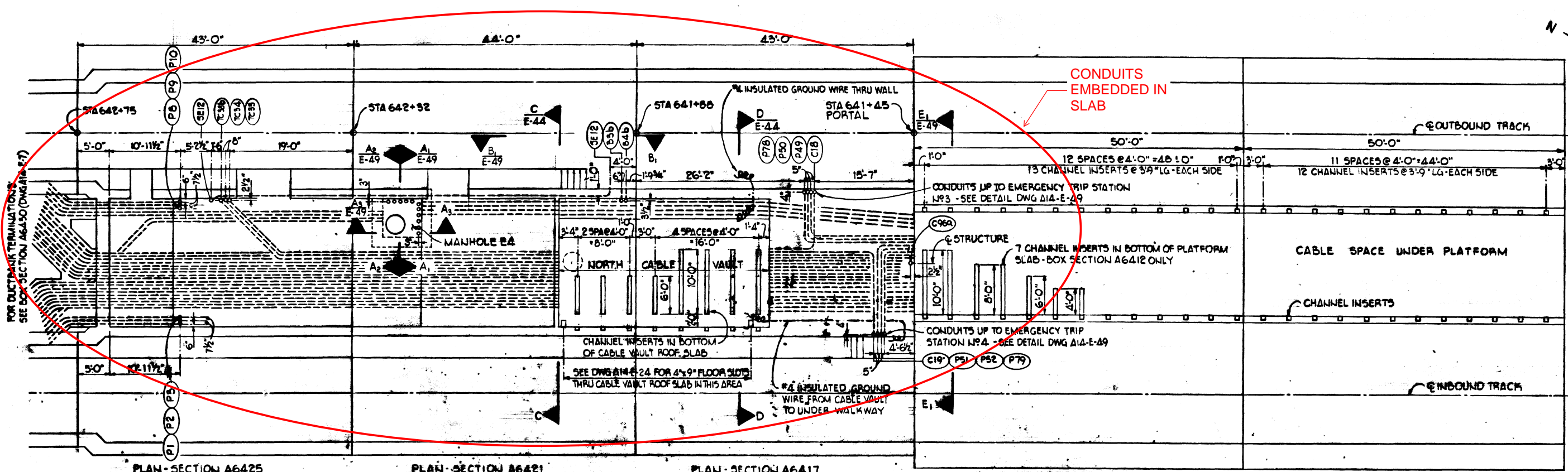
APPROVED: [Signature]

**ROCKVILLE ROUTE**  
**ELECTRICAL DETAILS**  
**BOX SECTIONS - SHEET NO 1**

SCALE: 1" = 10'-0"

DRAWING NO. **A14-E-7**

**D12**  
**28395**

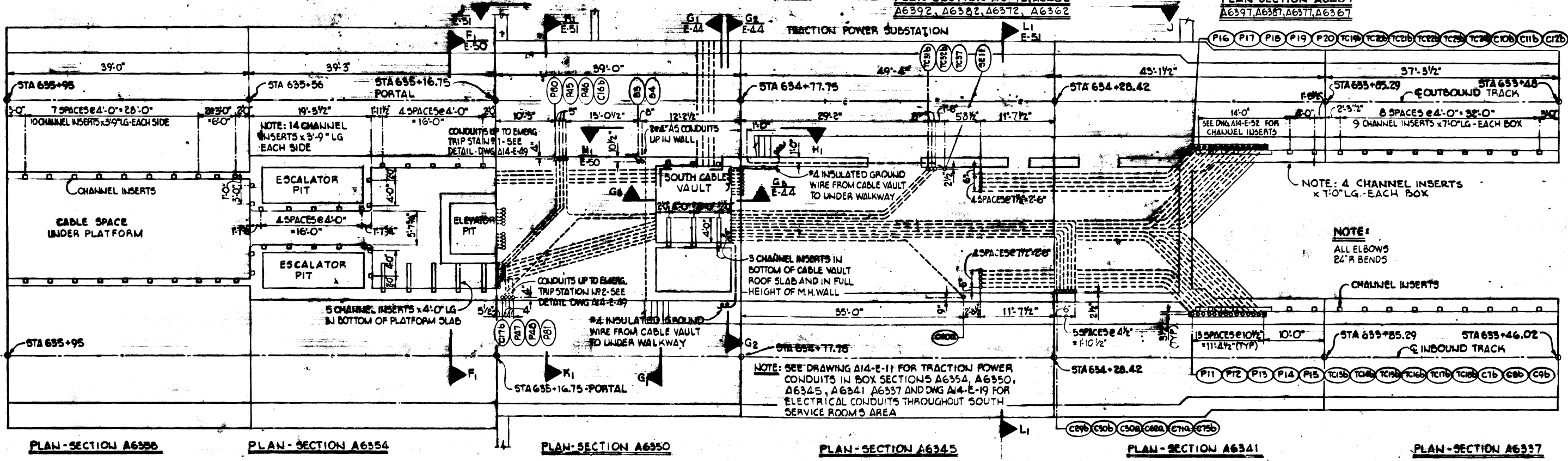


WASHINGTON METROPOLITAN  
TRANSIT AUTHORITY

AS-BUILT CONDITION

BY: *[Signature]* DATE: AUG 31 1981

REGISTERED ENGINEER



DESIGNED: J.H.L. DATE: 8-12-77

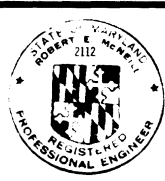
DRAWN: A.L.P. DATE: 8-15-77

CHECKED: R.C.D. DATE: 8-15-77

APPROVED: R.C.D. DATE: 8-17-77

NUMBER	DESCRIPTION	DATE	BY	DESCRIPTION
A14-E-44	ELECTRICAL DETAILS - SHEET NO 2			
A14-E-49	ELECTRICAL DETAILS - SHEET NO 5			
A14-E-50	ELECTRICAL DETAILS - SHEET NO 6			
A14-E-51	ELECTRICAL DETAILS - SHEET NO 7			
A14-S-19	NORTH SERVICE ROOMS			
A14-S-29	SOUTH SERVICE ROOMS			

DATE	BY	DESCRIPTION



**WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY**

BAKER - WIBBERLEY & ASSOCIATES, INC.  
CONSULTING ENGINEERS

SULTON - CAMPBELL & ASSOC. ARCHITECTS  
Mc NEILL & BALDWIN, INC. MECHANICAL - ELECTRICAL ENGINEERS

SUBMITTED: *[Signature]*

DE LEUW, CATHER & COMPANY  
GENERAL ENGINEERING CONSULTANT

HARRY WEEBE & ASSOCIATES  
GENERAL ARCHITECTURAL CONSULTANT

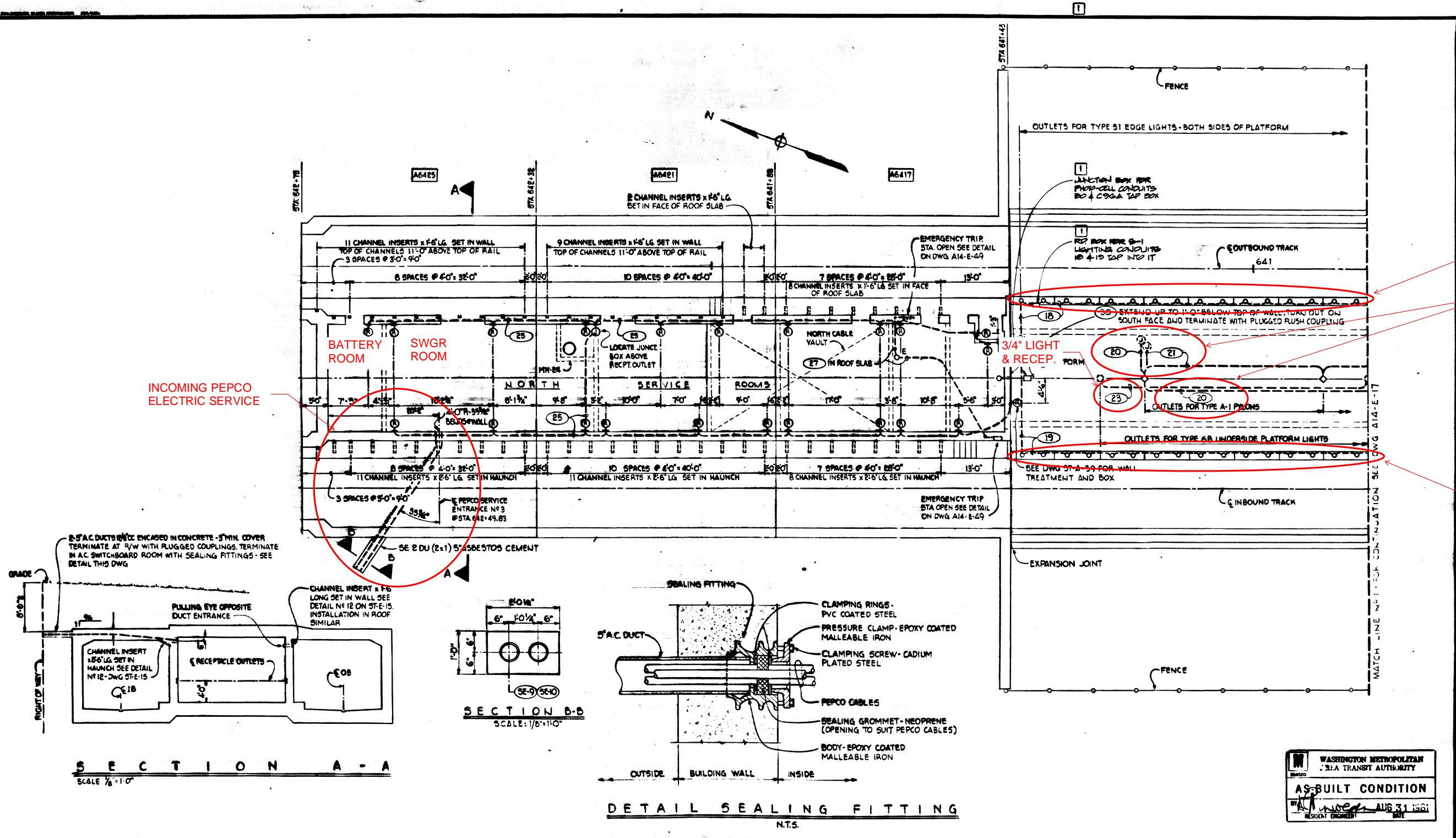
APPROVED: *[Signature]*

**ROCKVILLE ROUTE**  
ELECTRICAL DETAILS  
BOX SECTIONS - SHEET NO 2

SCALE: 1/8" = 1'-0" AND AS NOTED

DRAWING NO. A14-E-8

D213396



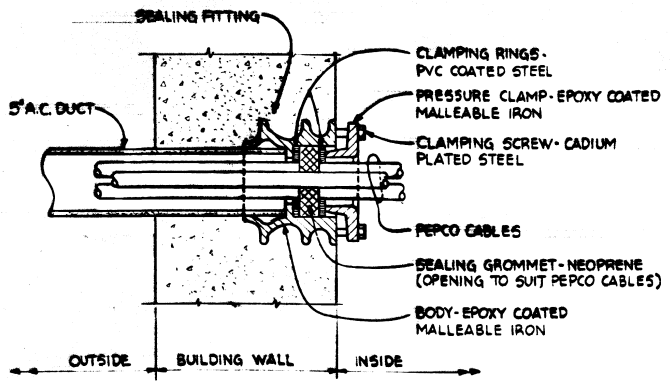
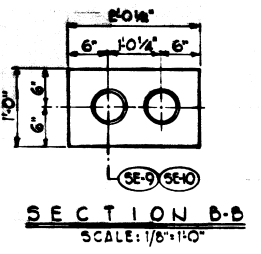
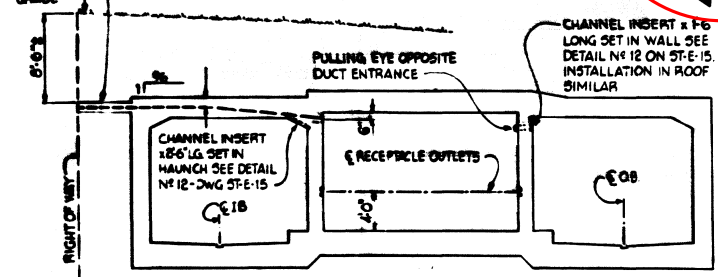
INCOMING PEPCO ELECTRIC SERVICE

3/4" CONDUIT FOR EDGE LIGHTS

3/4" CONDUIT FOR PYLON LIGHTS

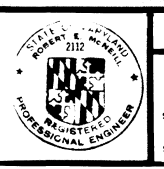
3/4" CONDUIT FOR EDGE LIGHTS

5' x 8' AC DUCTS TO BE ENCASED IN CONCRETE - 5" MIN. COVER. TERMINATE AT R/W WITH PLUGGED COUPLINGS. TERMINATE IN A.C. SWITCHBOARD ROOM WITH SEALING FITTINGS - SEE DETAIL THIS DWG.



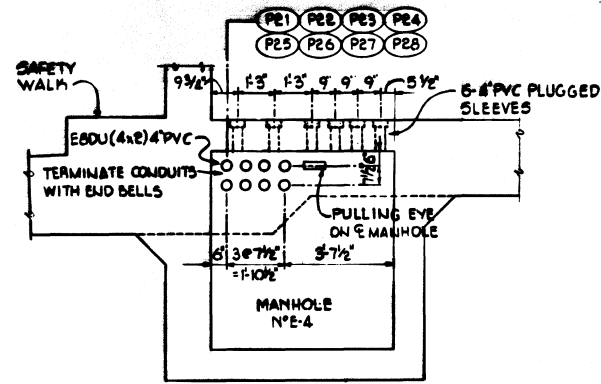
WASHINGTON METROPOLITAN  
 AREA TRANSIT AUTHORITY  
 AS-BUILT CONDITION  
 AUG 31 1981  
 RESIDENT ENGINEER

DESIGNED	DATE	REFERENCE DRAWINGS		REVISIONS	
		NUMBER	DESCRIPTION	DATE	DESCRIPTION
RLD	2-15-77	A4-E-14	GROUNDING - SHEET N° 1	2-25-81	REV PER P.C. 28, AS-BUILT
ALP	2-15-77	A4-E-17	NORTH PLATFORM ELEC.		
RLD	2-15-77	A14-E-24	NORTH SERVICE RMS. - TRAIN CONTROL		
RLD	2-15-77	A14-E-49	ELEC. DETAILS - SHEET N° 5		
RLD	2-15-77	A14-S-19	NORTH SERVICE RMS.		

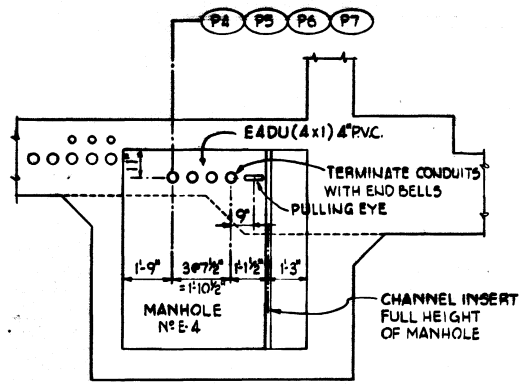


**WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY**  
 BAKER - WIDBERLEY & ASSOCIATES, INC.  
 CONSULTING ENGINEERS  
 SULTON - CAMPBELL & ASSOC. ARCHITECTS  
 Mc NEILL & BALDWIN, INC. MECHANICAL - ELECTRICAL ENGINEERS

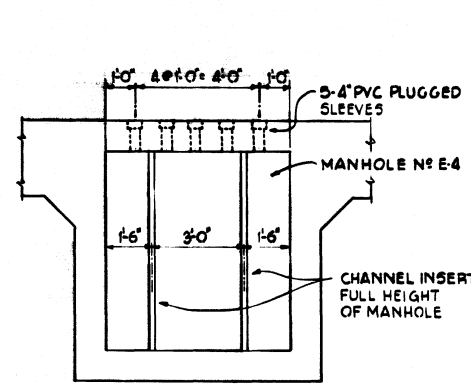
**ROCKVILLE ROUTE  
 WHITE FLINT STATION  
 NORTH SERVICE ROOMS - ELECTRICAL**  
 DE LEUW, CATHER & COMPANY  
 GENERAL ENGINEERING CONSULTANT  
 HARRY WEIBE & ASSOCIATES  
 GENERAL ARCHITECTS  
 SCALE 1/8" = 1'-0" AND AS NOTED  
 DRAWING NO. A14-E-16 M-281-404



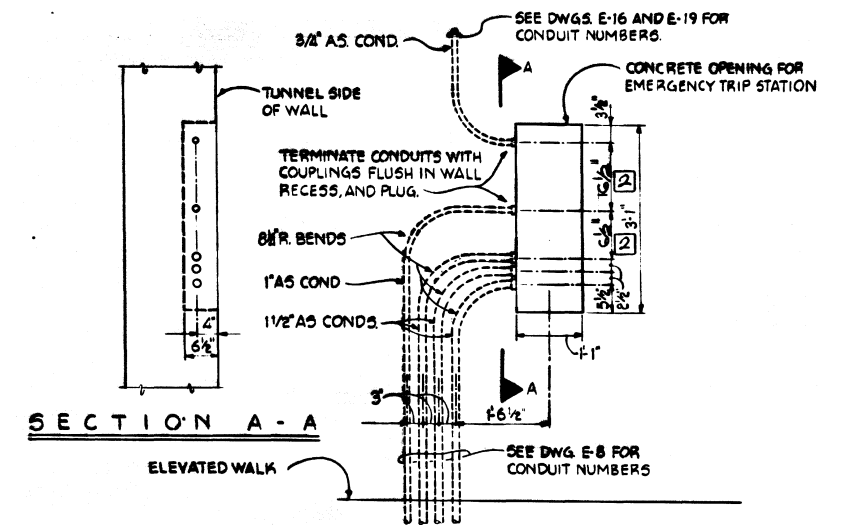
**SECTION A<sub>1</sub> - A<sub>1</sub>**  
SCALE 3/8" = 1'-0"  
E-8



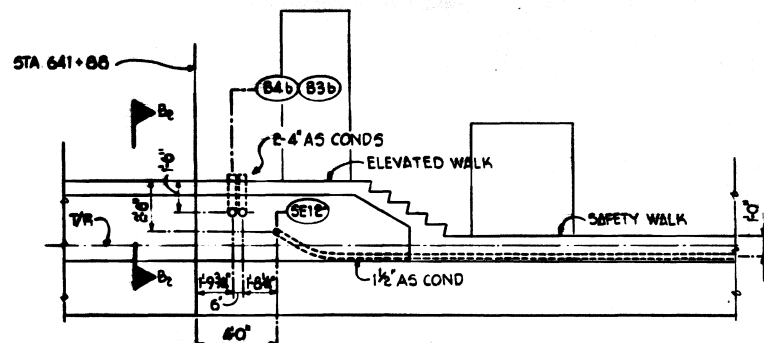
**SECTION A<sub>2</sub> - A<sub>2</sub>**  
SCALE 3/8" = 1'-0"  
E-8



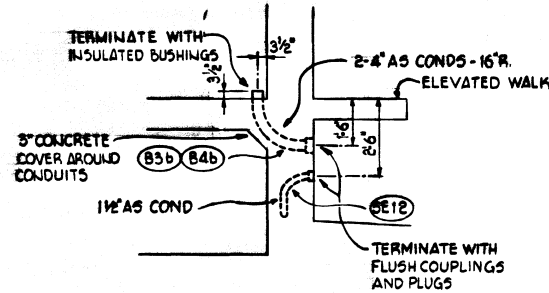
**SECTION A<sub>3</sub> - A<sub>3</sub>**  
SCALE 3/8" = 1'-0"  
E-8



**SECTION A - A**  
ELEVATED WALK  
**DETAIL EMERGENCY TRIP STATIONS**  
FRONT ELEVATION  
SCALE 3/4" = 1'-0"

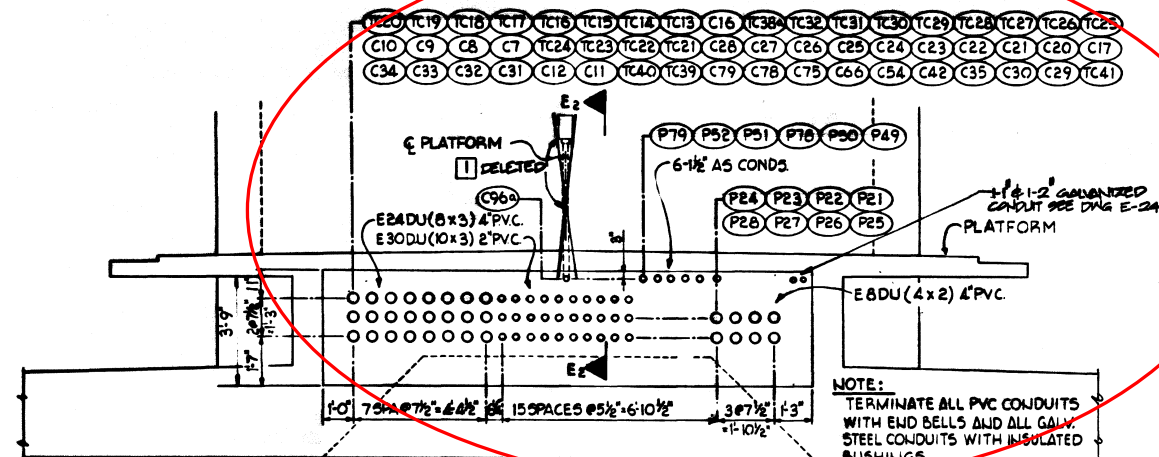


**SECTION B<sub>1</sub> - B<sub>1</sub>**  
SCALE 1/2" = 1'-0"  
E-8

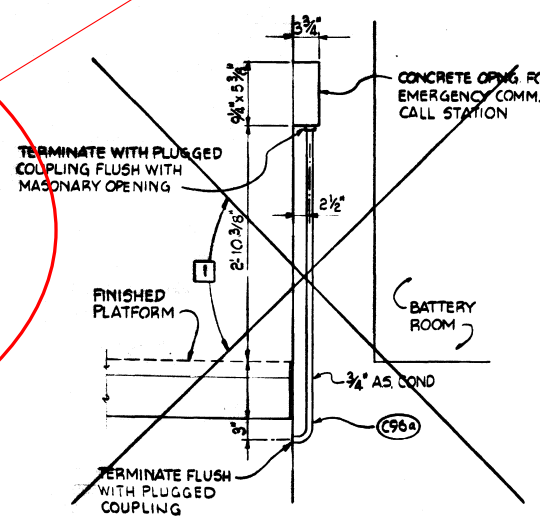


**SECTION B<sub>2</sub> - B<sub>2</sub>**  
SCALE 3/8" = 1'-0"  
E-8

SECTION THROUGH NORTH END OF PLATFORM. IT APPEARS THESE CONDUITS TERMINATE AT PLATFORM END AND EXTEND INTO NORTH SERVICE ROOMS.



**SECTION E<sub>1</sub> - E<sub>1</sub>**  
SCALE 3/8" = 1'-0"  
E-8, E-24



**SECTION E<sub>2</sub> - E<sub>2</sub>**  
SCALE 1" = 1'-0"  
E-8

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY  
**AS-BUILT CONDITION**  
BY: *[Signature]* APR 31 1981  
RESIDENT ENGINEER

DESIGNED	JNL	DATE	2-27-77
DRAWN	ALP	DATE	2-15-77
CHECKED	RCD	DATE	2-23-77
APPROVED	RCD	DATE	2-23-77

NUMBER	DESCRIPTION	DATE	BY
A14-E-8	ELEC. DETAILS - BOX SECTIONS SHEET NO. 2	2-23-77	MD
A14-E-24	NORTH SERVICE RMS - TRAIN CONTROL		

REVISIONS	DESCRIPTION
1	REV. PER PFD 20, AS-BUILT
2	REV. PER FELD COND., AS-BUILT

**WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY**

BAKER - WIBBERLEY & ASSOCIATES, INC.  
CONSULTING ENGINEERS

DE LEUW, CATHER & COMPANY  
GENERAL ENGINEERING CONSULTANT

HARRY WEISS ASSOCIATES  
GENERAL ELECTRICAL CONSULTANT

SULTON - CAMPBELL & ASSOC. ARCHITECTS  
Mc NEILL & BALDWIN, INC. MECHANICAL - ELECTRICAL ENGINEERS

**ROCKVILLE ROUTE**  
**WHITE FLINT STATION**  
**ELECTRICAL DETAILS - SHEET NO. 5**

SCALE AS NOTED

DRAWING NO. A14-E-49 M-281-427

# White Flint Auxiliary Power Load Calculations Summary



General Information/Assumptions		Prepared By: Arora Engineers, Inc. / Pete Driscoll P.E.	
		Arora Proj # 111018.001	
		Submission: Associated with report	
		Date: 1/23/2019	
Rev: 0			
Calculation		VA	Notes
Total Square Footage for Calculation	8200		
Interior Lighting Load for Transportation Building	0.7 VA / Square Foot	5740	per IECC 2015
Exterior Lighting	4 Pole mounted fixtures at 140VA each	560	Estimate based on existing headhouse exterior lighting
<b>Total General Lighting load (continuous)</b>	=====>	<b>7875</b>	per NEC 230.42
<b>General Receptacle load</b>	180VA x 14 receptacles	2520	per NEC 220.14(I)
Total General Receptacle Loads		2520	
General Receptacle Demand Load	1st 10kVA @ 100%	2250	per NEC Table 220.44
	Remainder over 10kVA @ 50%	0	
<b>Total General Receptacle Demand Load</b>	=====>	<b>2250</b>	
<b>General Equipment</b>			
Fare gate	6 units @ 2400VA	14400	Estimated
Fare Vending Machine	10 units @ 1500VA	15000	Estimated
Booth Convenience Receptacle	1 Quad	360	
Control Console	1 unit @ 500 VA	500	Estimated
Booth EWC	1 unit @ 960 VA	960	Estimated
Booth Lighting	2 units @ 70 VA (LED)	140	Estimated
Booth Monitors	2 units @ 350 VA	700	Estimated
Continuous Load *25%	Continuously Load x 25%	335	Per NEC 230.42
<b>Total Traction Power Auxiliary Power Load</b>	=====>	<b>32395</b>	
<b>Mechanical</b>			
Elevator	2 Units @ 20 HP	40000	Estimate
Escalator	4 Units @ 15 HP	60000	Estimate
Heat Pump / Booth AC	1 Units @ 6000 VA	6000	Estimate
Electric Water Heater	1 Unit @4500VA	4500	Estimate
Sump Pump	4 Units @ 0.5 HP	4800	per NEC 430.24
Unit Heater	5 Units @ 5000VA	25000	Estimate
<b>Total HVAC Load</b>	=====>	<b>140300</b>	
<b>Largest Motor Load = Elevator</b>	Largest Motor Load x 25%	10000	per NEC 220.50; 430.24
<b>Total VA</b>		<b>192820</b>	
<b>Voltage (480*1.732)</b>		831	Requires Minimum Service Ampacity of 300A
<b>Total Amps</b>	<b>Total VA / Three Phase Voltage</b>	232	
EXISTING DEMAND NORTH SUBSTATION		50.4	KVA
EXISTING DEMAND SOUTH SUBSTATION		400.0	KVA
EXISTING TOTAL DEMAND		450.4	KVA
EXISTING TOTAL DEMAND +25%		563.0	KVA
PROPOSED CALCULATED DEMAND		232.0	KVA
TOTAL CALCULATED DEMAND		795.0	KVA
TOTAL CALCULATED REQUIRED SERVICE SIZE		956.7	AMPS
Existing Service Size		1600	AMPS

**PROJECT RISK REGISTER (FOR CONCEPTUAL DESIGN)**  
**White Flint Metrorail North Entrance**  
**Rev. 00 - Draft 00**  
**DATE ISSUED: 3/28/19**

**DRAFT**  
**4/26/19**

Categories	
D	Design
C	Construction
R	Real Estate
M	Management
S	Start-Up
<b>CURRENT</b>	

Legend	Low (1)	Med (2)	High (3)	Very High (4)	Significant (5)
Probability	< 10%	10><25%	25><50%	50% ><75%	>75%
Cost	< \$250K	\$250K-<\$1M	\$1M-<\$3M	\$3M-<\$10M	>\$10M
Schedule	< 1 Mths	1 ><3 Mths	3><6 Mths	6><12 Mths	> 12 Mths
Rating	< =6	6.1-18.9		> =19	

Date Added	Category	Risk #	SCC No.	Standard Cost Categories	Risk ID	Risk Identification and Description	Prob p	Cost c	Sched s	Risk Rating p*(c+s)	Mitigation Plan / Status	Current Status	Risk Owner
03/28/19	D	1	40.02	Site Utilities, Utility Relocation	D-1	Unknown utility impacts or relocations required	3	2	4	18	Preliminary engineering will include in depth review of existing utilities and including subsurface investigation to identify utilities	Open	Metro
03/28/19	D	2	50.00	SYSTEMS	D-2	Integration with the existing Metro system	3	4	2	18	Preliminary engineering will include in depth review of the existing systems and conditions	Open	Metro
03/28/19	D	3	80.06	Legal; Permits; Review Fees by other agencies, cities, etc.	D-3	Environmental Permitting	2	1	2	6	Metro to determine impacts based on 30% design.	Open	Metro
03/28/19	D	4	40.04	Environmental mitigation, e.g. wetlands, historical/archeological, parks	D-4	Noise Mitigation	1	1	1	2	Confirm work hours for MOT design such that project complies with local regulations	Open	Metro
03/28/19	D	5	40.03	Haz. mat'l, contam'd soil removal/mitigation, ground water treatments	D-5	Haz-Mat – contaminated soil encountered	1	3	3	6	Team will generate a Hazmat report as part of the final deliverables. Hazmat report will be created per the contract and will define what will be considered additional unforeseen hazardous materials, the process for detecting them, and costs and procedures for removal if additional hazardous materials are found	Open	Metro
03/28/19	D	6	80.09	Project Coordination	D-6	Project phasing and funding coordination with other MOCO priorities - Project phasing with other MOCO priorities at this location including 1) a bridge over the station and 2) new BRT along MD 355	2	3	3	12	Metro coordinates early in design process with MOCO to agree on design interface constraints.	Open	Metro
03/28/19	D	7	40.09	Public Impacts	D-7	Additional community amenities - Community may request additional amenities at station entrance	3	2	1	9	Metro and design team will coordinate early and often with MOCO and other stakeholders to agree on amenities.	Open	Metro
04/23/19	D	8	40.02	Site Utilities, Utility Relocation	D-8	New Storm drain at the Metro platform level cannot be tied into existing track drainage system.	5	2	1	15	Preliminary design phase will need to research a connection to MD 355 via pumping	Open	Metro
04/23/19	D	9	40.02	Site Utilities, Utility Relocation	D-9	Existing sanitary has capacity to support additional sanitary needs (water closets, elevator pumps, etc.)	4	2	2	16	Preliminary design phase will need to research a connection to MD 355 via pumping	Open	Metro
04/23/19	D	10	20.07	Elevators, escalators	D-10	Elevators (machine room-less versus hydraulic)	3	2	2	12	Multiple implications in final design (logistics and approvals)	Open	Metro
04/23/19	D	11	20.01	At-grade station, stop, shelter, mall, terminal, platform	D-11	NFPA 130 Interpretation versus individual AHJs. AHJs approving code applications	2	3	4	14	Metro and design team will coordinate and establish parameters with the AHJ for this improvement during the preliminary design phase	Open	Metro
03/28/19	C	1	40.08	Temporary Facilities and other indirect costs during construction	C-1	Property to the east of the site redevelops or otherwise are unable to obtain for staging (site logistics)	3	3	1	12	During preliminary engineering, Metro will coordinate with adjacent property owner to begin discussion for temporary construction easement/access. Should property not be available, alternative laydown/staging area will be utilized.	Open	Metro
03/28/19	C	2	110.00	SCHEDULE	C-2	Scheduling conflicts with other Metro projects (track time)	3	2	3	15	Metro to begin coordination with design team and other planned project as project moves towards advertisement to ensure minimal conflict	Open	Metro
03/28/19	C	3	80.09	Project Coordination	C-3	Adjacent Construction - project coordination necessary for lane closures, public occupancy permits and site access	3	2	2	12	As project nears final design and project approval, Metro will need to coordinate with MOCO and Maryland State Highway for permits	Open	Metro
03/28/19	C	4	40.09	Public Impacts	C-4	Public Events preventing needed MOT or material delivery	3	1	1	6	Contractor will have to monitor and plan accordingly in construction schedule.	Open	Metro
03/28/19	C	5	10.00	GUIDEWAY & TRACK ELEMENTS	C-5	Impacts to existing Metro facilities from construction (Train Control, Communications, Traction Power, etc.)	2	3	3	12	Plan will be developed by the contractor prior to construction to monitor and maintain existing systems during construction.	Open	Metro
03/28/19	C	6	40.09	Public Impacts	C-6	Passenger Safety Incidents in station	1	1	1	2	Safety plan to be developed by contractor prior to construction	Open	Metro

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**VOB AUTO SALES**

Handler ID: MDR000005983  
11605 OLD GEORGETOWN RD  
ROCKVILLE, MD 20852

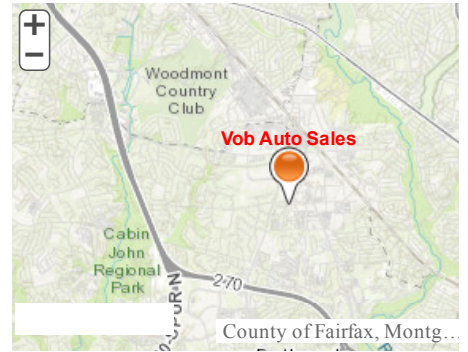
**County Name:** MONTGOMERY

**Latitude:** 39.04899

**Longitude:** -77.11714

**Hazardous Waste Generator:** Small  
Quantity Generator

**Owner Name:** RICHARD A RANKIN



*\*You can navigate within the map with your*

No BIENNIAL REPORT data is available for the facility listed above.

**LIST OF FACILITY CONTACTS**

<u>NAME</u>	<u>STREET</u>	<u>CITY</u>	<u>STATE</u>	<u>ZIP CODE</u>	<u>PHONE</u>	<u>TY CO</u>
HOWARD S PASSMAN	OLD GEORGETOWN RD	ROCKVILLE	MD	20852	301-770- 6100	Pub
HOWARD PASSMAN	OLD GEORGETOWN RD	ROCKVILLE	MD	20852	301-770- 6100	Peri
MARK RHOADES	11605 OLD GEORGETOWN RD	ROCKVILLE	MD	20852	301-770- 6100	Peri

**HANDLER / FACILITY CLASSIFICATION**

Unspecified Universe for the facility listed above.

<u>HANDLER TYPE</u>
Small Quantity Generator

No PROCESS INFORMATION is available for the facility listed above.

**LIST OF NAICS CODES AND DESCRIPTIONS**

<u>NAICS CODE</u>	<u>NAICS DESCRIPTION</u>
81111	AUTOMOTIVE MECHANICAL AND ELECTRICAL REPAIR AND MAINTENANCE

**LIST OF WASTE CODES AND DESCRIPTIONS**

<u>WASTE CODE</u>	<u>WASTE DESCRIPTION</u>
D001	IGNITABLE WASTE
D006	CADMIUM
D008	LEAD
D039	TETRACHLOROETHYLENE

**Total Number of Facilities Retrieved: 1**

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**DRYCLEAN PLUS**

Handler ID: MDP000006048  
11530 E ROCKVILLE PIKE  
ROCKVILLE, MD 20852-0000

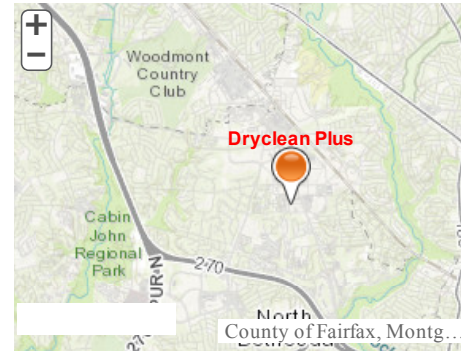
**County Name:** MONTGOMERY

**Latitude:** 39.045971

**Longitude:** -77.1124

**Hazardous Waste Generator:**

**Owner Name:**



*\*You can navigate within the map with your*

**No BIENNIAL REPORT data is available for the facility listed above.**

**LIST OF FACILITY CONTACTS**

<u>NAME</u>	<u>STREET</u>	<u>CITY</u>	<u>STATE</u>	<u>ZIP CODE</u>	<u>PHONE</u>	<u>TYPE OF CONTACT</u>
HYEON T KIM					301-231-9445	Public
HYEON T KIM					301-231-9445	Permit

**HANDLER / FACILITY CLASSIFICATION**

**Unspecified Universe for the facility listed above.**

**No Handler information is available for the facility listed above.**

**No PROCESS INFORMATION is available for the facility listed above.**

**LIST OF NAICS CODES AND DESCRIPTIONS**

<u>NAICS CODE</u>	<u>NAICS DESCRIPTION</u>
81232	DRYCLEANING AND LAUNDRY SERVICES (EXCEPT COIN-OPERATED)

**No Waste Codes are available for the facility listed above.**

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**JAGUAR BETHESDA - LAND ROVER  
BETHESDA**

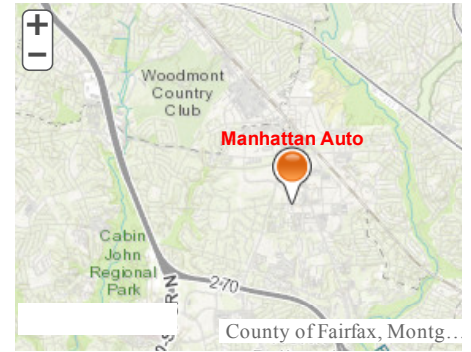
Handler ID: MDD024258154  
11617 OLD GEORGETOWN RD  
NORTH BETHESDA, MD 20852

**County Name:** MONTGOMERY

**Latitude:** 39.04927  
**Longitude:** -77.11564

**Hazardous Waste Generator:**  
Conditionally Exempt Small Quantity  
Generator

**Owner Name:** BETHESDA LUXURY  
IMPORTS, LLC



*\*You can navigate within the map with your*

**No BIENNIAL REPORT data is available for the facility listed above.**

**LIST OF FACILITY CONTACTS**

<u>NAME</u>	<u>STREET</u>	<u>CITY</u>	<u>STATE</u>	<u>ZIP CODE</u>	<u>PHONE</u>	<u>TYI CO</u>
MARY BLAISDELL	11617 OLD GEORGETOWN RD	NORTH BETHESDA	MD	20852	301-483- 7862	Pub
DAVID BOHN	OLD GEORGETOWN RD	ROCKVILLE	MD	20852	301-424- 7000, 260	Perr
PETER E VOLSKE	11617 OLD GEORGETOWN RD	ROCKVILLE	MD	20852	301-424- 7000	Perr
DAVID BOHN	11617 OLD GEORGETOWN RD	ROCKVILLE	MD	20852	301-424- 7000, 260	Perr
MARY BLAISDELL	11617 OLD GEORGETOWN RD	NORTH BETHESDA	MD	20852	301-483- 7862	Perr

**HANDLER / FACILITY CLASSIFICATION**

**Unspecified Universe for the facility listed above.**

<u>HANDLER TYPE</u>
Conditionally Exempt Small Quantity Generator

**No PROCESS INFORMATION is available for the facility listed above.**



**LIST OF NAICS CODES AND DESCRIPTIONS**

<u>NAICS CODE</u>	<u>NAICS DESCRIPTION</u>
441110	NEW CAR DEALERS
44111	NEW CAR DEALERS

**LIST OF WASTE CODES AND DESCRIPTIONS**

<u>WASTE CODE</u>	<u>WASTE DESCRIPTION</u>
D001	IGNITABLE WASTE
D003	REACTIVE WASTE
D005	BARIUM
D018	BENZENE
F003	THE FOLLOWING SPENT NONHALOGENATED SOLVENTS: XYLENE, ACETON ACETATE, ETHYL BENZENE, ETHYL ETHER, METHYL ISOBUTYL KETONE, N ALCOHOL, CYCLOHEXANONE, AND METHANOL; ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, ONLY THE ABOVE SPENT NONHALOGENATED SOLVENTS; AND ALL SPENT SOLVENT MIXTURES/BLEND CONTAINING, BEFORE USE, ONE OR MORE OF THE ABOVE NONHALOGENATED SOLVENTS, AND A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THOSE SOLVENTS LISTED IN F001, F002, F004, AND F005; AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.
F005	THE FOLLOWING SPENT NONHALOGENATED SOLVENTS: TOLUENE, METHYL KETONE, CARBON DISULFIDE, ISOBUTANOL, PYRIDINE, BENZENE, 2-ETHOXYETHANOL, AND 2-NITROPROPANE; ALL SPENT SOLVENT MIXTURE CONTAINING, BEFORE USE, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) ONE OR MORE OF THE ABOVE NONHALOGENATED SOLVENTS OR THOSE SOLVENTS LISTED IN F001, F002, OR F004; AND STILL BOTTOMS FROM THE RECOVERY OF SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.

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**CHARLES TOYOTA SPECIALISTS**

Handler ID: MDD985416403  
12122 NEBEL ST  
ROCKVILLE, MD 20852

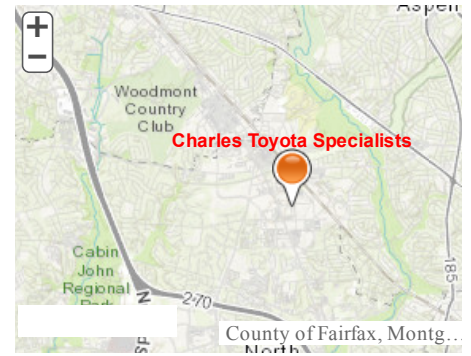
**County Name:** MONTGOMERY

**Latitude:** 39.051504

**Longitude:** -77.109867

**Hazardous Waste Generator:** Small  
Quantity Generator

**Owner Name:** CHARLES BENSON



*\*You can navigate within the map with your*

No BIENNIAL REPORT data is available for the facility listed above.

**LIST OF FACILITY CONTACTS**

<u>NAME</u>	<u>STREET</u>	<u>CITY</u>	<u>STATE</u>	<u>ZIP CODE</u>	<u>PHONE</u>	<u>TYPE C CONTA</u>
CHARLES BENSON	12122 NEBEL ST	ROCKVILLE	MD	20852	301-468- 8899	Public
CHARLES BENSON	12122 NEBEL ST	ROCKVILLE	MD	20852	301-468- 8899	Permit

**HANDLER / FACILITY CLASSIFICATION**

Unspecified Universe for the facility listed above.

<u>HANDLER TYPE</u>
Small Quantity Generator

No PROCESS INFORMATION is available for the facility listed above.

No NAICS Codes are available for the facility listed above.

**LIST OF WASTE CODES AND DESCRIPTIONS**

<u>WASTE CODE</u>	<u>WASTE DESCRIPTION</u>
D001	IGNITABLE WASTE
D008	LEAD
D018	BENZENE
D039	TETRACHLOROETHYLENE

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Total Number of Facilities Retrieved: 1

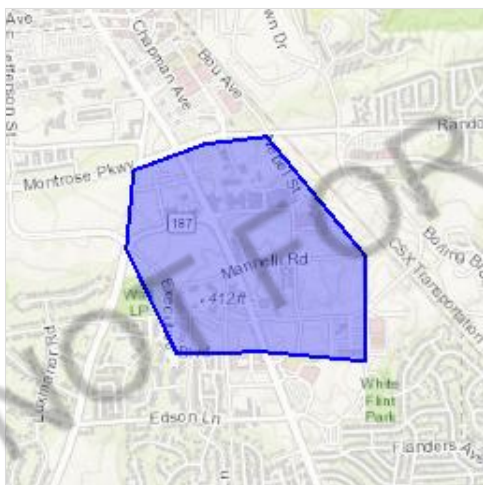
# IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

## Location

Montgomery County, Maryland



## Local office

Chesapeake Bay Ecological Services Field Office

☎ (410) 573-4599

📠 (410) 266-9127

177 Admiral Cochrane Drive  
Annapolis, MD 21401-7307

<http://www.fws.gov/chesapeakebay/>

<http://www.fws.gov/chesapeakebay/endsppweb/ProjectReview/Index.html>

# Endangered species

**This resource list is for informational purposes only and does not constitute an analysis of project level impacts.**

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species<sup>1</sup> and their critical habitats are managed by the [Ecological Services Program](#) of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries<sup>2</sup>).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact [NOAA Fisheries](#) for [species under their jurisdiction](#).

- 
1. Species listed under the [Endangered Species Act](#) are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the [listing status page](#) for more information.
  2. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

THERE ARE NO ENDANGERED SPECIES EXPECTED TO OCCUR AT THIS LOCATION.

# Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act<sup>1</sup> and the Bald and Golden Eagle Protection Act<sup>2</sup>.

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described [below](#).

1. The [Migratory Birds Treaty Act](#) of 1918.
2. The [Bald and Golden Eagle Protection Act](#) of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern <http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php>
- Measures for avoiding and minimizing impacts to birds <http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php>
- Nationwide conservation measures for birds <http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf>

The birds listed below are birds of particular concern either because they occur on the [USFWS Birds of Conservation Concern](#) (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ [below](#). This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the [E-bird data mapping tool](#) (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found [below](#).

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME

BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE.

"BREEDS ELSEWHERE" INDICATES  
THAT THE BIRD DOES NOT LIKELY  
BREED IN YOUR PROJECT AREA.)

**Bald Eagle** *Haliaeetus leucocephalus*

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.

<https://ecos.fws.gov/ecp/species/1626>

Breeds Sep 1 to Jul 31

**Blue-winged Warbler** *Vermivora pinus*

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Breeds May 1 to Jun 30

**Cerulean Warbler** *Dendroica cerulea*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/2974>

Breeds Apr 28 to Jul 20

**Kentucky Warbler** *Oporornis formosus*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Breeds Apr 20 to Aug 20

**Prairie Warbler** *Dendroica discolor*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Breeds May 1 to Jul 31

**Prothonotary Warbler** *Protonotaria citrea*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Breeds Apr 1 to Jul 31

**Red-headed Woodpecker** *Melanerpes erythrocephalus*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Breeds May 10 to Sep 10

**Rusty Blackbird** *Euphagus carolinus*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Breeds elsewhere

**Wood Thrush** *Hylocichla mustelina*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Breeds May 10 to Aug 31

## Probability of Presence Summary



The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ “Proper Interpretation and Use of Your Migratory Bird Report” before using or attempting to interpret this report.

### Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is  $0.25/0.25 = 1$ ; at week 20 it is  $0.05/0.25 = 0.2$ .
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

### Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

### Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

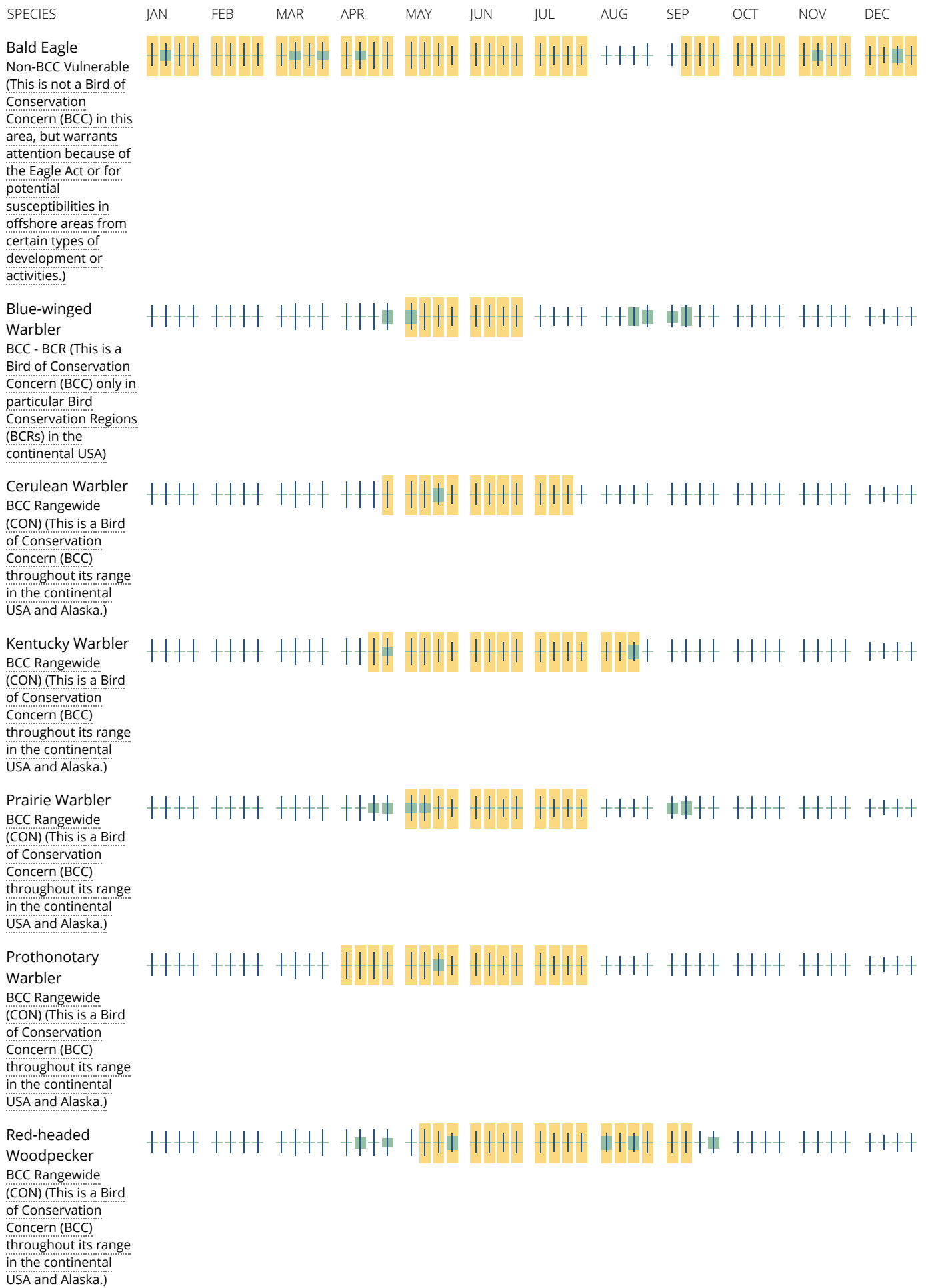
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

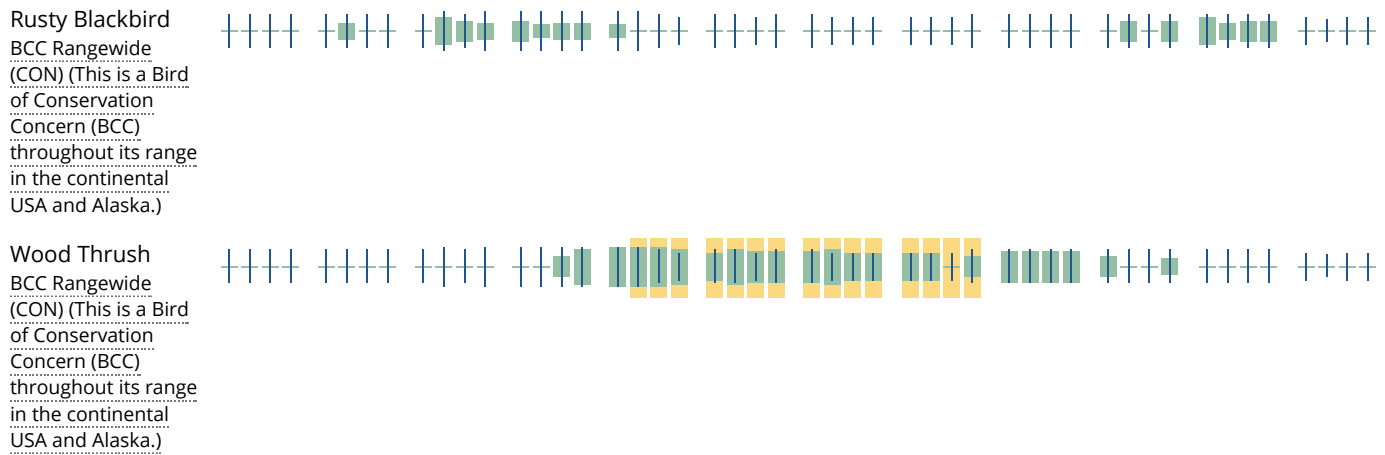
### No Data (—)

A week is marked as having no data if there were no survey events for that week.

### Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.





**Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.**

[Nationwide Conservation Measures](#) describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. [Additional measures](#) and/or [permits](#) may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

**What does IPaC use to generate the migratory birds potentially occurring in my specified location?**

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [E-bird Explore Data Tool](#).

**What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?**

The probability of presence graphs associated with your migratory bird list are based on data provided by the [Avian Knowledge Network \(AKN\)](#). This data is derived from a growing collection of [survey, banding, and citizen science datasets](#).

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

**How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?**

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: [The Cornell Lab of Ornithology All About Birds Bird Guide](#), or (if you are unsuccessful in locating the bird of interest there), the [Cornell Lab of Ornithology Neotropical Birds](#)

[guide](#). If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

### What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are [Birds of Conservation Concern](#) (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the [Eagle Act](#) requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

### Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the [NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf](#) project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the [Diving Bird Study](#) and the [nanotag studies](#) or contact [Caleb Spiegel](#) or [Pam Loring](#).

### What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to [obtain a permit](#) to avoid violating the Eagle Act should such impacts occur.

### Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid

or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

## Facilities

### National Wildlife Refuge lands

Any activity proposed on lands managed by the [National Wildlife Refuge](#) system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

### Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

## Wetlands in the National Wetlands Inventory

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESHWATER POND

[PUBHh](#)

A full description for each wetland code can be found at the [National Wetlands Inventory website](#)

#### Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error

is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

### **Data exclusions**

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tubercid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

### **Data precautions**

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

Medusa, Maryland's Cultural Resource Information System

Maryland Inventory of Historic Properties  
(Architectural Inventory)

Search | Map | Reports | Back

Log In

**General Information**

Inventory Number: M: 30-34

Name: White Flint Metrorail Station

Other Names:

Documentation Status: No Documentation on File

No longer extant

**Scanned Forms**

Documentation Not Received

Last Scan:

Additional Info in Survey File

**About the Resource**

Comments:

See Also:

**Address Information**

Address: 5500 Marinelli Road

Town: Rockville

Zip Code: 20852

Counties: Montgomery

USGS Quad(s): Kensington

**Related Records**

*Click on hyperlink to go to related record*

- NRHP No NRHP Records
- Easement No Easement Records
- DOE No DOE Records

**GIS/Map/Other Information**

In map-based Medusa?:

Map Layer: Pending Submittal

**Historic or Survey District Information**



Within NR listed or eligible district:

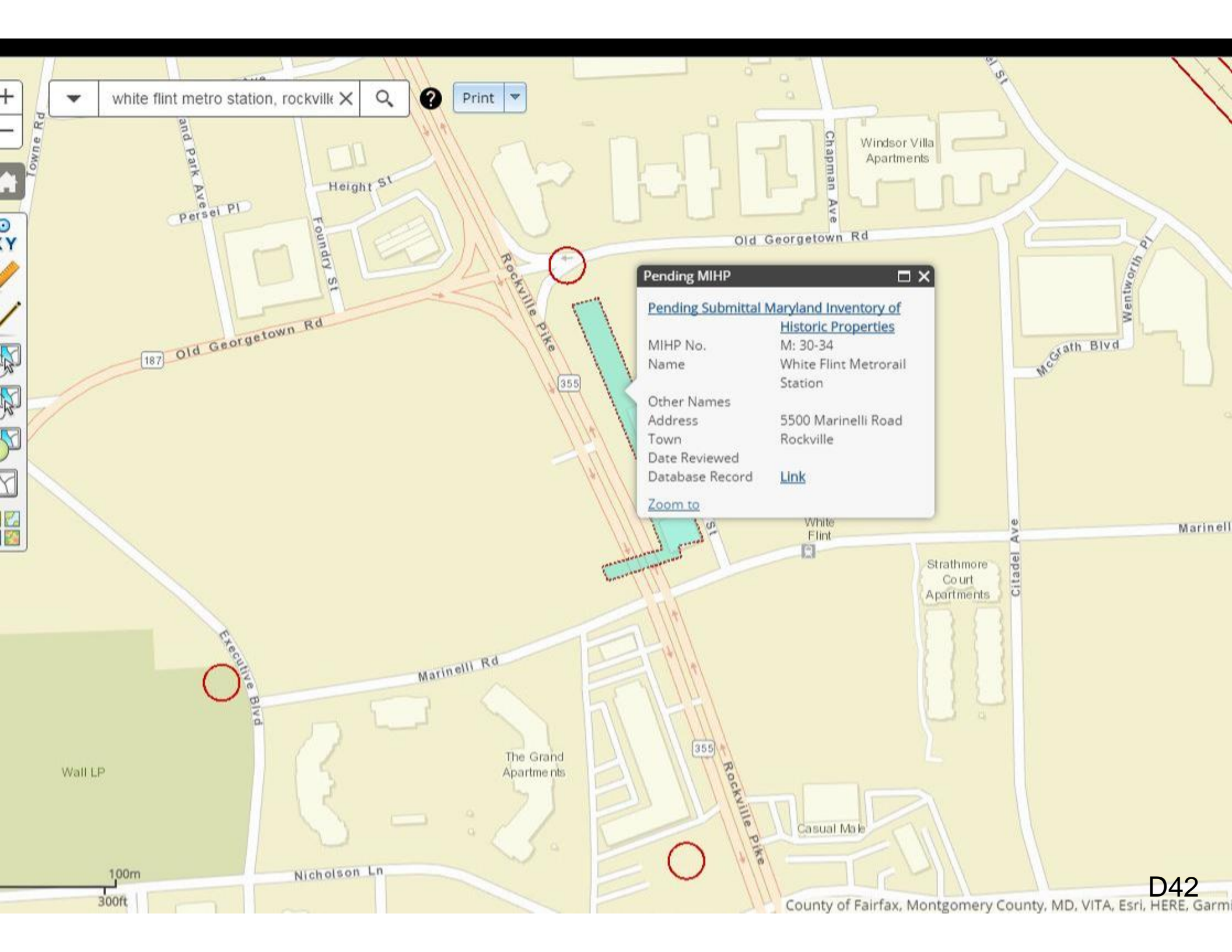
Within Survey District:

Material in Vertical File?:

*Please note that some material is only available at the MHT Library in Crownsville, MD. This includes architectural reports (such as historic structures reports, and additional miscellaneous notes in the vertical files. Although scanned versions of the forms are available (see the "Open Scanned Inventory Form" link), consultants may also want to see the prints of photographs, etc. The presence of unscanned material is noted with a check in "Additional Info in Survey File," above).*

**Database Entry Information**

Date Record Entered: 7/11/2018



white flint metro station, rockville X

Print

### Pending MIHP

#### [Pending Submittal Maryland Inventory of Historic Properties](#)

MIHP No.	M: 30-34
Name	White Flint Metrorail Station
Other Names	
Address	5500 Marinelli Road
Town	Rockville
Date Reviewed	
Database Record	<a href="#">Link</a>

[Zoom to](#)

Windsor Villa Apartments

Strathmore Court Apartments

The Grand Apartments

Casual Male



# Maryland Historical Trust

## State Historic Sites Inventory Form

### 1. Name (indicate preferred name)

historic

and/or common Rainbow Motel

### 2. Location

street & number 11520 Rockville Pike  not for publicationcity, town Rockville  vicinity of congressional district 4thstate Maryland county Montgomery

### 3. Classification

Category	Ownership	Status	Present Use	
<input type="checkbox"/> district	<input type="checkbox"/> public	<input type="checkbox"/> occupied	<input type="checkbox"/> agriculture	<input type="checkbox"/> museum
<input type="checkbox"/> building(s)	<input checked="" type="checkbox"/> private	<input type="checkbox"/> unoccupied	<input checked="" type="checkbox"/> commercial	<input type="checkbox"/> park
<input type="checkbox"/> structure	<input type="checkbox"/> both	<input type="checkbox"/> work in progress	<input type="checkbox"/> educational	<input type="checkbox"/> private residence
<input type="checkbox"/> site	<b>Public Acquisition</b>	<b>Accessible</b>	<input type="checkbox"/> entertainment	<input type="checkbox"/> religious
<input type="checkbox"/> object	<input type="checkbox"/> in process	<input checked="" type="checkbox"/> yes: restricted	<input type="checkbox"/> government	<input type="checkbox"/> scientific
	<input type="checkbox"/> being considered	<input type="checkbox"/> yes: unrestricted	<input type="checkbox"/> industrial	<input type="checkbox"/> transportation
	<input type="checkbox"/> not applicable	<input type="checkbox"/> no	<input type="checkbox"/> military	<input type="checkbox"/> other:

### 4. Owner of Property (give names and mailing addresses of all owners)

name Green Acres Corp.

street &amp; number telephone no.:

city, town state and zip code

### 5. Location of Legal Description

courthouse, registry of deeds, etc. Montgomery County Courthouse liber 2247street & number folio 46city, town Rockville state Maryland

### 6. Representation in Existing Historical Surveys

title MnCPPC Historic Sites Inventorydate 1976  federal  state  county  localpository for survey records Park Historian's Officecity, town Rockville state Maryland

# 7 DESCRIPTION

M:30-10

## CONDITION

EXCELLENT  
 GOOD  
 FAIR

DETERIORATED  
 RUINS  
 UNEXPOSED

## CHECK ONE

UNALTERED  
 ALTERED

## CHECK ONE

ORIGINAL SITE  
 MOVED DATE \_\_\_\_\_

---

### DESCRIBE THE PRESENT AND ORIGINAL (IF KNOWN) PHYSICAL APPEARANCE

This is a massive, two-story frame structure, with several adjoining wings, etc. The main block is a hip-roofed, three-bay section that faces east. An imposing, two-story, pedimented portico projects from the center section. There is a central door here, that is flanked on each side by large, 6/6 windows. The other bays also have large, 6/6 windows.

A massive brick chimney stack exits from this slope of the roof, south-of-center. The north and south end slopes feature double dormers. To the SW rear, is a slightly-lower wing of similar design. All in all, an imposing edifice left over from the early-20th Century Rockville Pike "estate era." Now used as a rather seedy-looking motel.

CONTINUE ON SEPARATE SHEET IF NECESSARY

# 8. Significance

Survey No.

M:30-10

Period	Areas of Significance—Check and justify below			
<input type="checkbox"/> prehistoric	<input type="checkbox"/> archeology-prehistoric	<input type="checkbox"/> community planning	<input type="checkbox"/> landscape architecture	<input type="checkbox"/> religion
<input type="checkbox"/> 1400-1499	<input type="checkbox"/> archeology-historic	<input type="checkbox"/> conservation	<input type="checkbox"/> law	<input type="checkbox"/> science
<input type="checkbox"/> 1500-1599	<input type="checkbox"/> agriculture	<input type="checkbox"/> economics	<input type="checkbox"/> literature	<input type="checkbox"/> sculpture
<input type="checkbox"/> 1600-1699	<input checked="" type="checkbox"/> architecture	<input type="checkbox"/> education	<input type="checkbox"/> military	<input type="checkbox"/> social/
<input type="checkbox"/> 1700-1799	<input type="checkbox"/> art	<input type="checkbox"/> engineering	<input type="checkbox"/> music	<input type="checkbox"/> humanitarian
<input type="checkbox"/> 1800-1899	<input type="checkbox"/> commerce	<input type="checkbox"/> exploration/settlement	<input type="checkbox"/> philosophy	<input type="checkbox"/> theater
<input type="checkbox"/> 1900-	<input type="checkbox"/> communications	<input type="checkbox"/> industry	<input type="checkbox"/> politics/government	<input type="checkbox"/> transportation
		<input type="checkbox"/> invention		<input type="checkbox"/> other (specify)

**Specific dates**    circa. 1902    **Builder/Architect**

---

check: Applicable Criteria:       A       B       C       D  
and/or  
Applicable Exception:       A       B       C       D       E       F       G

Level of Significance:       national       state       local

Prepare both a summary paragraph of significance and a general statement of history and support.

The Rainbow Motel is significant as an example of "Estate" style architecture popularly built during the early part of the twentieth century. The house is believed to have been built about 1902 for Herman and Lucia Hollerith.<sup>1</sup> The house was built on 7.94 acres of land referred to as "Addition to Wilson's Discovery" and "Dann" which the Holleriths purchased in April of 1901 from Harry W. Blunt, Jr.<sup>2</sup>

In October of 1912, the Holleriths sold the house to Morgan and Grace Beach.<sup>3</sup> The Beaches lived in the house until 1926 when they sold it to Frank Abbo.<sup>4</sup> The house then became the "Villa Roma Club" or "Roma Gardens."<sup>5</sup> Villa Roma was a club and a restaurant featuring dinner, dancing and live entertaining (Kate Smith sang here before she made it big). The club had a fourteen piece band and brought in live entertainers. People who recall going there say that it was "really something" and it was all there was in the way of dining and entertainment between Rockville and Bethesda. Unfortunately, when the banks closed down during the depression, Frank Abbo lost the club.<sup>6</sup>

In 1934, Frank defaulted on the mortgage and the house was sold by a court appointed trustee. The property was then described as located on the Rockville Pike, about 3 miles from Rockville. It was improved by a three story dwelling of about fourteen rooms, four baths, cellar, hot water heat, electric lights and an artesian well. The house was surrounded by shade trees and had a "macadam" driveway from Rockville Pike to the house. Also on the property were three outbuildings used as servants quarters, a barn, garage and stable combined, an engine house and other outbuildings as well as an orchard.<sup>7</sup> The house was sold to Lucia B. Hollerith, widow, in May.<sup>8</sup>

In April of 1936, Lucia sold the house to Frank and Gwendolyn Davis.<sup>9</sup> They sold it in July of 1948 and it is now the property of Green Acres Corporation.<sup>10</sup> It is presently used as the rather run-down Rainbow Motel.

see attachment sheet A for footnotes

## Attachment Sheet A

<sup>1</sup>The date given is based on the date that the land was purchased and the date that it first appears on the tax records with substantial improvements (the improvements listed jumped from \$425 in value in 1901 to \$8,500 in 1902).

- <sup>2</sup>Deed TD 17/77, Mont. Co. Land Records.
- <sup>3</sup>Deed 234/452, " "
- <sup>4</sup>Deed 402/210, " "
- <sup>5</sup>Equity #7081, 68/178, Mont. Co. Judgement Records.
- <sup>6</sup>Conversation with Robert Abbo, son of Frank Abbo, deceased, 1/83.
- <sup>7</sup>Equity #7081, 68/178, Mont. Co. Judgement Records.
- <sup>8</sup>Deed 572/248, Mont. Co. Land Records.
- <sup>9</sup>Deed 624/28, " "
- <sup>10</sup>Deed 2247/46, " "

## 9. Major Bibliographical References

Survey No. M:30-10

Mont. Co. Land Records  
Mont. Co. Judgement Records  
Conversation with Robert Abbo, 1/83

## 10. Geographical Data

Acreage of nominated property 43,560 sq. ft.

Quadrangle name \_\_\_\_\_

Quadrangle scale \_\_\_\_\_

UTM References do NOT complete UTM references

A	<input type="text"/>	<input type="text"/>	<input type="text"/>
	Zone	Easting	Northing

B	<input type="text"/>	<input type="text"/>	<input type="text"/>
	Zone	Easting	Northing

C	<input type="text"/>	<input type="text"/>	<input type="text"/>
---	----------------------	----------------------	----------------------

D	<input type="text"/>	<input type="text"/>	<input type="text"/>
---	----------------------	----------------------	----------------------

E	<input type="text"/>	<input type="text"/>	<input type="text"/>
---	----------------------	----------------------	----------------------

F	<input type="text"/>	<input type="text"/>	<input type="text"/>
---	----------------------	----------------------	----------------------

G	<input type="text"/>	<input type="text"/>	<input type="text"/>
---	----------------------	----------------------	----------------------

H	<input type="text"/>	<input type="text"/>	<input type="text"/>
---	----------------------	----------------------	----------------------

Verbal boundary description and justification

List all states and counties for properties overlapping state or county boundaries

state	code	county	code
-------	------	--------	------

state	code	county	code
-------	------	--------	------

## 11. Form Prepared By

name/title Catherine Crawfordorganization M.C. Hist. Preservation Comm. date 1/83

street &amp; number \_\_\_\_\_ telephone \_\_\_\_\_

city or town Rockville state Maryland

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The survey and inventory are being prepared for information and record purposes only and do not constitute any infringement of individual property rights.

return to: Maryland Historical Trust  
Shaw House  
21 State Circle  
Annapolis, Maryland 21401  
(301) 269-2438

PS-2746

D47

INVENTORY FORM FOR STATE HISTORIC SITES SURVEY

**1 NAME**

HISTORIC  
O'Donoghue Estate?

AND/OR COMMON  
Rainbow Motel

**2 LOCATION**

STREET & NUMBER  
NW Corner of Rockville Pike & Wall Lane

CITY, TOWN  
Rockville

CONGRESSIONAL DISTRICT

STATE  
Maryland

COUNTY  
Montgomery

**3 CLASSIFICATION**

CATEGORY	OWNERSHIP	STATUS	PRESENT USE
<input checked="" type="checkbox"/> DISTRICT	<input type="checkbox"/> PUBLIC	<input checked="" type="checkbox"/> OCCUPIED	<input type="checkbox"/> AGRICULTURE
<input checked="" type="checkbox"/> BUILDING(S)	<input checked="" type="checkbox"/> PRIVATE	<input type="checkbox"/> UNOCCUPIED	<input checked="" type="checkbox"/> COMMERCIAL
<input type="checkbox"/> STRUCTURE	<input type="checkbox"/> BOTH	<input type="checkbox"/> WORK IN PROGRESS	<input type="checkbox"/> MUSEUM
<input type="checkbox"/> SITE	<b>PUBLIC ACQUISITION</b>	<input checked="" type="checkbox"/> ACCESSIBLE	<input type="checkbox"/> PARK
<input type="checkbox"/> OBJECT	<input type="checkbox"/> IN PROCESS	<input type="checkbox"/> YES: RESTRICTED	<input type="checkbox"/> EDUCATIONAL
	<input type="checkbox"/> BEING CONSIDERED	<input type="checkbox"/> YES: UNRESTRICTED	<input type="checkbox"/> ENTERTAINMENT
		<input type="checkbox"/> NO	<input type="checkbox"/> GOVERNMENT
			<input type="checkbox"/> INDUSTRIAL
			<input type="checkbox"/> MILITARY
			<input type="checkbox"/> OTHER:

**4 OWNER OF PROPERTY**

NAME  
Rainbow Motel Corp.

Telephone #:

STREET & NUMBER

CITY, TOWN

STATE, zip code

**5 LOCATION OF LEGAL DESCRIPTION**

COURTHOUSE,  
REGISTRY OF DEEDS, ETC. Montgomery County Courthouse

Liber #:  
Folio #:

STREET & NUMBER

CITY, TOWN  
Rockville

STATE  
Maryland

**6 REPRESENTATION IN EXISTING SURVEYS**

TITLE

DATE

DEPOSITORY FOR SURVEY RECORDS

CITY, TOWN

STATE

FEDERAL  STATE  COUNTY  LOCAL

# 7 DESCRIPTION

M:30-10

## CONDITION

EXCELLENT  
 GOOD  
 FAIR

DETERIORATED  
 RUINS  
 UNEXPOSED

## CHECK ONE

UNALTERED  
 ALTERED

## CHECK ONE

ORIGINAL SITE  
 MOVED      DATE \_\_\_\_\_

### DESCRIBE THE PRESENT AND ORIGINAL (IF KNOWN) PHYSICAL APPEARANCE

This is a massive, two-story frame structure, with several adjoining wings, etc. The main block is a hip-roofed, three-bay section that faces east. An imposing, two-story, pedimented portico projects from the center section. There is a central door here, that is flanked on each side by large, 6/6 windows. The other bays also have large, 6/6 windows.

A massive brick chimney stack exits from this slope of the roof, south-of-center. The north and south end slopes feature double dormers. To the SW rear, is a slightly-lower wing of similar design. All in all, an imposing edifice left over from the early-20th Century Rockville Pike "estate era." Now used as a rather seedy-looking motel.

CONTINUE ON SEPARATE SHEET IF NECESSARY

**8 SIGNIFICANCE**

M:30-10

<b>PERIOD</b>	<b>AREAS OF SIGNIFICANCE -- CHECK AND JUSTIFY BELOW</b>			
<input type="checkbox"/> PREHISTORIC	<input type="checkbox"/> ARCHEOLOGY-PREHISTORIC	<input type="checkbox"/> COMMUNITY PLANNING	<input type="checkbox"/> LANDSCAPE ARCHITECTURE	<input type="checkbox"/> RELIGION
<input type="checkbox"/> 1400-1499	<input type="checkbox"/> ARCHEOLOGY-HISTORIC	<input type="checkbox"/> CONSERVATION	<input type="checkbox"/> LAW	<input type="checkbox"/> SCIENCE
<input type="checkbox"/> 1500-1599	<input type="checkbox"/> AGRICULTURE	<input type="checkbox"/> ECONOMICS	<input type="checkbox"/> LITERATURE	<input type="checkbox"/> SCULPTURE
<input type="checkbox"/> 1600-1699	<input type="checkbox"/> ARCHITECTURE	<input type="checkbox"/> EDUCATION	<input type="checkbox"/> MILITARY	<input type="checkbox"/> SOCIAL/HUMANITARIAN
<input type="checkbox"/> 1700-1799	<input type="checkbox"/> ART	<input type="checkbox"/> ENGINEERING	<input type="checkbox"/> MUSIC	<input type="checkbox"/> THEATER
<input type="checkbox"/> 1800-1899	<input type="checkbox"/> COMMERCE	<input type="checkbox"/> EXPLORATION/SETTLEMENT	<input type="checkbox"/> PHILOSOPHY	<input type="checkbox"/> TRANSPORTATION
<input checked="" type="checkbox"/> 1900-	<input type="checkbox"/> COMMUNICATIONS	<input type="checkbox"/> INDUSTRY	<input type="checkbox"/> POLITICS/GOVERNMENT	<input type="checkbox"/> OTHER (SPECIFY)
		<input type="checkbox"/> INVENTION		

SPECIFIC DATES

BUILDER/ARCHITECT

STATEMENT OF SIGNIFICANCE

CONTINUE ON SEPARATE SHEET IF NECESSARY



# 9 MAJOR BIBLIOGRAPHICAL REFERENCES

M:30-10

CONTINUE ON SEPARATE SHEET IF NECESSARY

## 10 GEOGRAPHICAL DATA

ACREAGE OF NOMINATED PROPERTY \_\_\_\_\_

VERBAL BOUNDARY DESCRIPTION

LIST ALL STATES AND COUNTIES FOR PROPERTIES OVERLAPPING STATE OR COUNTY BOUNDARIES

STATE \_\_\_\_\_ COUNTY \_\_\_\_\_

STATE \_\_\_\_\_ COUNTY \_\_\_\_\_

## 11 FORM PREPARED BY

NAME / TITLE

Michael F. Dwyer, Senior Park Historian

ORGANIZATION

M-NCPPC

DATE

5/14/75

STREET & NUMBER

8787 Georgia Ave.

TELEPHONE

589-1480

CITY OR TOWN

Silver Spring

STATE

Maryland

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The Survey and Inventory are being prepared for information and record purposes only and do not constitute any infringement of individual property rights.

RETURN TO: Maryland Historical Trust  
The Shaw House, 21 State Circle  
Annapolis, Maryland 21401  
(301) 267-1438



D52

NAME

ROCKVILLE PIKE ESTATES  
(NOW RAINBOW MOTEL)

LOCATION ROCKVILLE PIKE + WALL LANE, ROCKVILLE, MA

FACADE S

M: 30-10

PHOTO TAKEN 5/14/75  
M. DWYER

Property Address <u>11609 Rockville Pike, Rockville, Montgomery County, MD</u>
Owner Name/Address <u>Warren K. Montouri trustees, 11609 Rockville Pike, Rockville, MD</u>
Year Built <u>circa 1920</u>

**Description:**

The Montouri Estate, constructed circa 1920, was previously surveyed by Maryland-National Capital Park and Planning Commission in 1975. Since the time of the previous survey, the main house has been demolished. Not mentioned in the prior inventory form is a 1½-story garage/carriage house which is still extant. Constructed circa 1920, the outbuilding has a front-gable roof, wood siding and a brick foundation. The roof is covered with wood shingles and has an open cornice. On the east elevation is a 1-story, shed roof addition containing two windows covered with plywood. The south elevation has a single doorway, a double door and two window openings on the first story, all covered with plywood. The second story of the south elevation has a wood 6/6 double-hung window and a wood louvered vent. The west elevation has three window openings covered with plywood. The first story of the north elevation has an entryway and window which have been covered with plywood, a 6-light casement window and a garage opening consisting of two wood doors on hinges. The second story of the north elevation has an entrance accessed by a collapsed, exterior wood staircase. The property is accessed by an asphalt driveway which connects the garage/carriage house with a maintenance yard of the Washington Metropolitan Area Transit Authority metrorail line to the west and the Forum Condominium parking lot to the north.

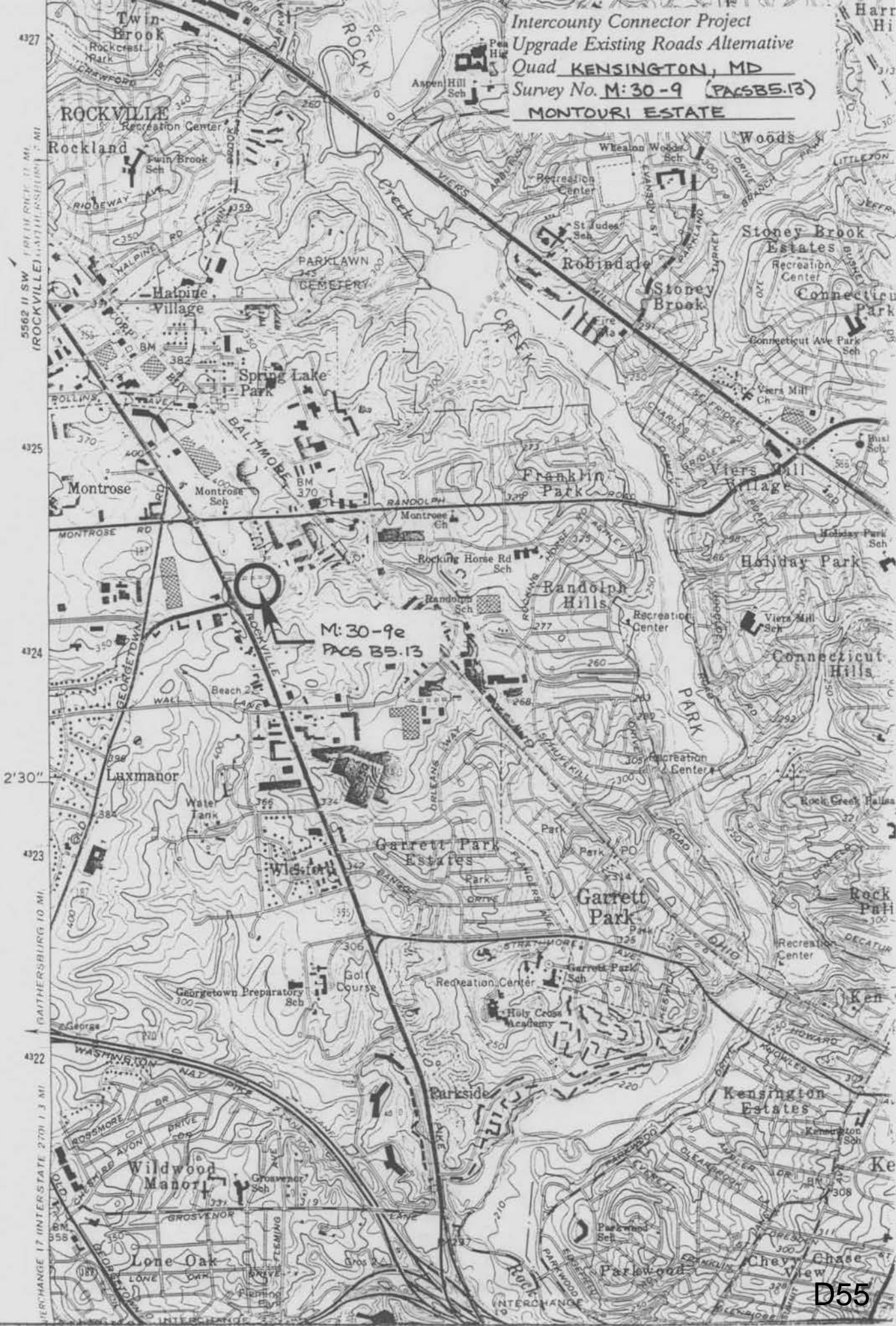
**National Register Evaluation:**

The Montouri Estate, constructed circa 1920, was previously surveyed by Maryland-National Capital Park and Planning Commission in 1975. The property is not eligible for the National Register of Historic Places. The property is not eligible under Criterion A, as research conducted indicates no association with any historic events or trends significant in the development of national, state or local history. Historic research indicates that the property has no association with persons who have made specific contributions to history, and therefore, it does not meet Criterion B. The property is not eligible under Criterion C due to a lack of architectural distinction and loss of setting. The building is a common example of an early twentieth century outbuilding. The property has lost site integrity and is no longer representative of the "estate era" along Rockville Pike due to the demolition of the main house. The property's setting has been further compromised by a high-rise condominium to the north, the White Flint Metrorail station to the south and Rockville Pike to the west. Finally, the property has no known potential to yield information important to history or prehistory, and therefore, does not meet Criterion D.

<b>MHT CONCURRENCE:</b>			
Eligibility	<input type="checkbox"/> recommended	<input checked="" type="checkbox"/> not recommended	
Criteria	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D	Considerations	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E <input type="checkbox"/> F <input type="checkbox"/> G <input type="checkbox"/> None
Comments: _____			
_____			
_____			
<i>Andrew Lewis</i>	<i>01/02/02</i>	<i>B. K. [Signature]</i>	<i>3/4/02</i>
Reviewer, Office of Preservation Services	Date	Reviewer, NR program	Date

Preparer:  
P.A.C. Spero & Company  
November 1996

Intercounty Connector Project  
Upgrade Existing Roads Alternative  
Quad **KENSINGTON, MD**  
Survey No. **M:30-9 (PACSBS.13)**  
**MONTOURI ESTATE**



4327  
5562 II SW (REFERENCE 11 MI)  
(ROCKVILLE)  
4325  
4324  
2'30"  
4323  
4322  
INTERCHANGE 17 INTERSTATE 270 1.3 MI



D56

- ① M: 30-9
- ② Montour Estate
- ③ Montgomery County, Maryland
- ④ Tim Tamburrino
- ⑤ November 1996
- ⑥ PAC Spero + Co., 40 W. Chesapeake Ave, Balt. MD
- ⑦ 11609 Rockville Pike, South elevation,  
view north
- ⑧ 1 of 6





① M: 30-9E

② Montouci Estate

③ Montgomery County, Maryland

④ Tim Tamburino

⑤ November 1996

⑥ PAC Spaw Co., 40 W. Chesapeake Ave,  
Balt., MD

⑦ 11609 Rockville Pike, south elevation,  
view north

⑧ 2 of 6



D60

- ① M: 30-9E
- ② Montouu Estate
- ③ Montgomery County, Maryland
- ④ Tim Tamburino
- ⑤ November 1996
- ⑥ PAC Spores Co., 40 W. Chesapeake Ave,  
Balt., MD
- ⑦ 11609 Rockville Pike, west elevation,  
view east
- ⑧ 3 of 6



D62

- ① M: 30-9
- ② Montoui Estate
- ③ Montgomery County, Maryland
- ④ Tim Tamburino
- ⑤ November 1996
- ⑥ PAC Spaw & Co., 40 W. Chesapeake Ave,  
Balt., MD
- ⑦ 11609 Rockville Pike, north elevation,  
view south
- ⑧ 4 of 6



D64

- ① M: 30-9
- ② Montoum Estate
- ③ Montgomery County, Maryland
- ④ Tim Tambuccino
- ⑤ November 1996
- ⑥ PTC Spaw & Co., 40 W. Chesapeake Ave.,  
Balt., MD
- ⑦ 11609 Rockville Pike, east elevation,  
view west
- ⑧ 5 of 6



D66



- ① M: 30-9
- ② Montauk Estate
- ③ Montgomery County, Maryland
- ④ Tim Tamburino
- ⑤ November 1996
- ⑥ PAC Speed & Co., 40 W. Chesapeake Ave.,  
Balt., MD
- ⑦ 11609 Rockville Pike, north elevation,  
view south
- ⑧ 6 of 6

Montouri Estate

M:30-9

This site was removed from the Locational Atlas and Index of Historic Sites in Montgomery County and is not included in the Master Plan for the county. This determination was made by the Montgomery County Planning Board on June 17, 1982.

INVENTORY FORM FOR STATE HISTORIC SITES SURVEY

**1 NAME**

HISTORIC

AND/OR COMMON

Montouri Estate

**2 LOCATION**

STREET & NUMBER

11609 Rockville Pike, opposite Old Georgetown Rd.

CITY, TOWN

Rockville

CONGRESSIONAL DISTRICT

— VICINITY OF

STATE

Maryland

COUNTY

Montgomery

**3 CLASSIFICATION**

CATEGORY

- DISTRICT
- BUILDING(S)
- STRUCTURE
- SITE
- OBJECT

OWNERSHIP

- PUBLIC
- PRIVATE
- BOTH
- PUBLIC ACQUISITION**
- IN PROCESS
- BEING CONSIDERED

STATUS

- OCCUPIED
- UNOCCUPIED
- WORK IN PROGRESS
- ACCESSIBLE**
- YES: RESTRICTED
- YES: UNRESTRICTED
- NO

PRESENT USE

- AGRICULTURE
- MUSEUM
- COMMERCIAL
- PARK
- EDUCATIONAL
- PRIVATE RESIDENCE
- ENTERTAINMENT
- RELIGIOUS
- GOVERNMENT
- SCIENTIFIC
- INDUSTRIAL
- TRANSPORTATION
- MILITARY
- OTHER:

**4 OWNER OF PROPERTY**

NAME

Felix C. Montouri

Telephone #:

STREET & NUMBER

11609 Rockville Pike

CITY, TOWN

Rockville

— VICINITY OF

STATE, zip code

Maryland

**5 LOCATION OF LEGAL DESCRIPTION**

COURTHOUSE,  
REGISTRY OF DEEDS, ETC.

Montgomery County Courthouse

Liber #:

Folio #:

STREET & NUMBER

CITY, TOWN

Rockville

STATE

Maryland

**6 REPRESENTATION IN EXISTING SURVEYS**

TITLE

DATE

— FEDERAL — STATE — COUNTY — LOCAL

DEPOSITORY FOR  
SURVEY RECORDS

CITY, TOWN

STATE

**7 DESCRIPTION**

M:30-9

<b>CONDITION</b>		<b>CHECK ONE</b>		<b>CHECK ONE</b>	
<input checked="" type="checkbox"/> EXCELLENT	<input type="checkbox"/> DETERIORATED	<input checked="" type="checkbox"/> UNALTERED	<input type="checkbox"/> ORIGINAL SITE	<input type="checkbox"/> MOVED	DATE _____
<input type="checkbox"/> GOOD	<input type="checkbox"/> RUINS	<input type="checkbox"/> ALTERED			
<input type="checkbox"/> FAIR	<input type="checkbox"/> UNEXPOSED				

**DESCRIBE THE PRESENT AND ORIGINAL (IF KNOWN) PHYSICAL APPEARANCE**

This is a large, Colonial Revival frame house that reflects the former 20th Century "estate" era along Rockville Pike. The house sits on beautifully-landscaped acreage, located directly on the now-tacky, congested Rockville Pike. The main (west) facade has five bays with a central door. The door is framed by a Georgian style architrave. There is a large, central chimney on the roof. All windows are of uniform size, and have 6/6 sashes. There are shutters on all windows. Low, one-story, enclosed sun-porches are located at the north and south-east ends of the main house.

CONTINUE ON SEPARATE SHEET IF NECESSARY

# 8 SIGNIFICANCE

M:30-9

## PERIOD

## AREAS OF SIGNIFICANCE -- CHECK AND JUSTIFY BELOW

<input type="checkbox"/> PREHISTORIC	<input type="checkbox"/> ARCHEOLOGY-PREHISTORIC	<input type="checkbox"/> COMMUNITY PLANNING	<input type="checkbox"/> LANDSCAPE ARCHITECTURE	<input type="checkbox"/> RELIGION
<input type="checkbox"/> 1400-1499	<input type="checkbox"/> ARCHEOLOGY-HISTORIC	<input type="checkbox"/> CONSERVATION	<input type="checkbox"/> LAW	<input type="checkbox"/> SCIENCE
<input type="checkbox"/> 1500-1599	<input type="checkbox"/> AGRICULTURE	<input type="checkbox"/> ECONOMICS	<input type="checkbox"/> LITERATURE	<input type="checkbox"/> SCULPTURE
<input type="checkbox"/> 1600-1699	<input type="checkbox"/> ARCHITECTURE	<input type="checkbox"/> EDUCATION	<input type="checkbox"/> MILITARY	<input type="checkbox"/> SOCIAL/HUMANITARIAN
<input type="checkbox"/> 1700-1799	<input type="checkbox"/> ART	<input type="checkbox"/> ENGINEERING	<input type="checkbox"/> MUSIC	<input type="checkbox"/> THEATER
<input checked="" type="checkbox"/> 1800-1899	<input type="checkbox"/> COMMERCE	<input type="checkbox"/> EXPLORATION/SETTLEMENT	<input type="checkbox"/> PHILOSOPHY	<input type="checkbox"/> TRANSPORTATION
<input type="checkbox"/> 1900-	<input type="checkbox"/> COMMUNICATIONS	<input type="checkbox"/> INDUSTRY	<input type="checkbox"/> POLITICS/GOVERNMENT	<input type="checkbox"/> OTHER (SPECIFY)
		<input type="checkbox"/> INVENTION		

SPECIFIC DATES

BUILDER/ARCHITECT

## STATEMENT OF SIGNIFICANCE

This is one of the few "estate era" houses still being maintained along Rockville Pike. The present owner, Dr. Montouri, has lived here for years and may have built the house.

CONTINUE ON SEPARATE SHEET IF NECESSARY

**9 MAJOR BIBLIOGRAPHICAL REFERENCES**

M:30-9

CONTINUE ON SEPARATE SHEET IF NECESSARY

**10 GEOGRAPHICAL DATA**

ACREAGE OF NOMINATED PROPERTY \_\_\_\_\_

VERBAL BOUNDARY DESCRIPTION

LIST ALL STATES AND COUNTIES FOR PROPERTIES OVERLAPPING STATE OR COUNTY BOUNDARIES

STATE COUNTY

STATE COUNTY

**11 FORM PREPARED BY**

NAME / TITLE

Michael F. Dwyer, Senior Park Historian

ORGANIZATION

M-NCPPC

DATE

5/14/75

STREET & NUMBER

8787 Georgia Ave.

TELEPHONE

589-1480

CITY OR TOWN

Silver Spring

STATE

Maryland

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RETURN TO: Maryland Historical Trust  
The Shaw House, 21 State Circle  
Annapolis, Maryland 21401  
(301) 267-1438

M:30-9

FOR ADDITIONAL INFORMATION

See correspondence dated June 12, 1984

ACTION TAKEN

The following sites have been reviewed and found not suitable for regulation under the Historic Preservation Ordinance. Those sites also listed on the Locational Atlas will no longer be subject to regulation under the Moratorium on Alteration and Demolition.

Site No.

10/2		23/70
10/9		23/98-1
10/11		24/12
10/22		24/14
10/25		24/15
10/54		25/1
10/71		25/10-1
10/73	15/68	27/5
	15/69	27/7
10/74	16/19	*27/11
11/8	*17/4	*27/13
12/14-1	17/55	28/15
12/16	18/1	28/26
12/26	18/9	30/3
	18/22	30/7
13/15	18/27	30/9
13/16	18/29-1	30/15
13/28	19/8	30/17
13/32	19/18	30/19
	19/20	31/9
14/1	20/6	33/3
14/15	20/14	33/5
14/18	20/27	33/11
14/19	22/5	*34/1
14/23	22/6-1	*34/9
14/30	22/18	
14/31	22/21	
14/40	22/22	
14/48	22/23	
14/54	22/24	
15/10	23/13	
15/11		
15/18		
*15/62		

Site No.

35/6  
36/9  
\*37/4

\*Recommended for designation by the Mont. Co. Historic Preservation Commission.

\*\*These sites were previously considered by the County Council and found not to warrant regulation under the Historic Preservation Ordinance. They are listed here to bring the functional Master Plan in conformance with Council's actions.



D74



NAME MANTOURI ESTATE

(20TH.C. ESTATES) #30-9

LOCATION

ROCKVILLE PIKE OPP. OLD GEOTOWN, Rd

FACADE

SW

ROCKVILLE, Md

PHOTO TAKEN

5/14/75 MDWYER