

<u>NOTES</u>

- 1. FOR DROP CEILING AND ARCHITECTURAL TREATMENT DETAILS, SEE ARCHITECTURAL DRAWINGS.
- 2. FOR LIMITS OF SECTION E, SEE DRAWING S-04.
- 3. ALL LONGITUDINAL BARS ARE #4 @ 12" EXCEPT AS NOTED.

Date

4. ARCHITECTURAL TREATMENT FROM SECTION 112+20.14 TO 112+32.14 SHALL BE CUSTOM ROCK T323, LIMESTONE 1".

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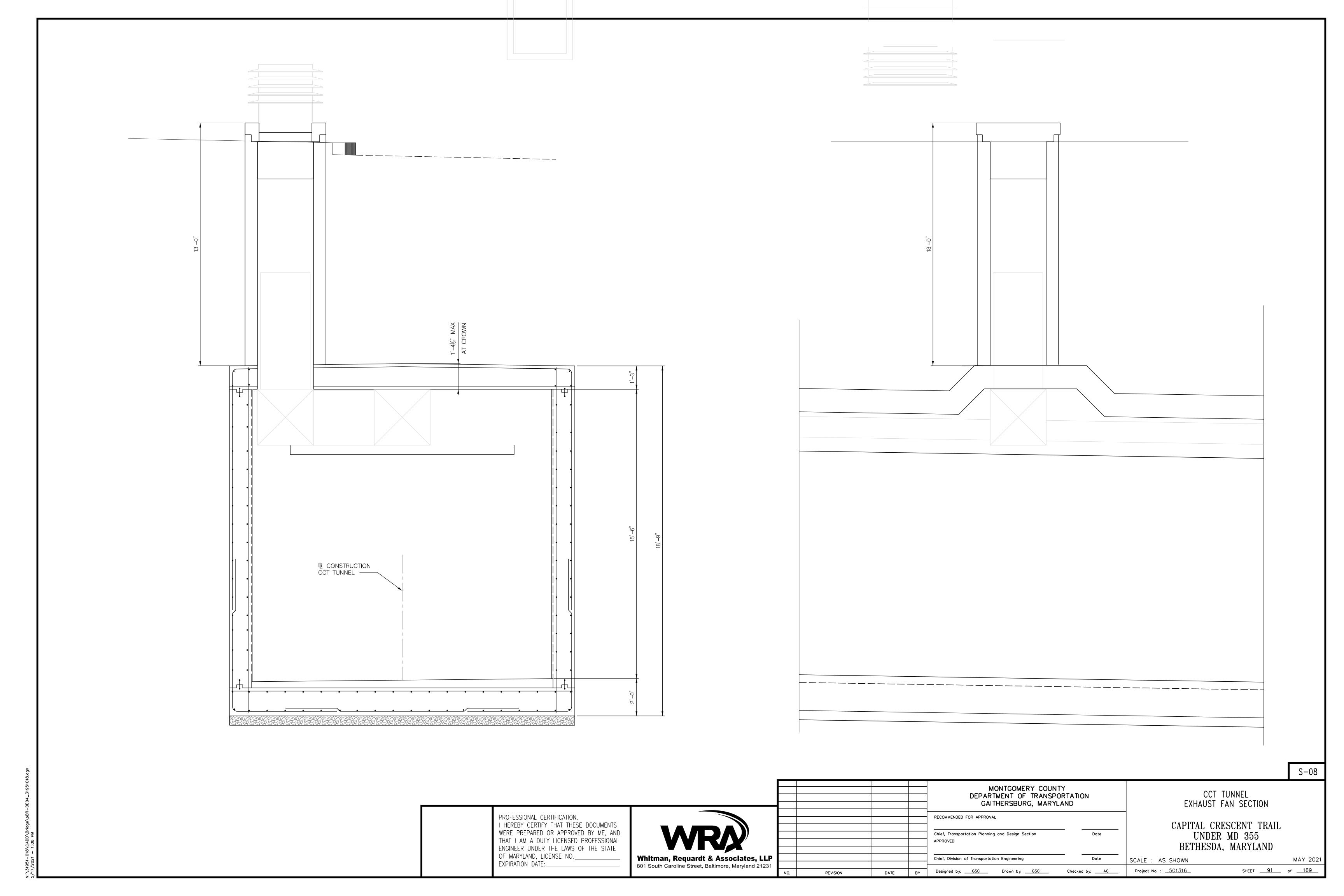
			MONTGOMERY COUNTY DEPARTMENT OF TRANSPORT GAITHERSBURG, MARYLANI	
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			Chief, Transportation Planning and Design Section APPROVED	
			Chief, Division of Transportation Engineering	
REVISION	DATE	BY	Designed by: <u>GSC</u> Drawn by: <u>GSC</u> CI	necked by:

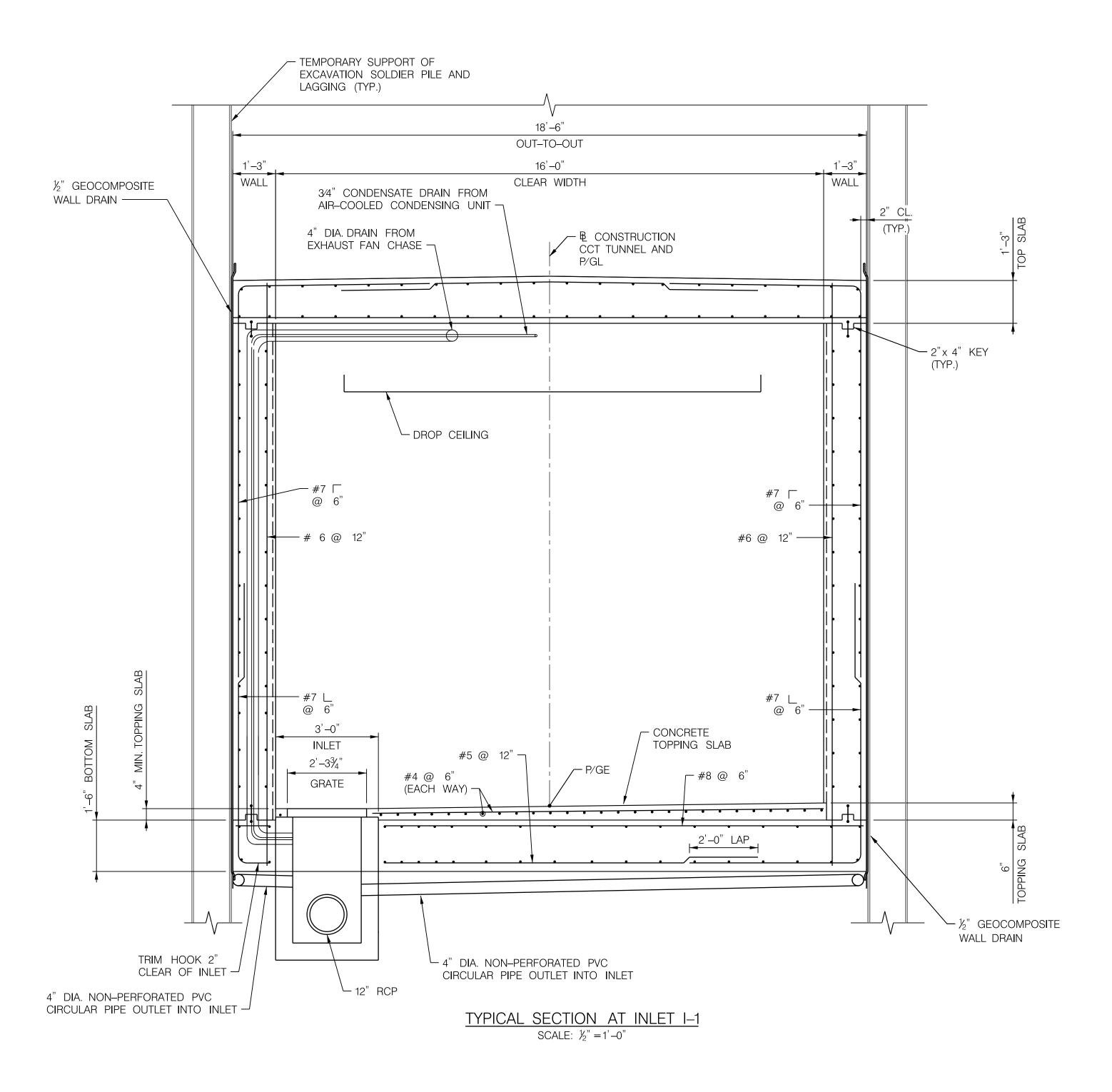
CCT TUNNEL TYPICAL SECTIONS

CAPITAL CRESCENT TRAIL UNDER MD 355 BETHESDA, MARYLAND

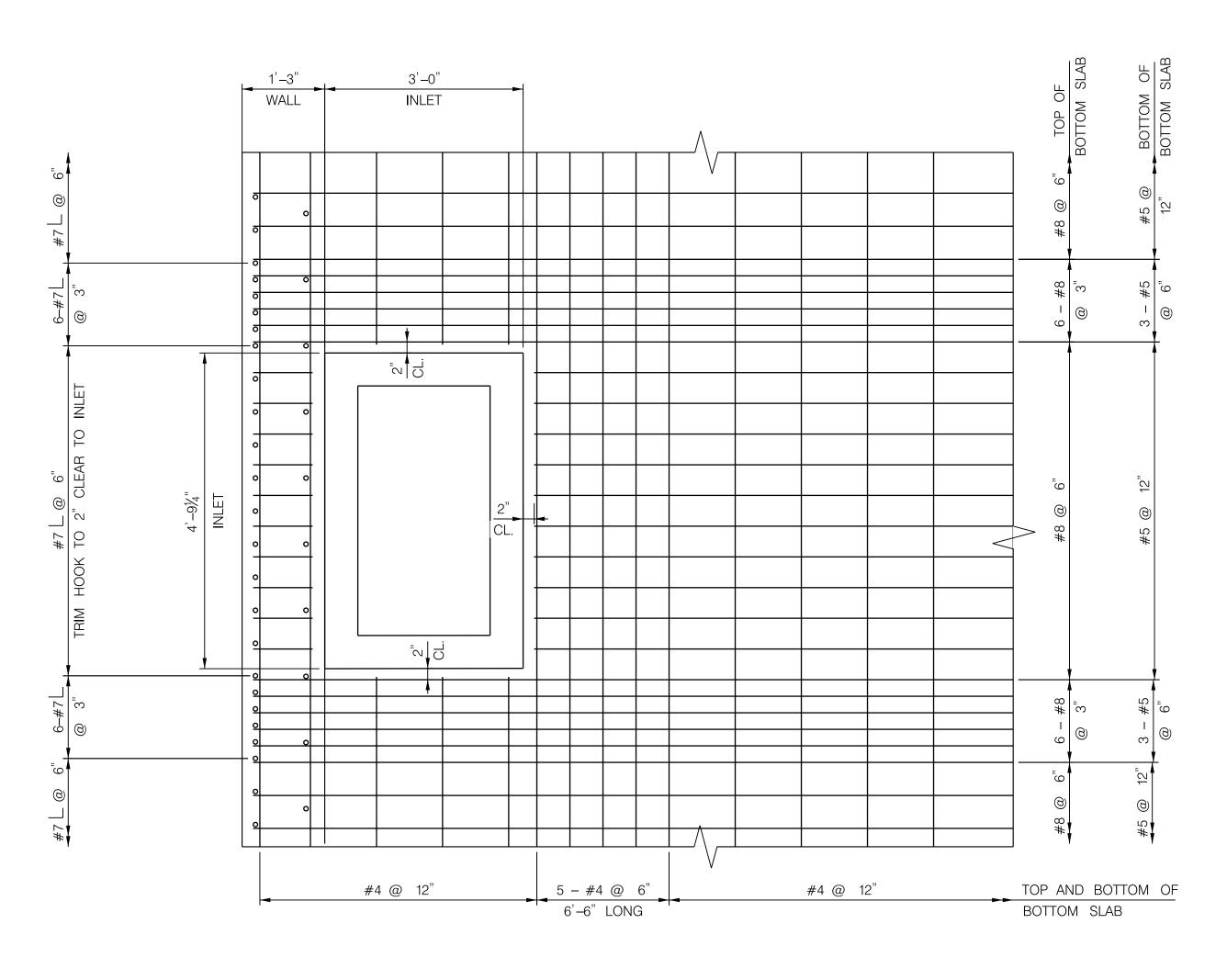
 SCALE: AS SHOWN
 MAY 2021

 Project No.: 501316
 SHEET 90 of 169





NOTE: 6" NO. 57 STONE SUBBASE NOT SHOWN FOR CLARITY.



BOTTOM SLAB REINFORCING PLAN AT INLET I-1 SCALE: $\frac{3}{4}$ " = 1'-0"

- 1. DETAILS SHOWN ARE FOR INLET I-1. DETAILS AT INLET I-2 TO BE SIMILAR EXCEPT THAT TRANSVERSE BARS IN TOP OF BOTTOM SLAB SHALL BE #7 INSTEAD OF #8. FOR LOCATIONS OF I-1 AND I-2, SEE DRAWING S-03
- 2. FOR ADDITIONAL TUNNEL AND CONCRETE TOPPING SLAB REINFORCING DETAILS, SEE DRAWING S-05.
- 3. FOR ADDITIONAL DETAILS OF THE 3/4" AND 4" DIAMETER DRAINS, SEE PLUMBING DRAWINGS.
- 4. ADJUST REINFORCEMENT PATTERN TO PLACE NEAREST BARS 2" CLEAR OF THE INLET.

5. ALL LONGITUDINAL BARS ARE #4 @ 12" UNLESS OTHERWISE NOTED.

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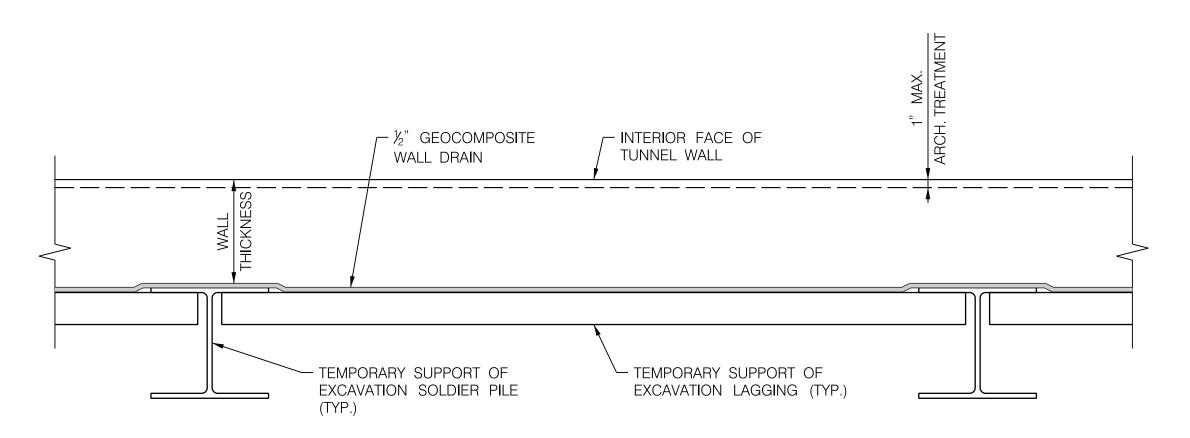


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				Chief, Transportation Planning and Design Section APPROVED	Date	
				Chief, Division of Transportation Engineering	Date	S
NO.	REVISION	DATE	BY	Designed by: <u>GSC</u> Drawn by: <u>GBL</u> CI	necked by: <u>AC</u>	

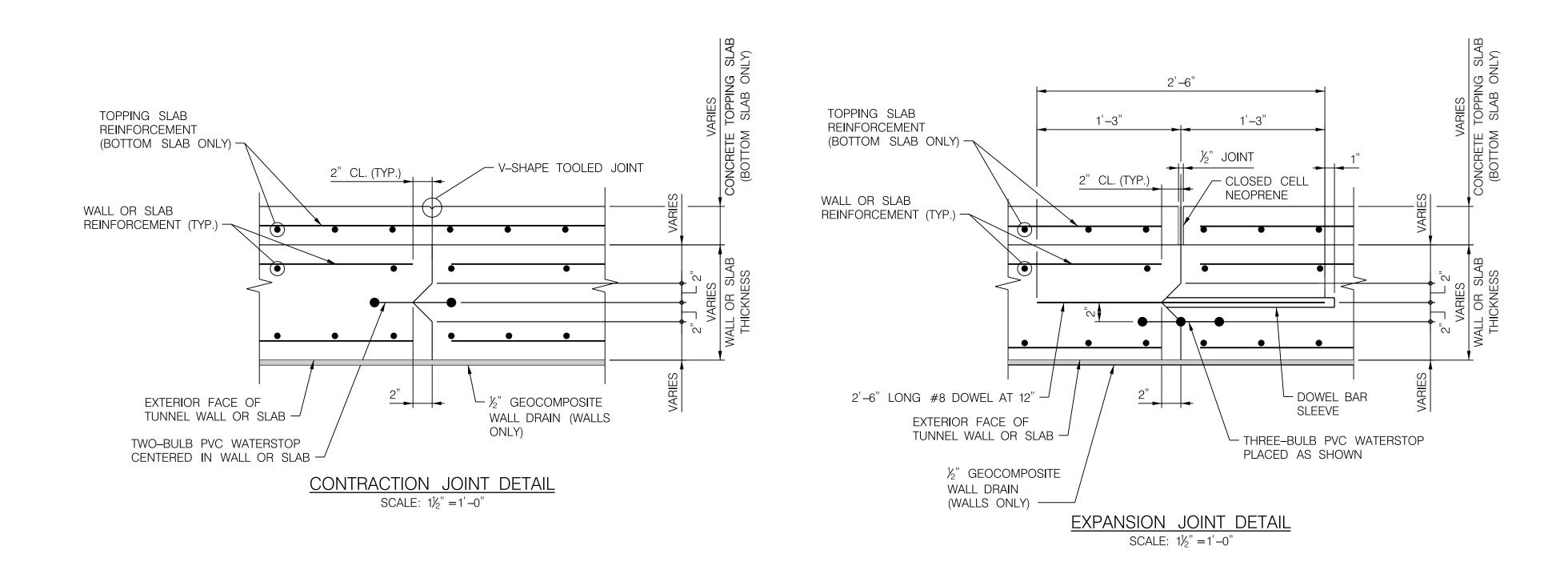
CCT TUNNEL DETAIL AT INLET

CAPITAL CRESCENT TRAIL UNDER MD 355 BETHESDA, MARYLAND

MAY 2021 SCALE : AS SHOWN SHEET <u>92</u> of <u>169</u> Project No. : <u>501316</u>



GEOCOMPOSITE WALL DRAIN DETAIL SCALE: 1" = 1'-0"



NOTES:

1. JOINT SHALL BE CLOSED CELL NEOPRENE SPONGE ELASTOMER IN CONFORMANCE WITH SECTION 911.10.

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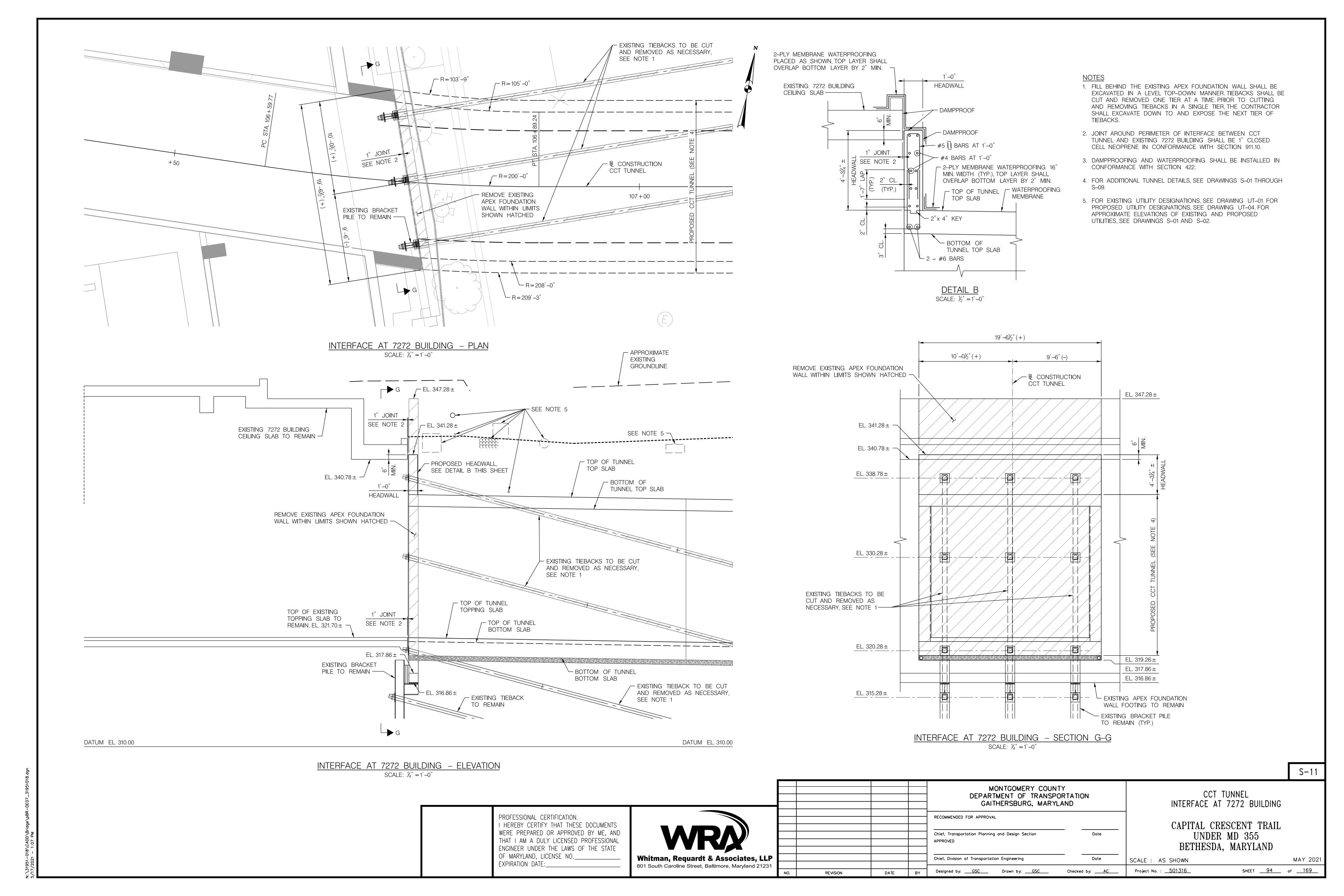
			MONTGOMERY COUNTY DEPARTMENT OF TRANSPOR GAITHERSBURG, MARYLA	RTATION	
			RECOMMENDED FOR APPROVAL		CAPITA
			Chief, Transportation Planning and Design Section APPROVED	Date	U BET
			Chief, Division of Transportation Engineering	Date	SCALE : AS SHOWN
REVISION	DATE	BY	Designed by: <u>GSC</u> Drawn by: <u>GSC</u>	Checked by: AC	Project No. : <u>501316</u>

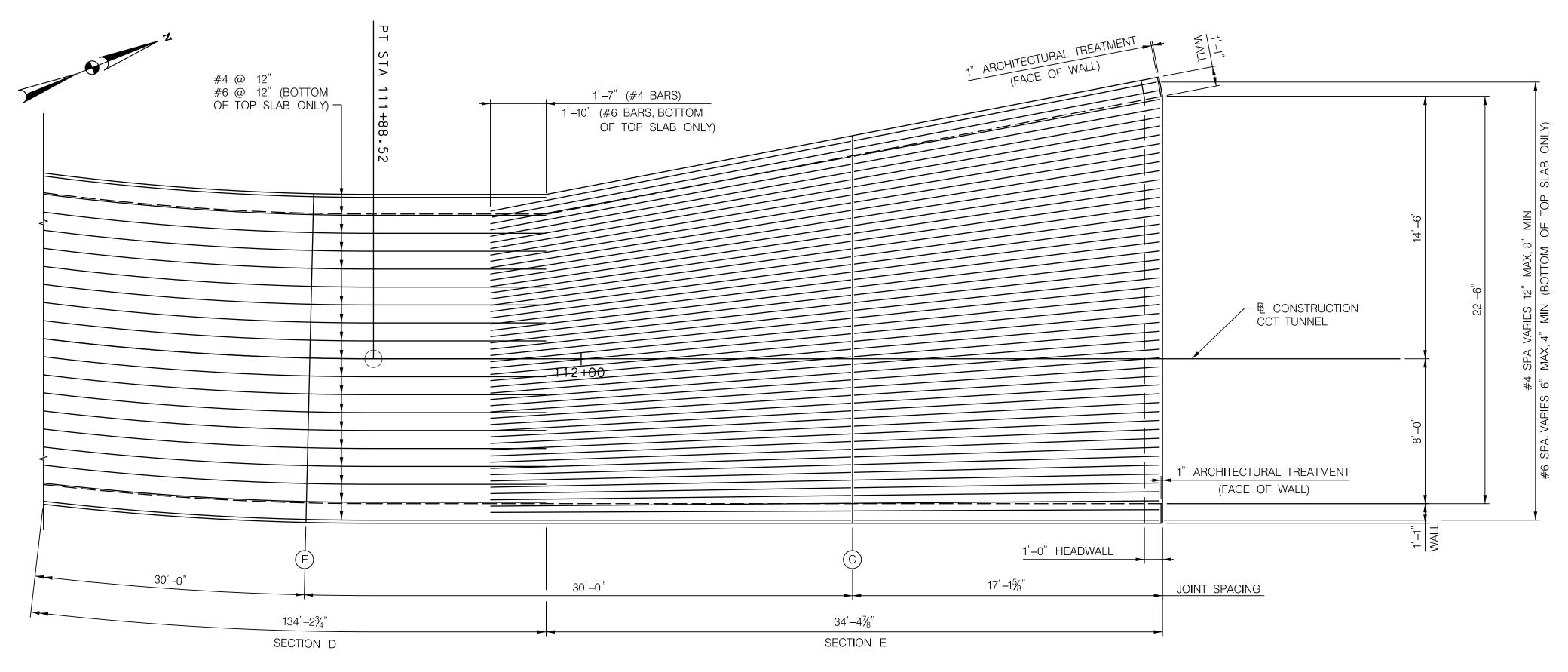
CCT TUNNEL DETAILS S-10

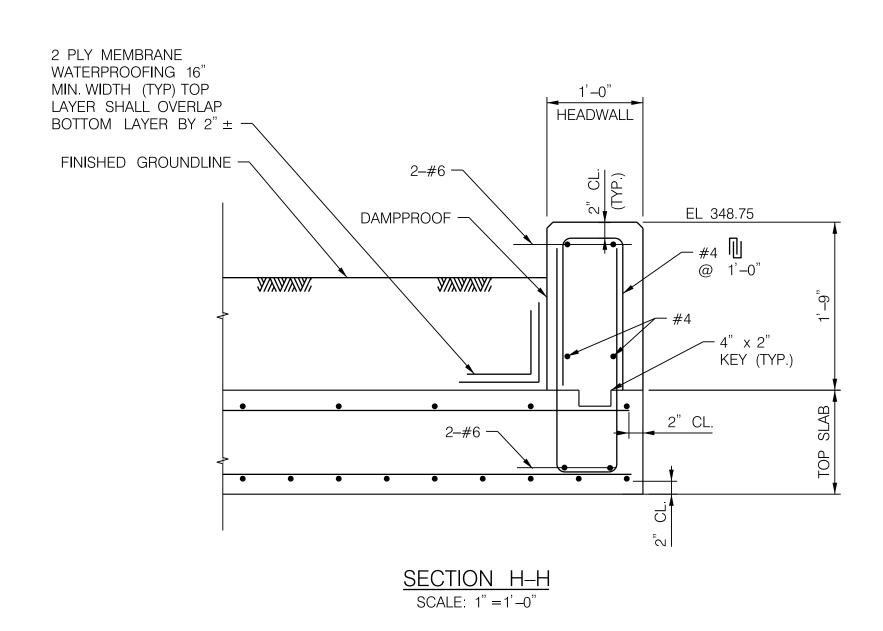
CAPITAL CRESCENT TRAIL UNDER MD 355 BETHESDA, MARYLAND

CALE : AS SHOWN MAY 2021

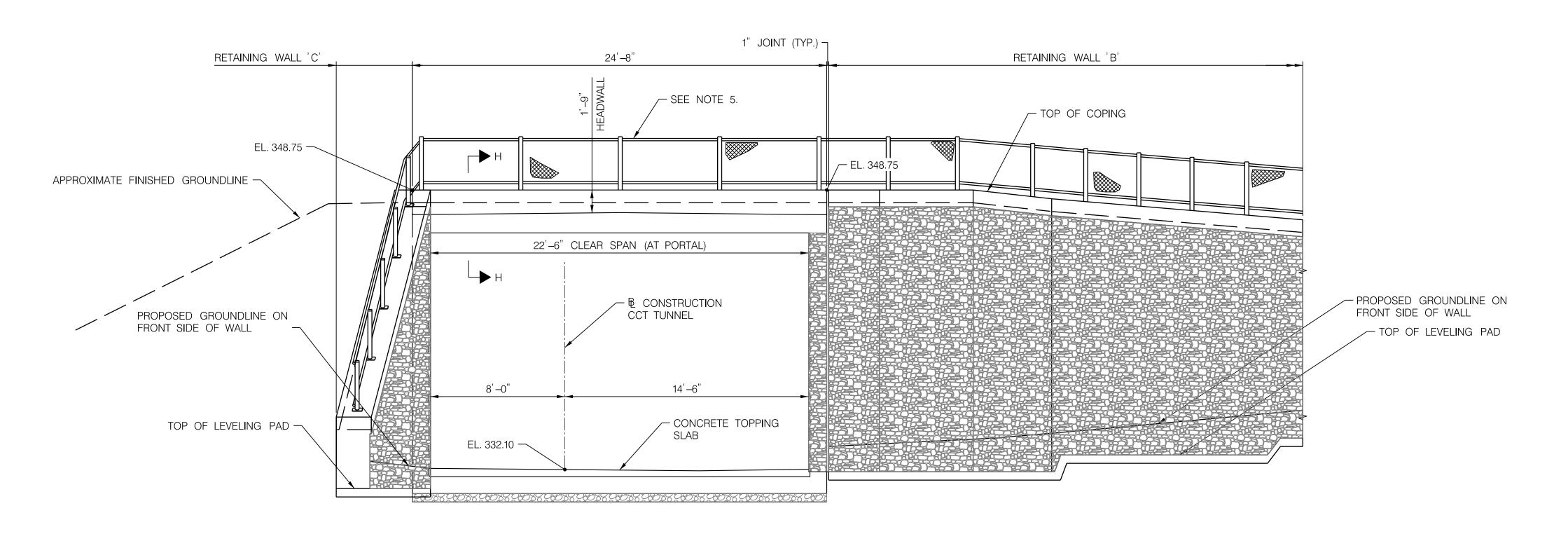
Project No. : _501316 SHEET _93 of _169_







TOP & BOTTOM SLAB LONGITUDINAL REINFORCEMENT PLAN — EAST PORTAL SCALE: 1/4" = 1'-0"



ELEVATION - EAST PORTAL SCALE: $\frac{1}{4}$ " = 1'-0"

1. TRANSVERSE REINFORCEMENT NOT SHOWN IN PLAN FOR CLARITY. FOR REINFORCEMENT DETAILS, SEE DRAWING S-06 AND S-07 FOR TYPICAL SECTION D AND TYPICAL SECTION E RESPECTIVELY.

2. (C) INDICATES CONTRACTION JOINT (SEE DRAWING S-10)

(E) INDICATES EXPANSION JOINT (SEE DRAWING S-10)

3. FOR RETAINING WALLS B AND C DETAILS, SEE DRAWING RW-02 and RW-03 RESPECTIVELY.

4. ARCHITECTURAL TREATMENT SHALL BE CUSTOM ROCK PATTERN T323, LIMESTONE 1".

5. FOR FENCE DETAILS, SEE DRAWING S-18.

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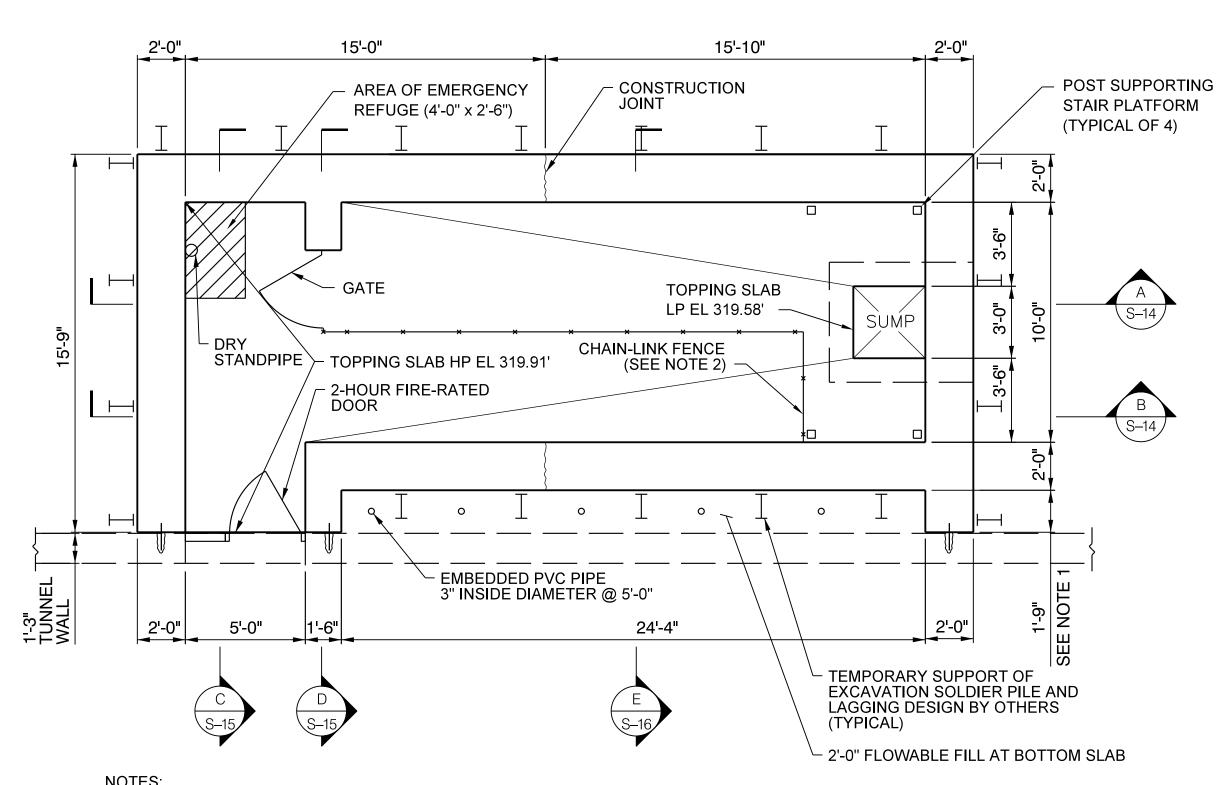
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			Chief, Division of Transportation Engineering	Dote	S
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CCT TUNNEL EAST PORTAL DETAILS

CAPITAL CRESCENT TRAIL UNDER MD 355

BETHESDA, MARYLAND MAY 2021 SCALE : AS SHOWN Project No. : <u>501316</u> SHEET <u>95</u> of <u>169</u>

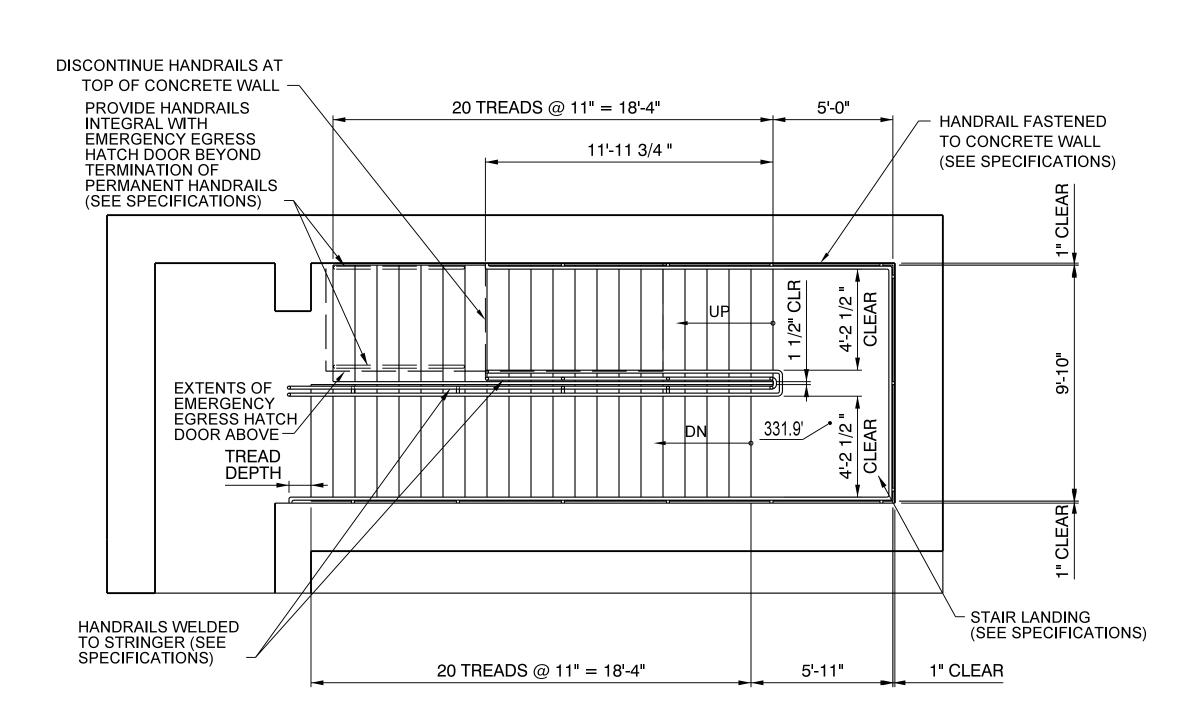


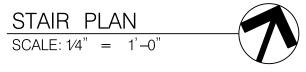
1. REDUCE DIMENSION AS REQUIRED FOR BASE SLAB TO MEET FACE OF TEMPORARY SUPPORT OF EXCAVATION.

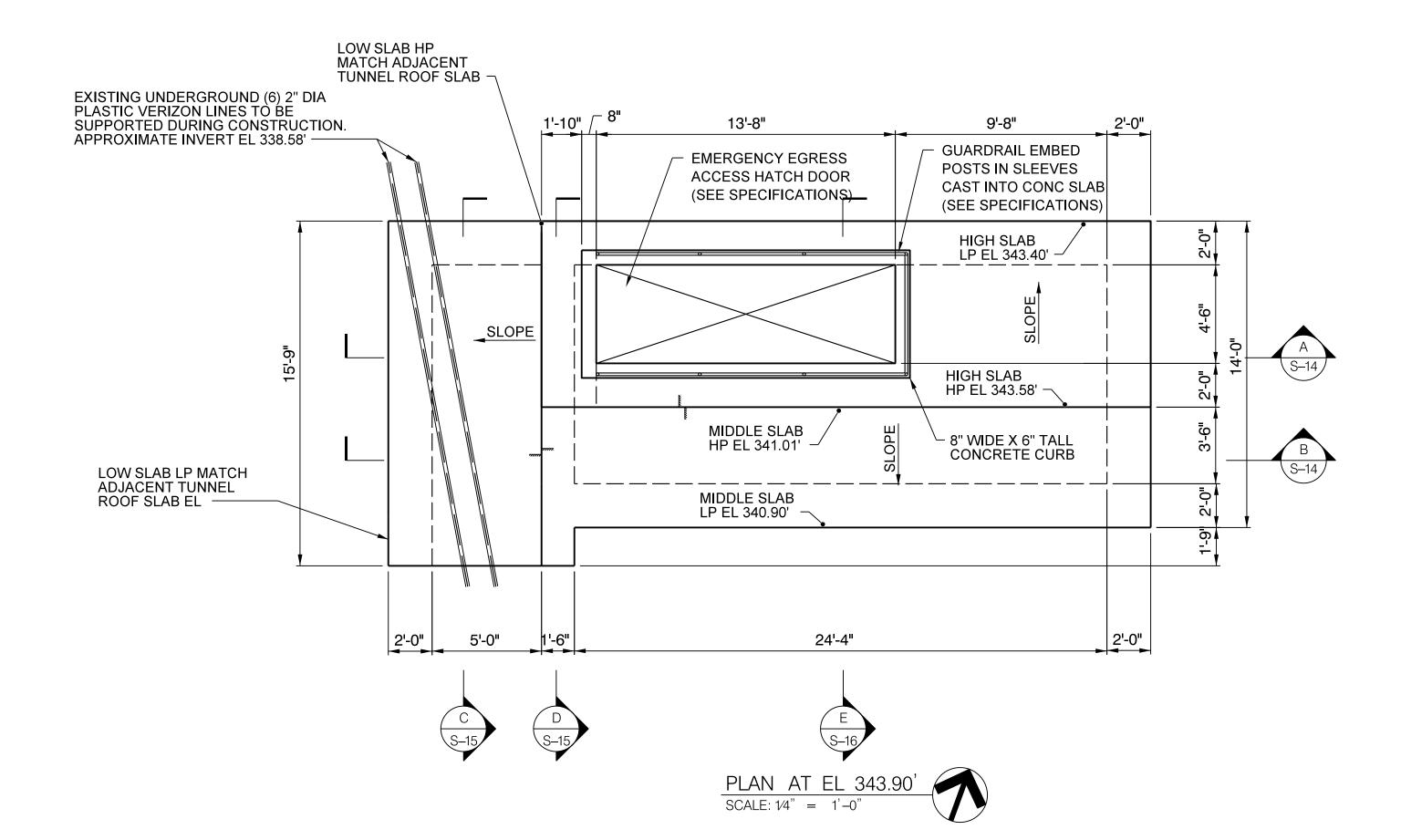
2. ALIGN CHAIN-LINK FENCE LOCATION TO MEET UNDERSIDE OF LANDING AND UPPER STAIR STRINGER.

PLAN AT EL 319.91'

SCALE: 1/4'' = 1'-0''







GENERAL SHEET NOTES

REFER TO DRAWING S-01 FOR GENERAL STRUCTURAL NOTES AND TYPICAL DETAILS.

0 2' 4' 8'

SCALE: 1/4" = 1'-0"

S-13

SHEET <u>96</u> of <u>169</u>

SCALE: 1/4" = 1'-0"

MONTGOMERY COUNTY
DEPARTMENT OF TRANSPORTATION

CCT TUNNEL

Checked by: _____

DEPARTMENT OF TRANSPORTATION GAITHERSBURG, MARYLAND

RECOMMENDED FOR APPROVAL

Chief, Transportation Planning and Design Section

Designed by: <u>SA</u> Drawn by: <u>AB</u>

Chief, Division of Transportation Engineering

EMERGENCY EGRESS STAIR PLANS

CAPITAL CRESCENT TRAIL

UNDER MD 355

UNDER MD 355
BETHESDA, MARYLAND

SCALE: 1/4" = 1'-0" MAY 2021

Project No. : <u>501316</u>

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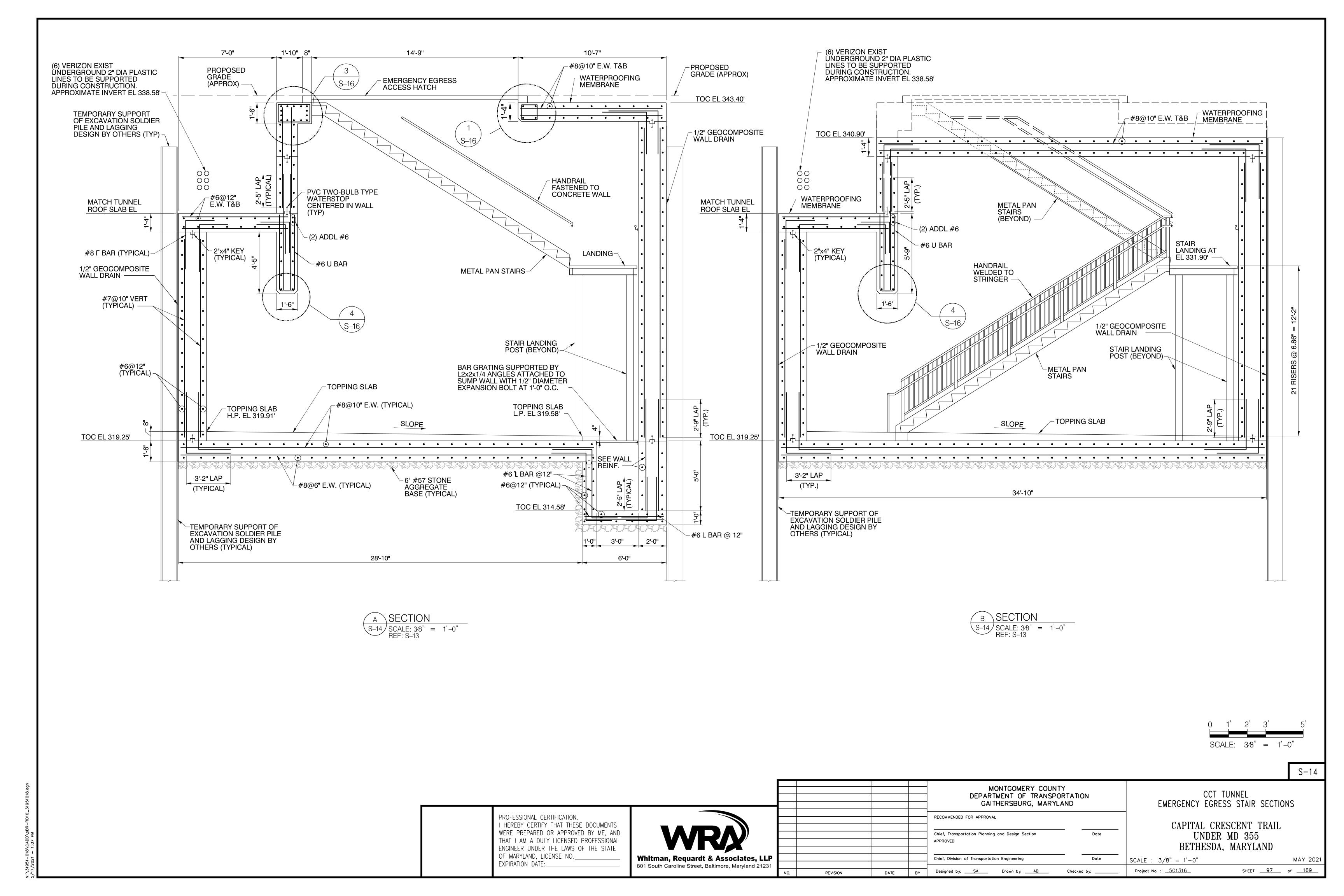
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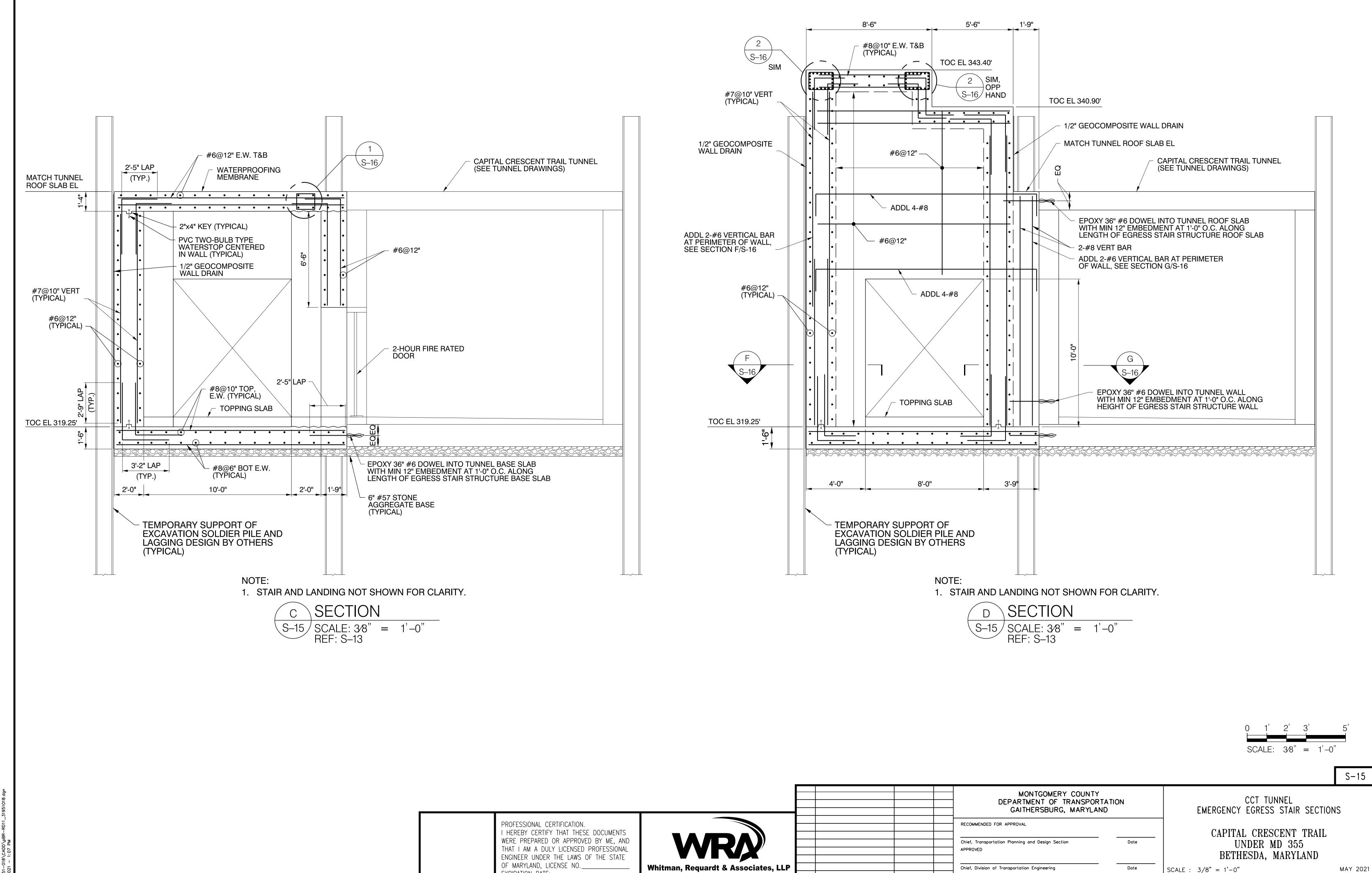
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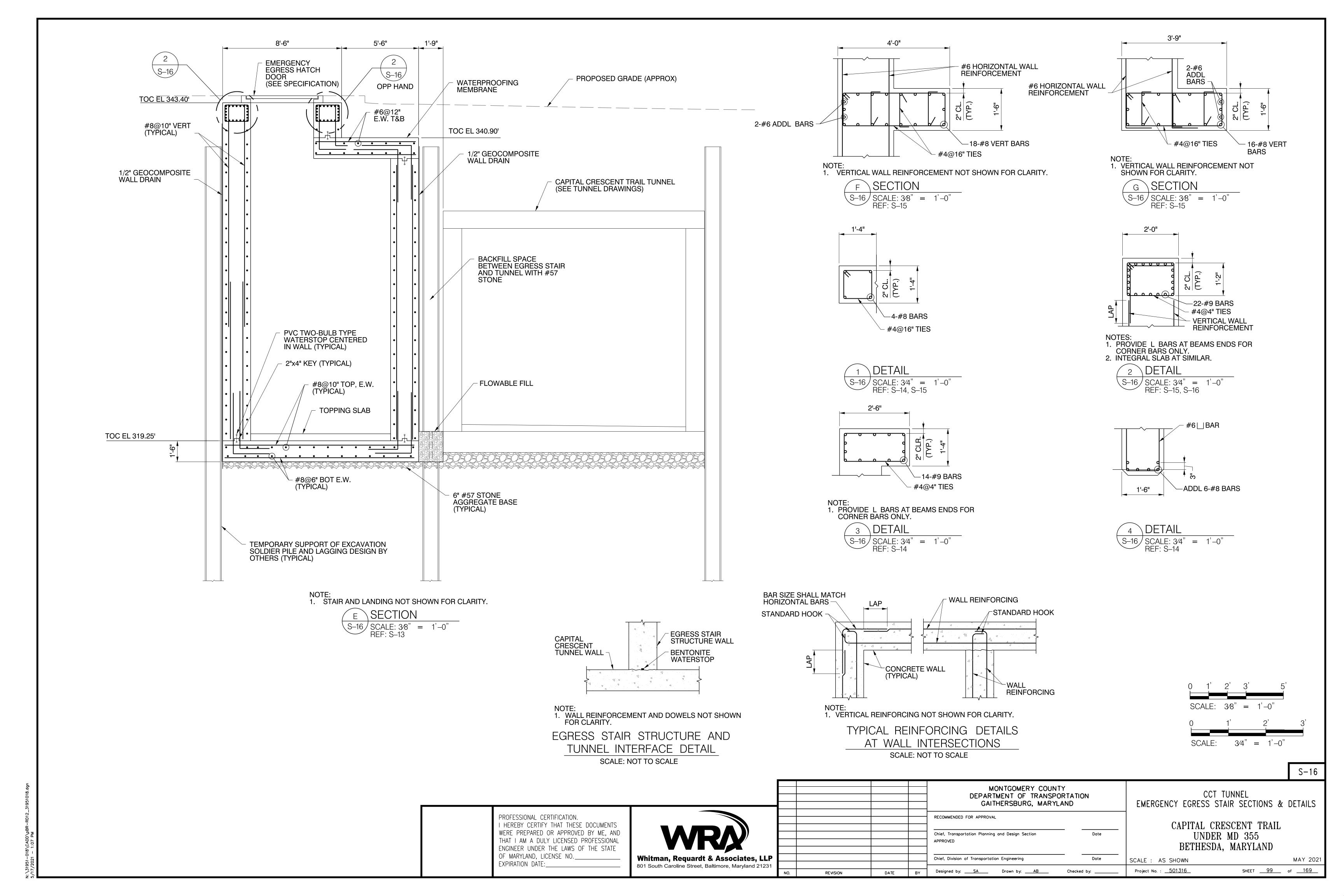
Project No. : <u>501316</u>

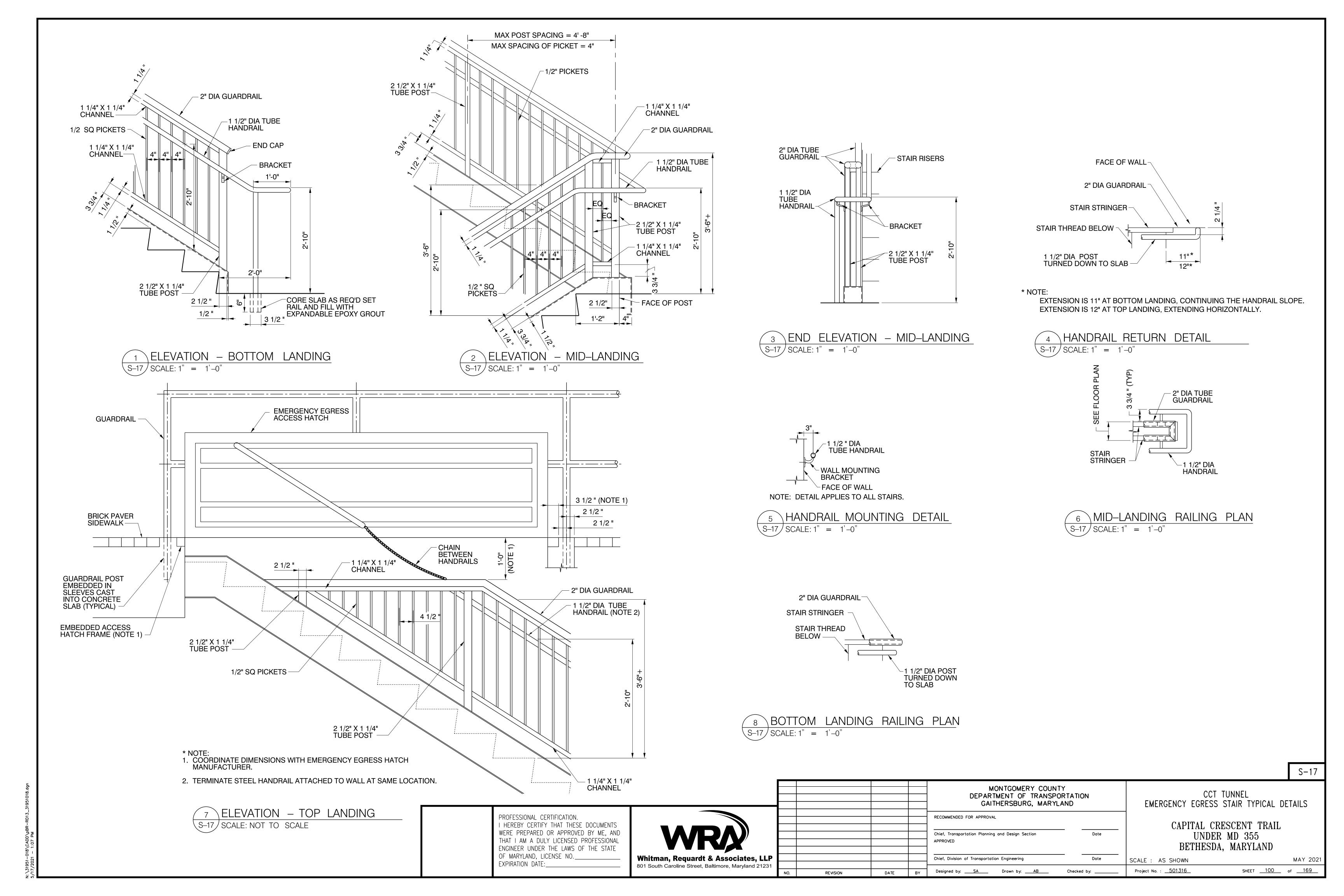
Checked by: _____

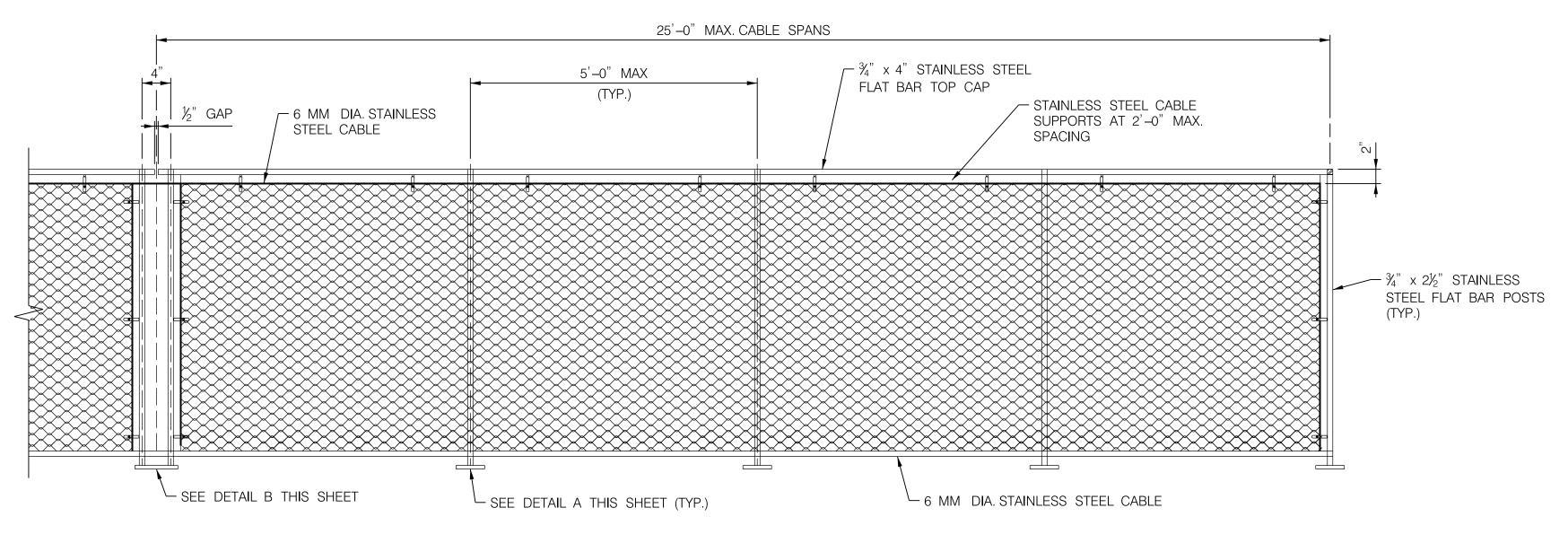
Designed by: SA Drawn by: AB

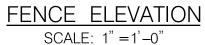
SHEET <u>98</u> of <u>169</u>

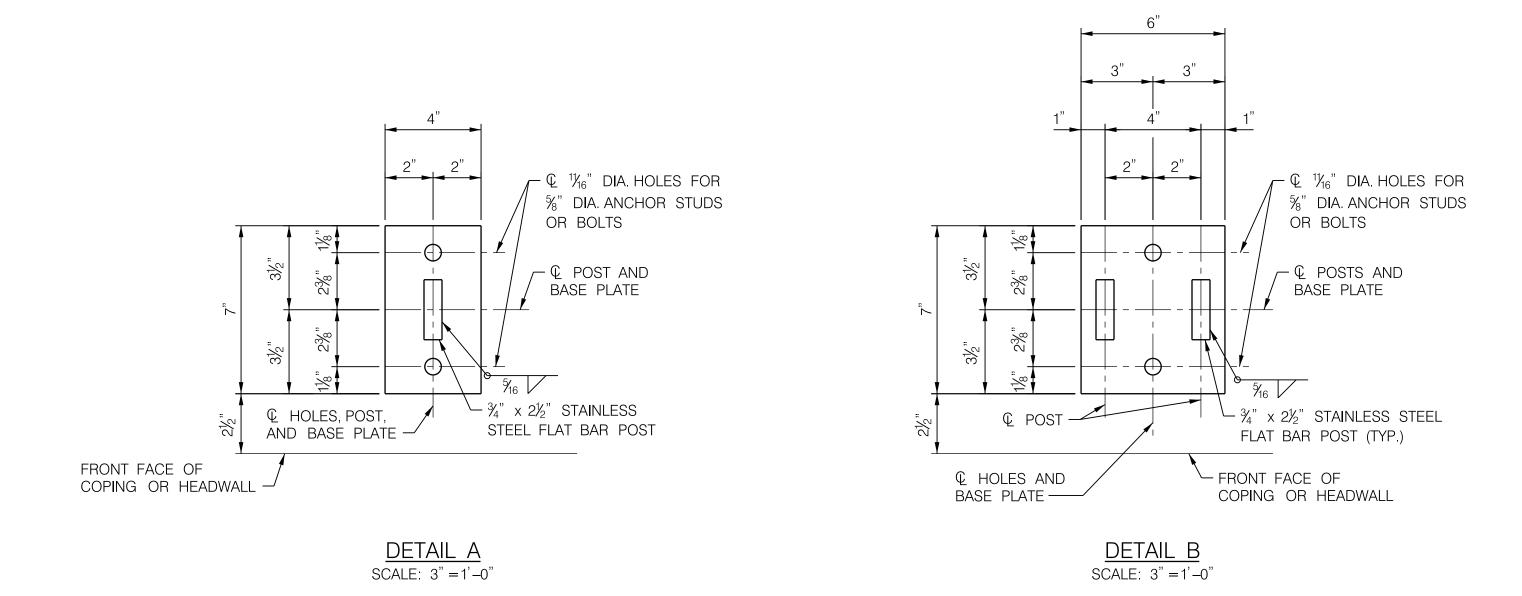
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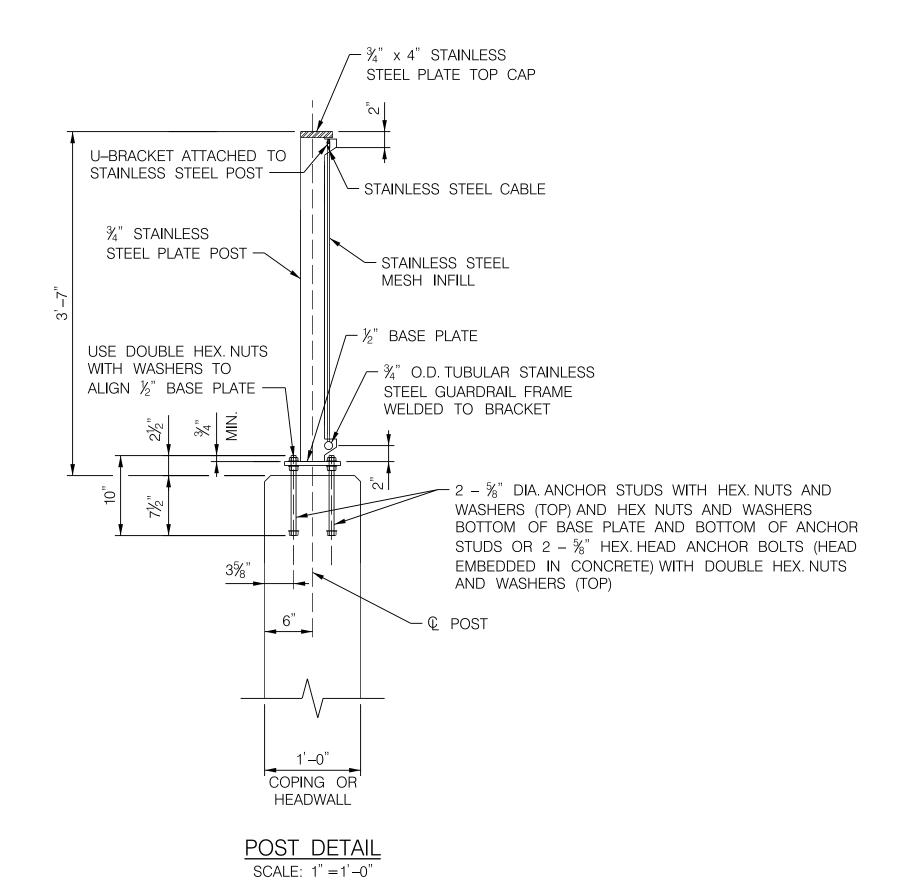












<u>NOTES</u>

- 1. FENCE TO BE USED ON TOP OF RETAINING WALLS B AND C AND ON TOP OF TUNNEL EAST PORTAL HEADWALL.
- 2. ALL STAINLESS STEEL TO RECEIVE A #4 LINEAR SATIN FINISH.
- 3. STAINLESS STEEL MESH INFILL, MESH HARDWARE, FLAT BARS, AND BASE PLATES SHALL BE GRADE 316.
- 4. ANCHOR STUDS OR ANCHOR BOLTS SHALL CONFORM TO ASTM A 276, TYPE 430 OR TYPE 304 STAINLESS STEEL ANNEALED, HOT-FINISHED, ULTIMATE STRENGTH 70,000 PSI MIN., 20% MIN. ELONGATION. THREADS MAY BE ROLLED OR CUT.
- 5. ALL EXPOSED WELDS TO BE GROUND SMOOTH AND FINISHED TO MATCH MATERIAL.
- 6. WIRE MESH INFILL TO BE WOVEN TO TOP AND BOTTOM CABLES AND ½" STAINLESS STEEL RODS AT TERMINATION POSTS PER MANUFACTURER'S INSTRUCTIONS.
- 7. ALL LONGITUDINAL RAILS OR CABLES SHALL BE PARALLEL TO TOP OF WALL ALL POSTS SHALL BE SET NORMAL TO TOP OF WALL.
- 8. IF CONTRACTOR ELECTS TO PLACE ANCHOR STUDS AFTER PLACING CONCRETE COPING OR HEADWALL, NEWLY PLACED REBARS SHALL BE LOCATED SO THAT CORING DOES NOT DAMAGE SAME. ALL HOLES SHALL BE CORED (NOT DRILLED) AND THE DIAMETER OF THE CORED HOLES FOR THE ANCHOR STUDS SHALL BE $\frac{7}{8}$ " DIAMETER.
- 9. THE FURNISHING, FABRICATING, ERECTING, ETC., OF ALL NEW FENCE ON THE RETAINING WALLS OR HEADWALLS, COMPLETE IN PLACE, WILL NOT BE MEASURED FOR PAYMENT BUT ALL COSTS THEREOF SHALL BE INCLUDED IN THE CONTRACT LUMP SUM PRICES FOR THE PERTINENT RETAINING WALL OR TUNNEL ITEMS.

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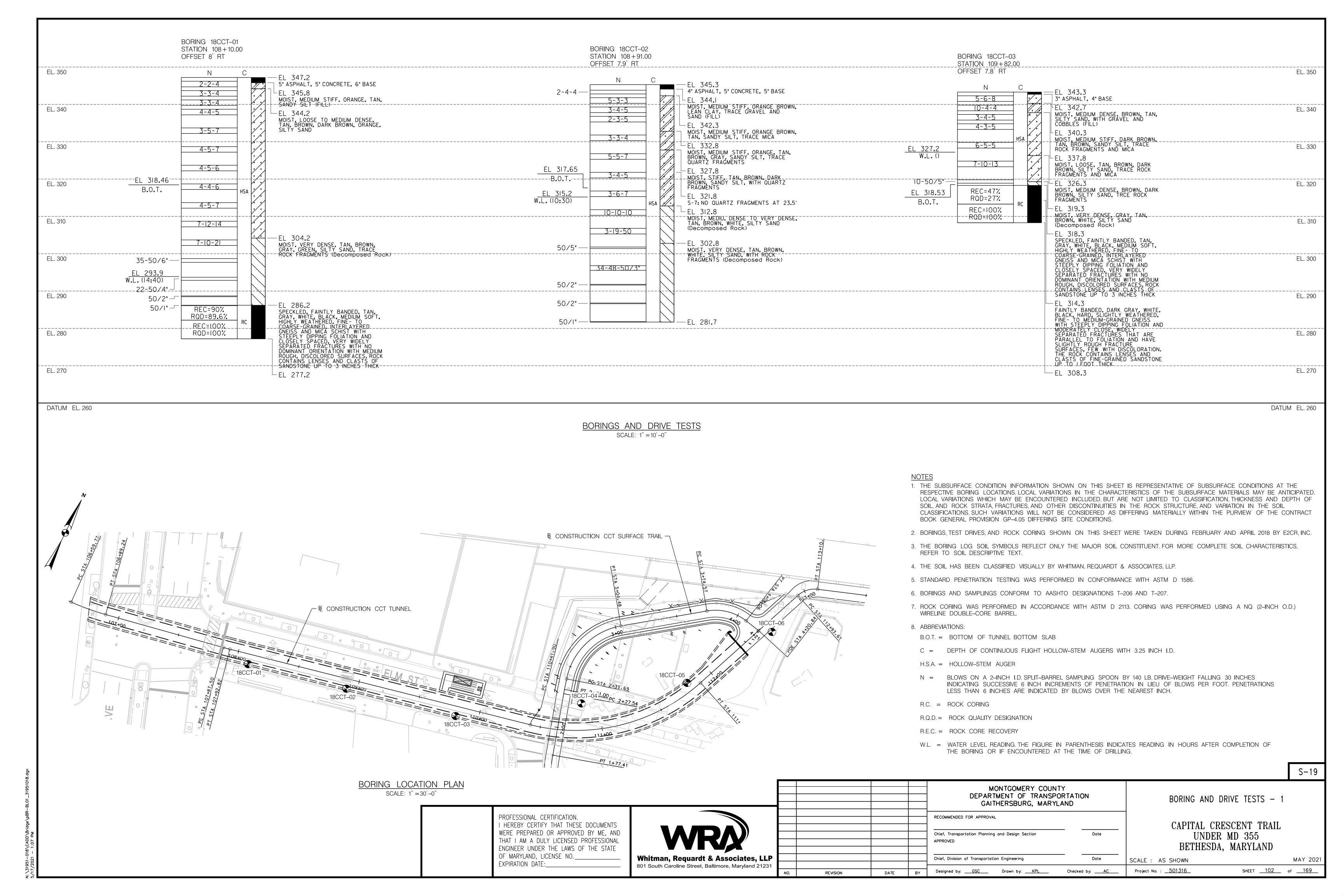
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			Chief, Division of Transportation Engineering	Date	SC
REVISION	DATE	BY	Designed by: <u>GSC</u> Drawn by: <u>GBL</u>	Checked by: AC	F

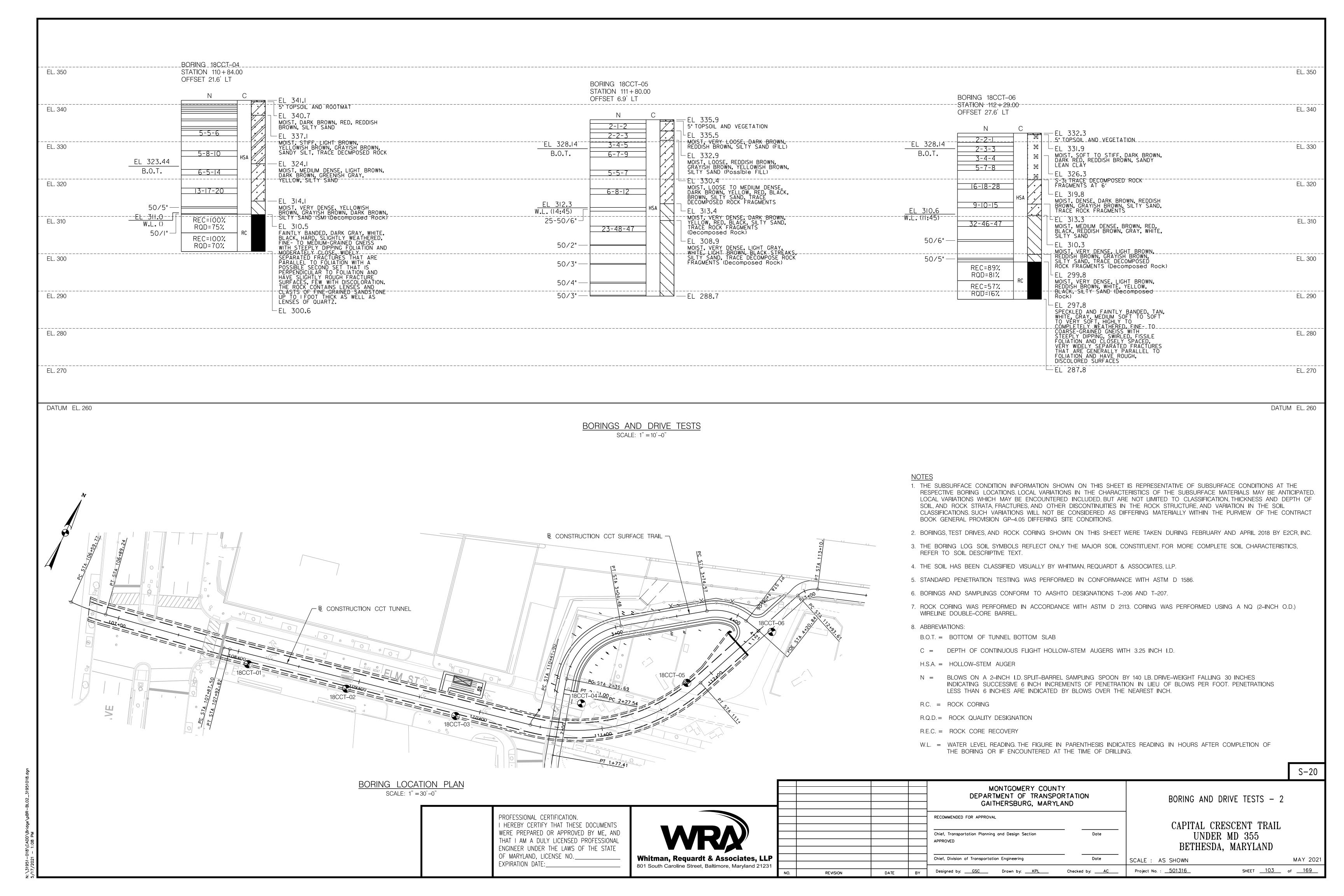
CCT TUNNEL FENCE DETAILS

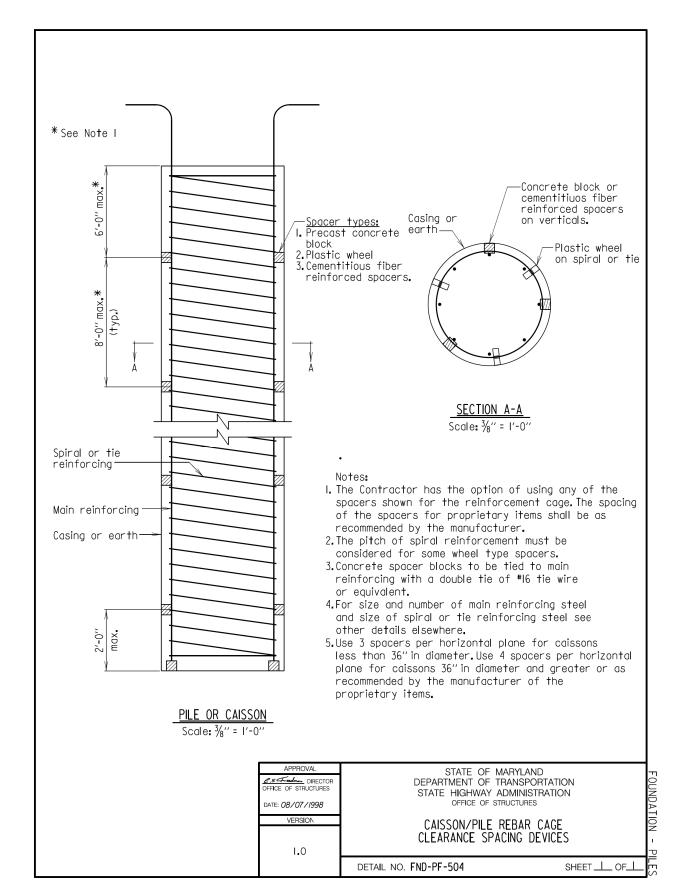
CAPITAL CRESCENT TRAIL UNDER MD 355 BETHESDA, MARYLAND S-18

 SCALE: AS SHOWN
 MAY 2021

 Project No.: 501316
 SHEET 101 of 169







OF MARYLAND, LICENSE NO.____ EXPIRATION DATE:_



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Chief, Transportation Planning and Design Section APPROVED	Date	

STRUCTURAL DETAILS - 1

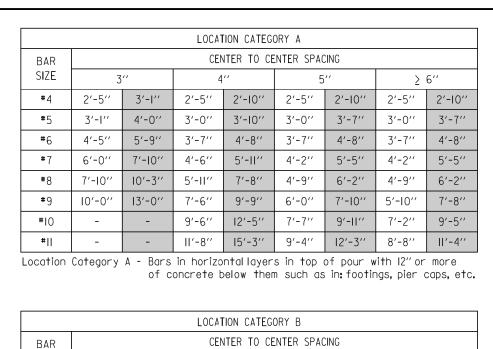
S-21

CAPITAL CRESCENT TRAIL UNDER MD 355 BETHESDA, MARYLAND

ALE : AS SHOWN MAY 2021 SHEET <u>104</u> of <u>169</u>

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L	LOCATION CATEGORY B												
	BAR		CENTER TO CENTER SPACING										
	SIZE	3	"	4′′		5	"	<u>></u>	ô''				
	#4	1'-10''	2'-9''	1'-10''	2'-2''	1'-10''	2'-2''	1′-10′′	2'-2''				
	# 5	2′-5′′	3′-7′′	2'-4''	3′-5′′	2'-4''	2′-9′′	2'-4''	2'-9''				
	# 6	3′-5′′	5′-1′′	2'-9''	4'-1''	2′-9′′	4'-1''	2′-9′′	4'-1''				
	#7	4'-8''	6′-11′′	3′-6′′	5′-3′′	3′-2′′	4′-9′′	3'-2''	4'-9''				
	# 8	6′-1′′	9′-1′′	4′-7′′	6′-10′′	3′-8′′	5′-5′′	3'-8''	5′-5′′				
	#9	7′-8′′	11'-6''	5′-9′′	8'-8''	4'-8''	6′-11′′	4′-6′′	6′-9′′				
	#10	-	-	7′-4′′	10'-11''	5′-10′′	8′-9′′	5′-7′′	8'-4''				
	#	-	-	9'-0''	13′-6′′	7′-2′′	10'-9''	6′-8′′	10'-0''				

Location Category B - All bars not in Location Category A.

= Non-epoxy coated

= Epoxy coated

and (b) one-half or less of the

total reinforcement is spliced

within the required lap splice

times the development length.

I. When bar lap is not specified on 5. These bar laps are Class B splices required by analysis over the based on the development lengths — entire length of the lap splice the Plans, the above dimensions shall be used. . These bar laps do not apply when bar is in lightweight concrete. Greater lengths are required for 6. Class A splices may be used when length. Class A splices are 1.0

this material. . These bar laps only apply where the General Notes indicate Reinforcing Steel Design, fy = 60

2". Greater lap lengths will be

required for cover less than 2".

3000 psi.

ksi, and Concrete Design, f'c = These bar laps assume cover of

in Det.No.REBAR-DL-101. Class B splices are l.3 times the development length. (a) the area of reinforcement provided is at least twice that

STATE OF MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION OFFICE OF STRUCTURES BAR LAP DIMENSIONS FOR GRADE 60 REINFORCING STEEL IN MIX NO.3 (3500 P.S.I.) CONCRETE DETAIL NO. REBAR-BL-101 SHEET ___ OF__

			LOCAT	TION CATEG	ORY A				
BAR			CEN	NTER TO CE	NTER SPAC	CING			
SIZE	3)''	4	"	5	"	>	≥ 6′′	
#4	2'-1''	2'-8''	2'-1''	2'-6''	2'-1''	2′-6′′	2'-1''	2′-6′	
#5	2'-8''	3′-6′′	2'-7''	3'-4''	2'-7''	3′-1′′	2'-7''	3′-1′′	
#6	3′-10′′	5′-0′′	3′-1′′	4'-0''	3′-1′′	4'-0''	3′-1′′	4'-0'	
#7	5'-3''	6′-10′′	3'-11''	5′-1′′	3'-7''	4'-8''	3′-7′′	4′-8′	
#8	6'-10''	8'-11''	5′-1′′	6′-8′′	4'-1''	5′-4′′	4'-1''	5′-4′	
#9	8'-8''	11'-3''	6′-6′′	8'-6''	5′-2′′	6'-9''	5′-I′′	6′-7′	
#10	-	-	8'-3''	10'-9''	6′-7′′	8'-7''	6'-3''	8'-2'	
#	-	-	10'-1''	13'-3''	8′- I ′′	10'-7''	7′-6′′	9'-9'	

of concrete below them such as in: footings, pier caps, etc.

	LOCATION CATEGORY B										
BAR		CENTER TO CENTER SPACING									
SIZE	3	"	4	"	5	,,	>	6''			
#4	I'-7''	2′-5′′	I'-7''	1'-11''	1'-7''	1'-11''	1'-7''	1'-11''			
#5	2'-1''	3′-1′′	2'-0''	3′-0′′	2'-0''	2′-5′′	2'-0''	2′-5′′			
#6	3′-0′′	4′-5′′	2′-5′′	3'-7''	2′-5′′	3′-7′′	2′-5′′	3′-7′′			
#7	4'-0''	6′-0′′	3′-0′′	4′-6′′	2'-9''	4'-2''	2'-9''	4'-2''			
#8	5′-3′′	7′-10′′	3′-11′′	5′-11′′	3'-2''	4′-9′′	3′-2′′	4′-9′′			
#9	6′-8′′	10'-0''	5′-0′′	7′-6′′	4'-0''	6′-0′′	3′-11′′	5′-10′′			
#10	-	-	6'-4''	9′-6′′	5′- I ′′	7′-7′′	4'-10''	7′-2′′			
#11	-	-	7′-10′′	11'-8''	6′-3′′	9′-4′′	5′-9′′	8′-8′′			

Location Category B - All bars not in Location Category A.

: Non-epoxy coated

the Plans, the above dimensions shall be used. These bar laps do not apply when bar is in lightweight concrete. this material.

the General Notes indicate

4000 psi.

ksi, and Concrete Design, f'c =

. These bar laps assume cover of

2". Greater lap lengths will be

required for cover less than 2".

in Det. No. REBAR-DL-103. Class B splices are 1.3 times the development length. Greater lengths are required for 6. Class A splices may be used when length. Class A splices are 1.0 These bar laps only apply where provided is at least twice that Reinforcing Steel Design, fy = 60

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION OFFICE OF STRUCTURES BAR LAP DIMENSIONS FOR GRADE 60 REINFORCING STEEL IN MIX NO.6 (4500 P.S.I.) CONCRETE

= Epoxy coated

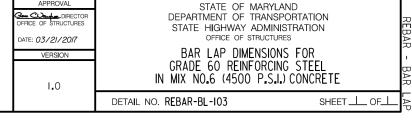
and (b) one-half or less of the

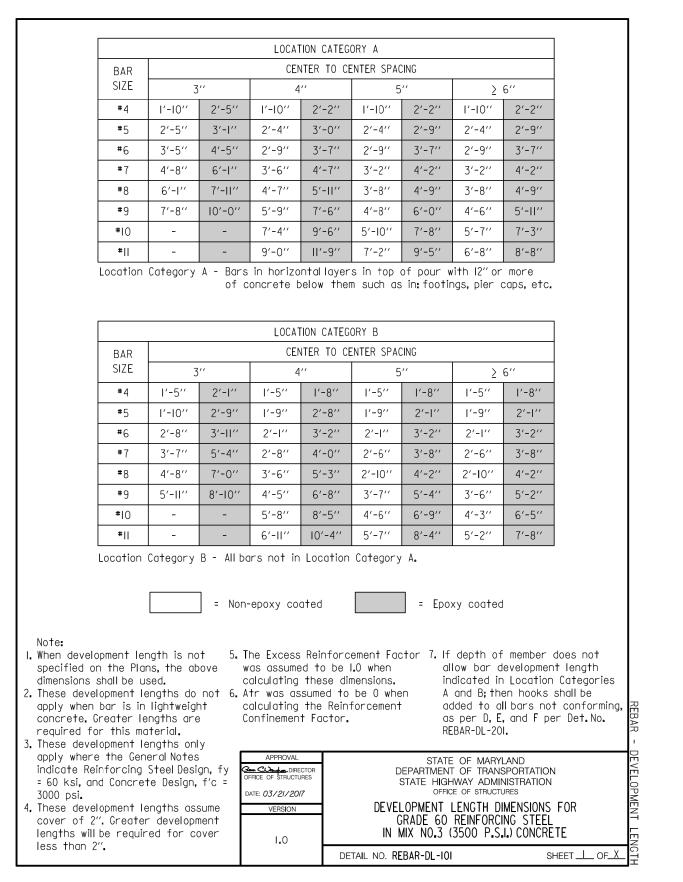
total reinforcement is spliced

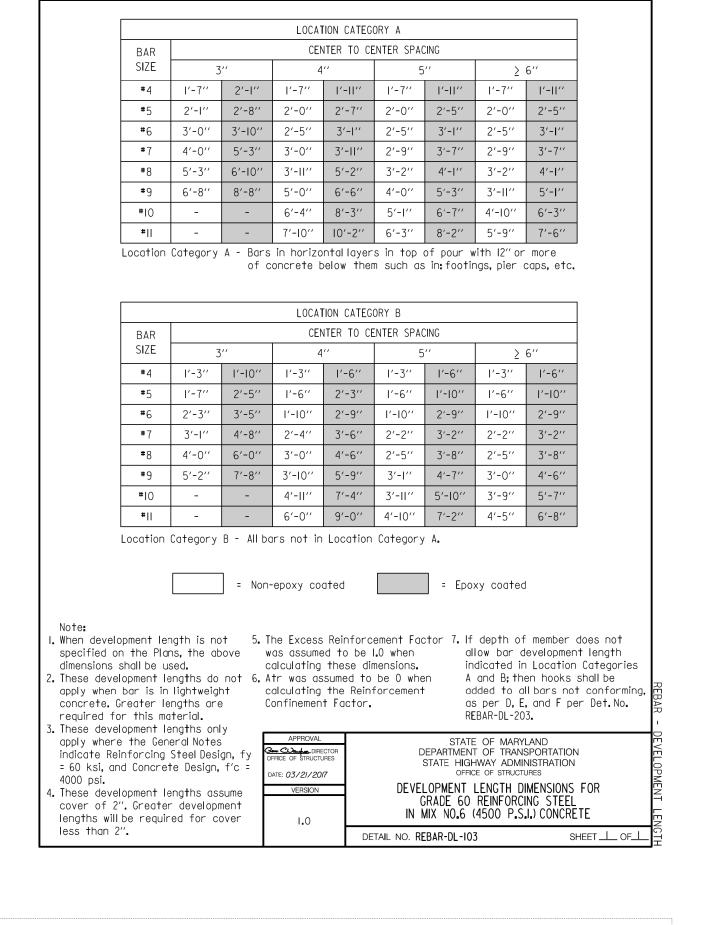
within the required lap splice

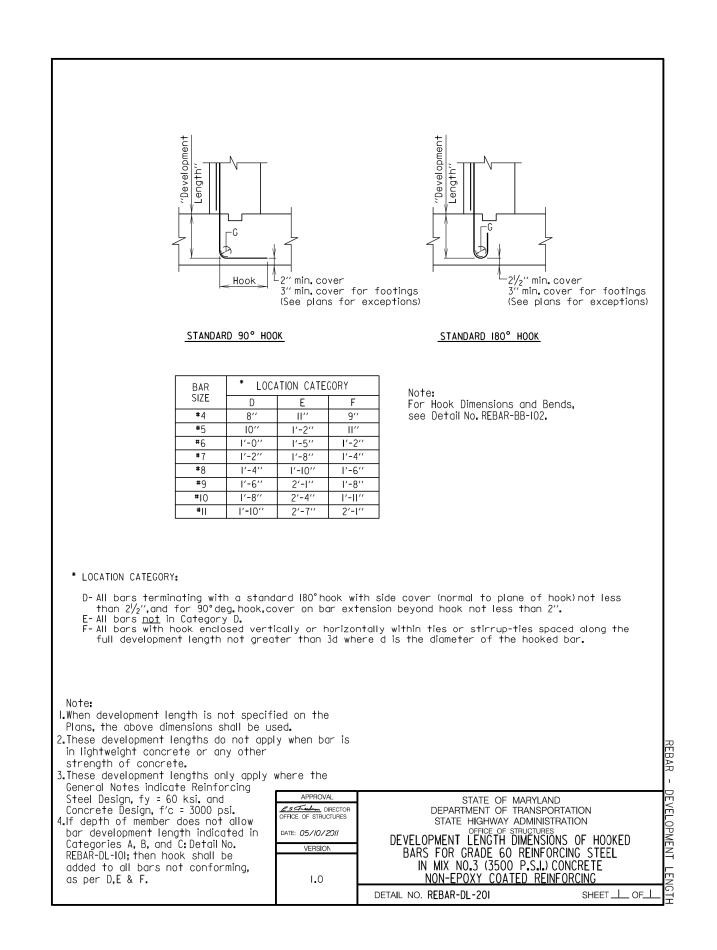
I. When bar lap is not specified on 5. These bar laps are Class B splices required by analysis over the based on the development lengths entire length of the lap splice

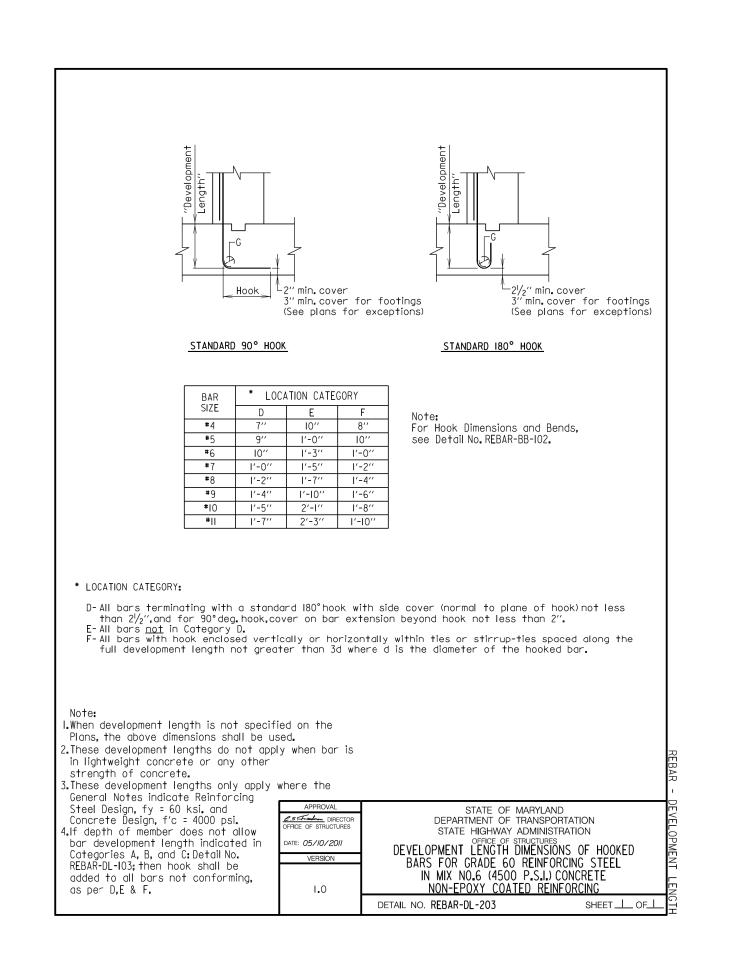
(a) the area of reinforcement times the development length.

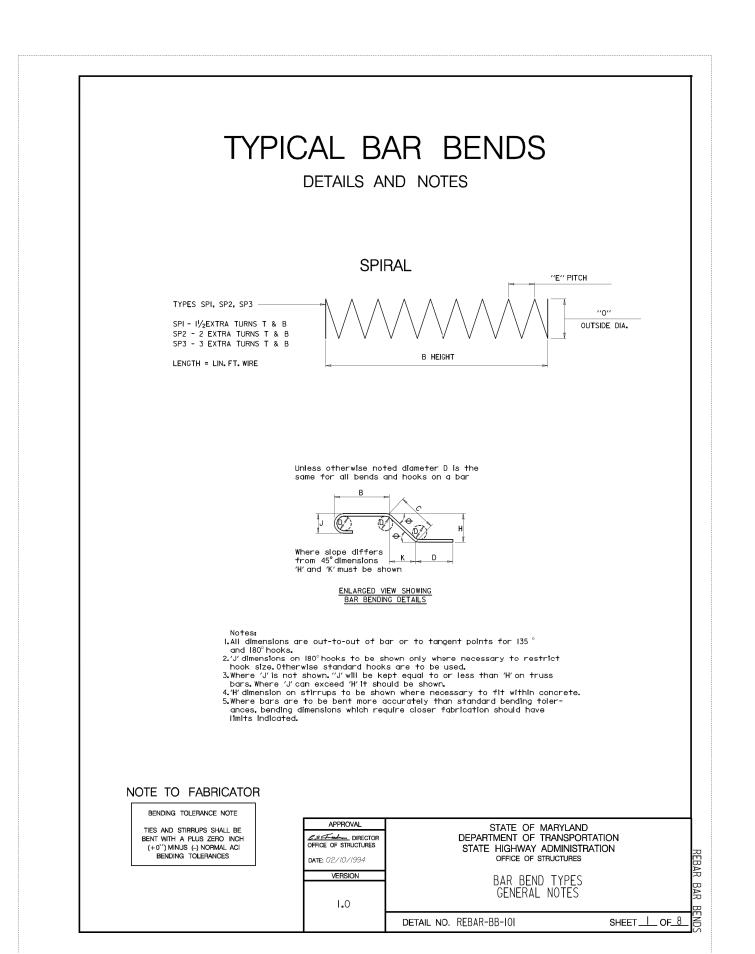


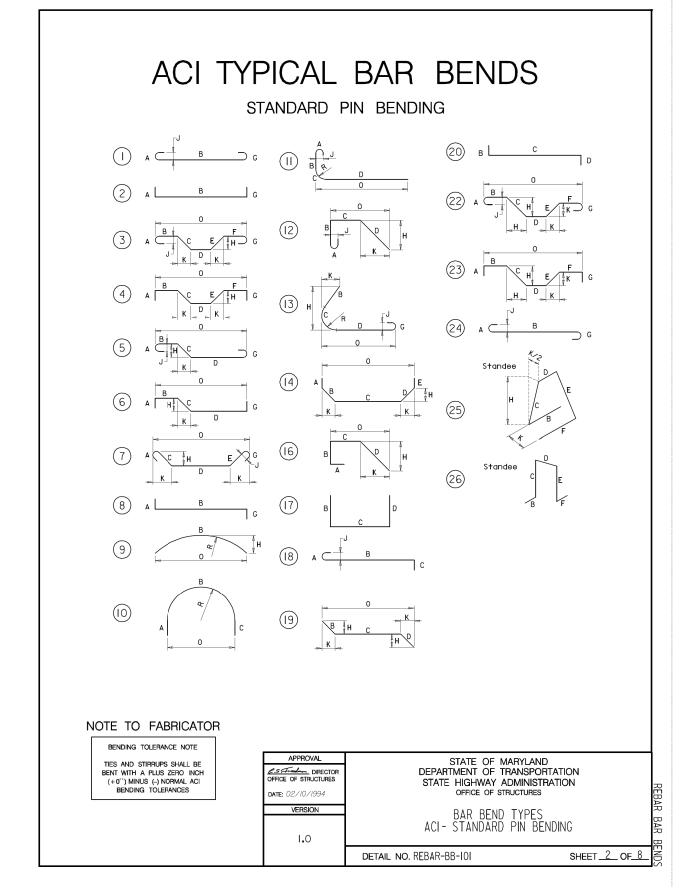












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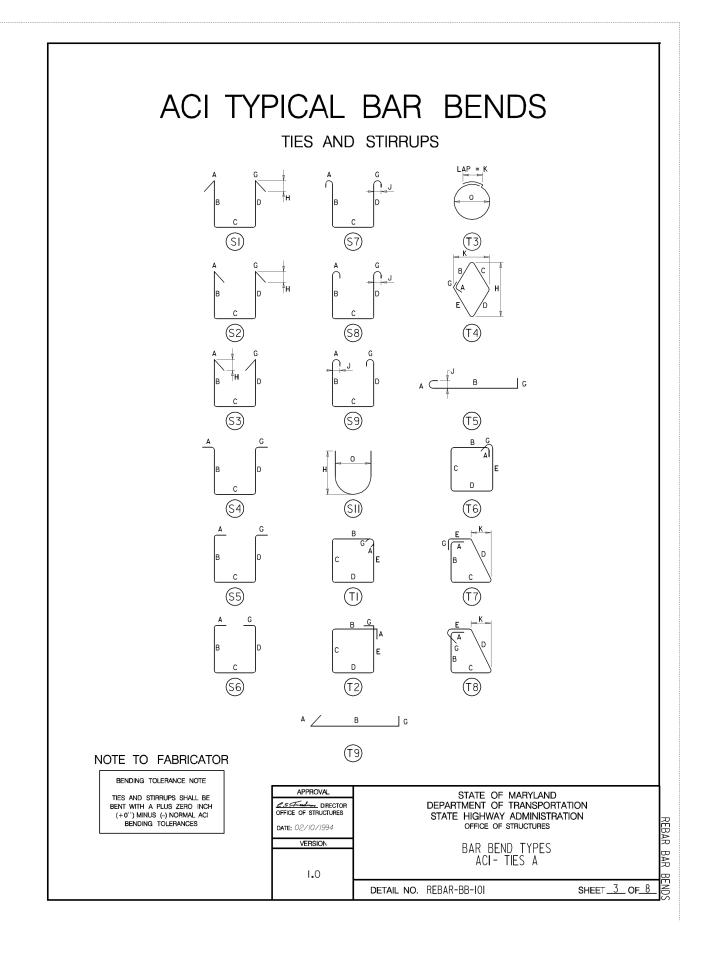
			MONTGOMERY COUNTY DEPARTMENT OF TRANSPORTATION GAITHERSBURG, MARYLAND	
			RECOMMENDED FOR APPROVAL	1
			Chief, Transportation Planning and Design Section Date APPROVED	
			Chief, Division of Transportation Engineering Date	SCAL
REVISION	DATE	BY	Designed by: <u>GSC</u> Drawn by: <u>GSC</u> Checked by: <u>AC</u>	Proj

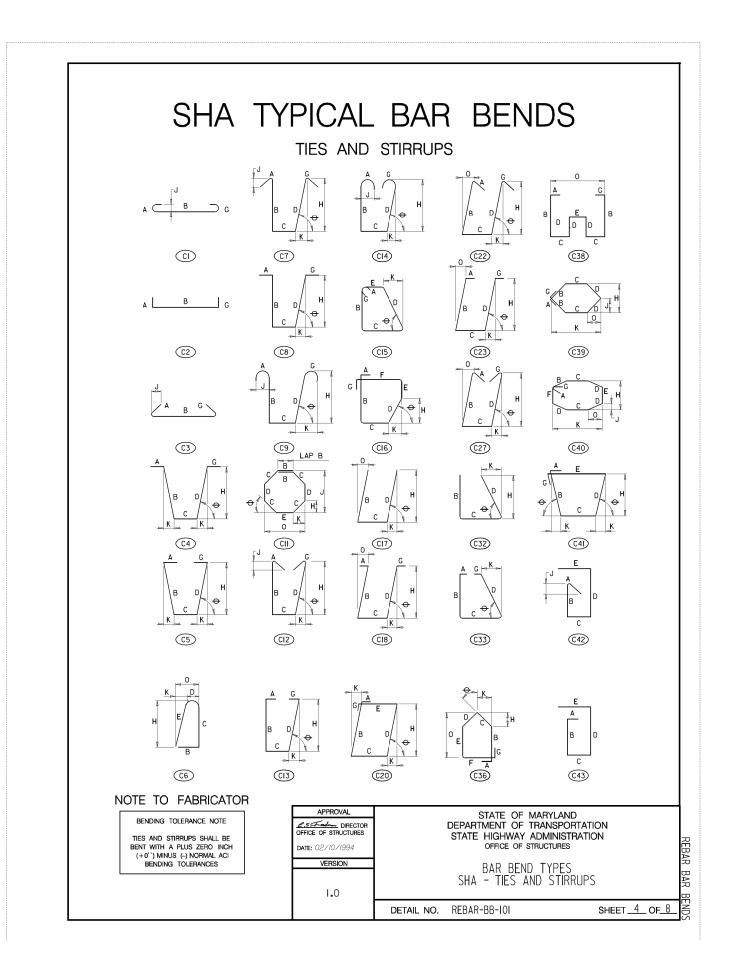
STRUCTURAL DETAILS - 2

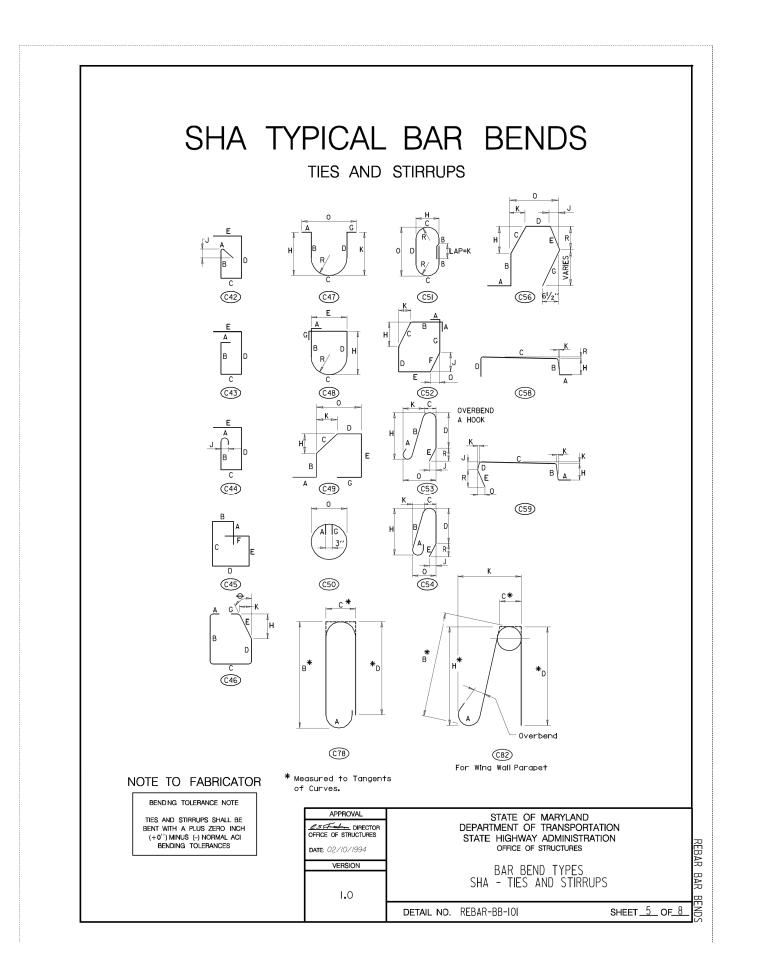
CAPITAL CRESCENT TRAIL UNDER MD 355

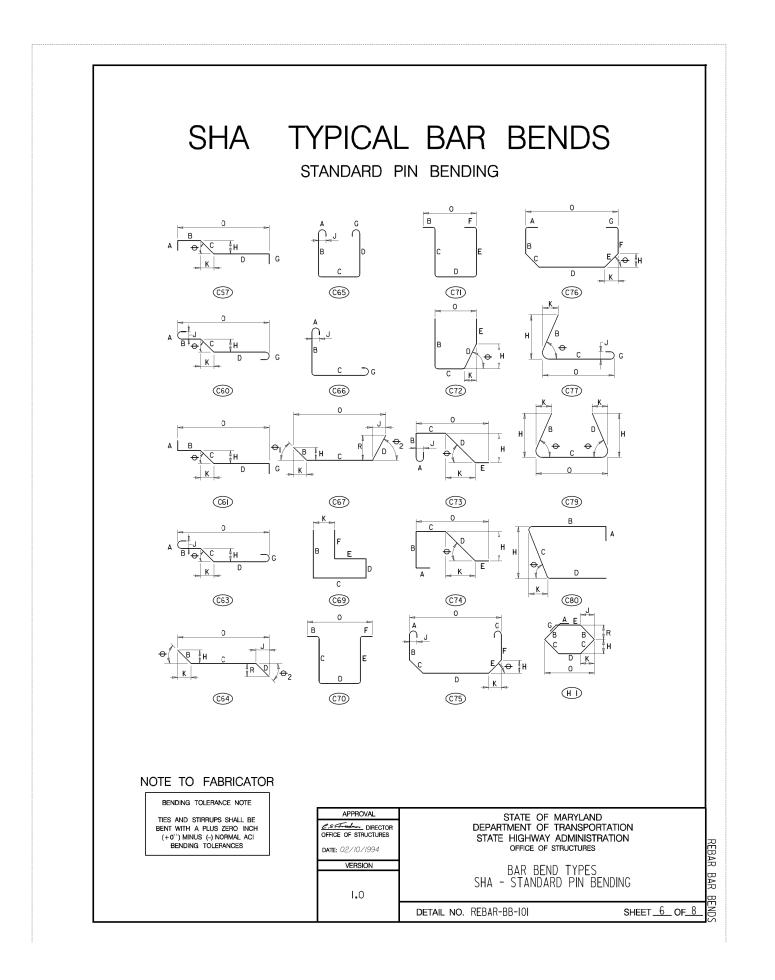
BETHESDA, MARYLAND MAY 2021 ALE : AS SHOWN Project No. : <u>501316</u>

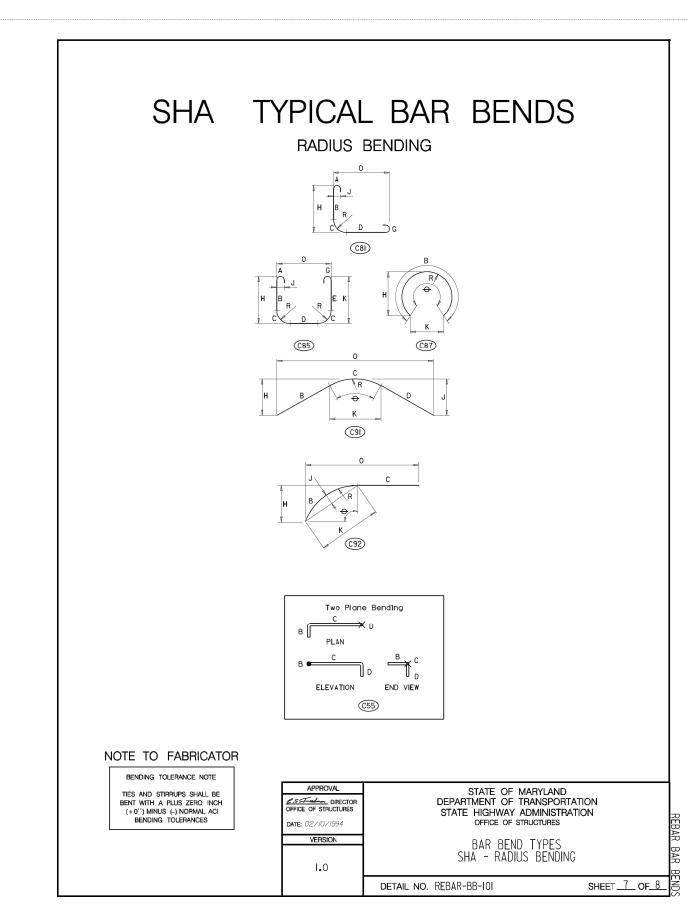
SHEET <u>105</u> of <u>169</u>

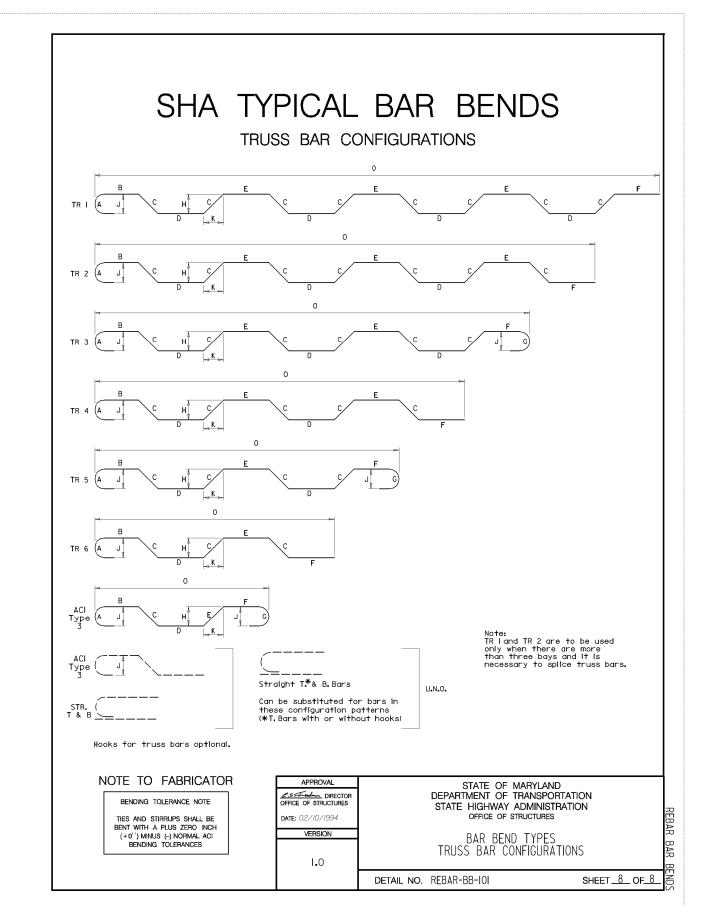


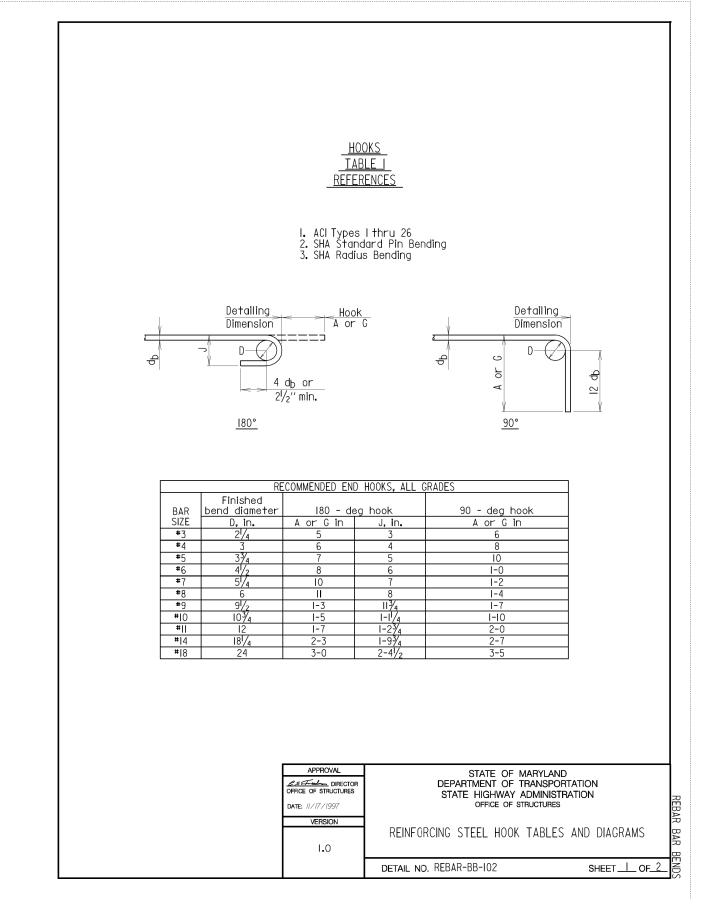


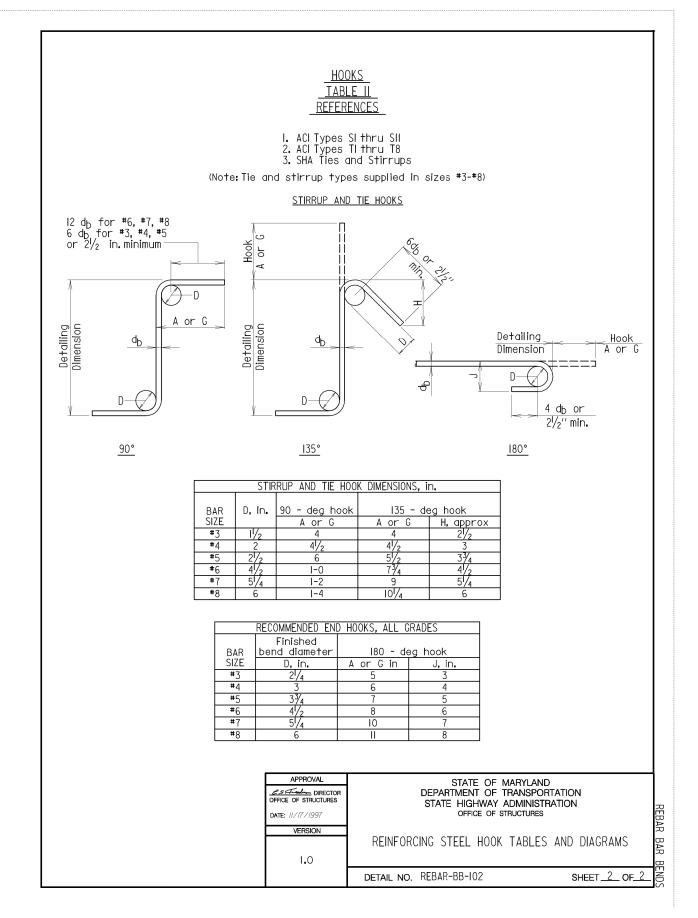








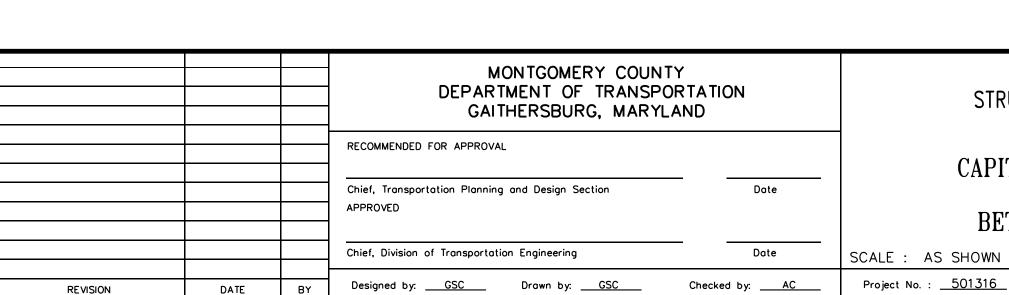




PROFESSIONAL CERTIFICATION.

I HEREBY CERTIFY THAT THESE DOCUMENTS
WERE PREPARED OR APPROVED BY ME, AND
THAT I AM A DULY LICENSED PROFESSIONAL
ENGINEER UNDER THE LAWS OF THE STATE
OF MARYLAND, LICENSE NO.
EXPIRATION DATE:





STRUCTURAL DETAILS - 3

CAPITAL CRESCENT TRAIL
UNDER MD 355

S-23

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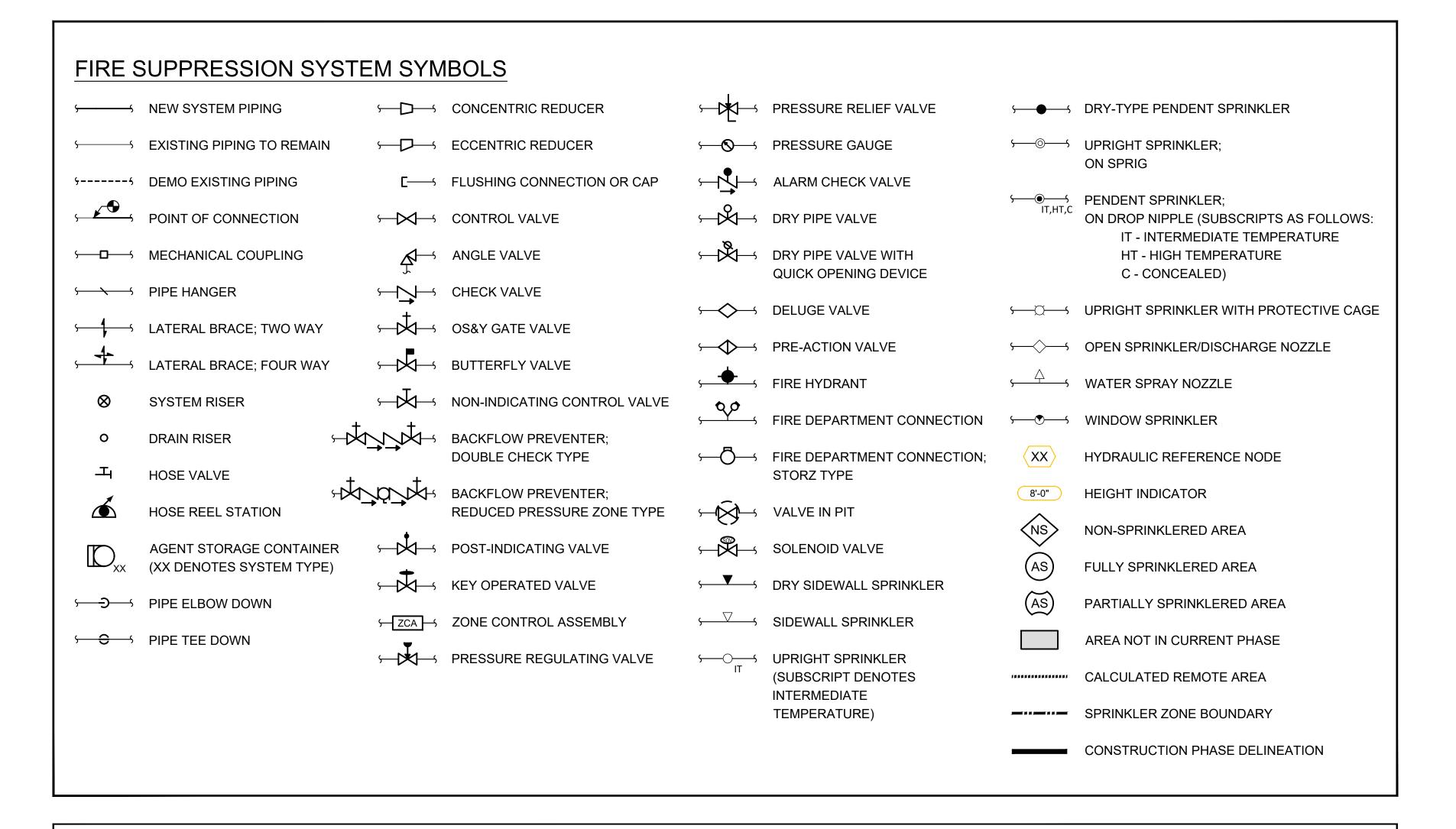
UNDER MD 355
BETHESDA, MARYLAND

SCALE : AS SHOWN MAY 2021

FIRE SUPPRESSION SYSTEM PROJECT NOTES:

- THIS PROJECT SHALL INCLUDE PROVIDING TWO DRY STANDPIPES TO SERVE HOSE VALVES WITHIN THE NEW PEDESTRIAN TUNNEL. THESE STANDPIPES SHALL BE SERVED BY NEW FREE STANDING FIRE DEPARTMENT CONNECTIONS.
- 2. PROVIDE ALL NECESSARY MATERIALS AND LABOR TO PROVIDE THE STANDPIPE AS DESCRIBED IN THE PROJECT SPECIFICATIONS AND CONTRACT DRAWINGS.
- 3. ALL REFERENCE TO THE AUTHORITY HAVING JURISDICTION (AHJ) SHALL MEAN THE MONTGOMERY COUNTY FIRE MARSHAL'S OFFICE.
- 4. ALL REFERENCE TO THE ENGINEER SHALL MEAN KOFFEL ASSOCIATES, INC.
- 5. INSTALLATION OF NEW SPRINKLER SYSTEM AND ASSOCIATED COMPONENTS SHALL BE IN ACCORDANCE WITH THE FOLLOWING:
 - NFPA 14. STANDARD FOR THE INSTALLATION OF
 - STANDPIPE AND HOSE SYSTEMS, 2013 EDITION
 NFPA 24, STANDARD FOR THE INSTALLATION OF PRIVATE FIRE SERVICE MAINS AND THEIR APPURTENANCES, 2013 EDITION
- NFPA 101[®], LIFE SAFETY CODE[®], 2015 EDITION
 INTERNATIONAL BUILDING CODE (IBC), 2015
- APPLICABLE LOCAL AND STATE CODES AND REGULATIONS
- THE MANUFACTURER'S REQUIREMENTS
- 6. EACH HOSE VALVE SHALL BE SERVED BY THE FIRE DEPARTMENT PUMPER TRUCK. PIPING SHALL BE SIZED TO ENSURE 250 GPM AT 100 PSI IS PROVIDED AT EACH HOSE VALVE.
- 7. AT THE COMPLETION OF INSTALLATION, A HYDROSTATIC TEST SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 11.4 OF NFPA 14 AND WITNESSED BY THE AHJ.
- 8. ALL WORK SHALL BE COORDINATED WITH THE TUNNEL SCHEDULING AND THE DESIGNATED PROJECT MANAGER.
- 9. ALL STANDPIPE WORK SHALL BE INSPECTED BY THE AH.I
- 10. STANDPIPE PIPE AND FITTINGS SHALL MEET THE FOLLOWING CRITERIA:
 - SCHEDULE 40, BLACK STEEL, MEETING ASTM A53 (TYPE E GRADE B) OR A795 (TYPE E GRADE A) SPECIFICATIONS, CONNECTED WITH THREADED FITTINGS.
- 14. ALL MATERIALS SHALL BE LISTED BY UNDERWRITERS LABORATORIES, INC. (U.L.) OR FACTORY MUTUAL (FM) FOR USE ON COMMERCIAL FIRE PROTECTION SYSTEMS.
- 15. PIPE FITTINGS SHALL INCLUDE:
- THREADED FITTINGS FOR SCHEDULE 40 PIPE SHALL CONFORM TO SECTION 6.4 OF NFPA 13.
- 16. HOSE VALVES SHALL BE DESIGNED AS THE LOW POINTS OF THE SYSTEM TO AVOID ADDITIONAL DRAIN REQUIREMENTS. IF LOW POINTS ARE PROVIDED WITHIN PIPING ARRANGEMENT, PROVIDE AUXILIARY DRAINS.

- 17. ALL HANGERS SHALL BE U.L. LISTED FOR USE WITH STANDPIPE SYSTEMS. HANGER INSTALLATION AND SPACING SHALL BE IN ACCORDANCE WITH NFPA 14.
- 18. DO NOT SUPPORT STANDPIPE FROM BOTTOM CHORD OF BAR JOISTS OR ROOF DECKING. SUPPORT OF STANDPIPE PIPE FROM TOP CHORD OF A BAR JOIST OR I-BEAM IS ACCEPTABLE.
- 19. PENETRATION OF FIRE-RATED ASSEMBLIES SHALL BE SEALED WITH A U.L. LISTED THROUGH-PENETRATION SYSTEM APPROPRIATE FOR THE RATING OF THE WALL PENETRATED.
- 20. WHEREVER POSSIBLE, ALL STANDPIPE SYSTEM PIPING AND HANGERS SHALL BE CONCEALED. PROVIDE ACCESS PANELS FOR ALL VALVES, WHERE REQUIRED.
- 21. UNO, ALL EXPOSED STANDPIPE SYSTEM PIPE SHALL BE PAINTED RED.
- 22. ALL CONCEALED STANDPIPE SYSTEM PIPE SHALL BE LABELED USING STENCILS OR COMMERCIALLY AVAILABLE WRAP AROUND PIPE IDENTIFICATION SIGNS. LETTERING SHALL BE ½" IN HEIGHT AND MARKED EVERY 20 FEET.
- 23. ALL UNDERGROUND PIPING SHALL BE DESIGNED TO MEET REQUIREMENTS OF NFPA 24 FOR PIPE PROTECTION, SUPPORT, ETC.



FIRE SUPPRESSION ABBREVIATIONS

ABD	AUTOMATIC BALL DRIP	CPVC	CHLORINATED POLYVINYL	FPC	FIRE PUMP CONTROLLER	PL	PLASTER (CEILING)
ACT	ACOUSTICAL CEILING TILE		CHLORIDE	GALV	GALVANIZED	PMO	FIRE PUMP CONTROLLER - MANUAL OFF
AFF	ABOVE FINISHED FLOOR	DCH	DRY CHEMICAL	GYP	GYPSUM WALL BOARD (SHEETROCK)	POC	POINT OF CONNECTION
AFFF	AQUEOUS FILM FORMING FOAM	DI	DUCTILE IRON	HL	HALON SYSTEM	PR	FIRE PUMP RUN
AS	AUTOMATIC SPRINKLER	DL	DELUGE	HT	HIGH TEMPERATURE (SPRINKLER)	PRV	PRESSURE REGULATING VALVE
ASC	AGENT STORAGE CONTAINER	DN	DOWN	ITC	INSPECTORS TEST CONNECTION	QR	QUICK RESPONSE (SPRINKLER)
ATR	ALL THREAD ROD	DP	DRY PENDENT (SPRINKLER)	JP	JOCKEY PUMP	RX	REMOVE EXISTING DEVICE
BFP	BACKFLOW PREVENTER	DS	DRY SIDEWALL (SPRINKLER)	JPC	JOCKEY PUMP CONTROLLER	SCH	SCHEDULE
ВОВ	BOTTOM OF BEAM	EC	EXTENDED COVERAGE (SPRINKLER)	MAX	MAXIMUM	SPL	HIDDEN SPLINE (CEILING)
CA	CLEAN AGENT	ETR	EXISTING TO REMAIN	MIN	MINIMUM	STL	STEEL
СВ	CONCRETE BEAM	EXP	EXPOSED (NO CEILING)	MT	METAL TILE	T&G	TONGUE AND GROOVE
CI	CAST IRON	FD	FLOOR DRAIN	NIC	NOT IN CONTRACT	TYP	TYPICAL
CNC	COULD NOT CHECK	FDC	FIRE DEPARTMENT CONNECTION	NS	NON-SPRINKLERED	UNO	UNLESS NOTED OTHERWISE
CO2	CARBON DIOXIDE	FHV	FIRE HOSE VALVE	NTS	NOT TO SCALE	WC	WET CHEMICAL SYSTEM
COL	COLUMN	FO	FOAM	PF	FIRE PUMP POWER FAIL	WM	WATER MIST SYSTEM
CONC	CONCRETE	FP	FIRE PUMP	PH	FIRE PUMP PHASE REVERSAL		

	FIRE SPRINKLER (KOFFEL ASSOC.)
DWG#	DRAWING NAME
FS001	FIRE SUPPRESSION NOTES, SYMBOLS, AND ABBREVIATIONS
FS002	FIRE SUPPRESSION SPECS
FS100	FIRE SUPPRESSION PLAN - UNDERGROUND
FS101	FIRE SUPPRESSION PLAN - STREET LEVEL
FS500	FIRE SUPPRESSION DETAILS

PROFESSIONAL CERTIFICATION.

I HEREBY CERTIFY THAT THESE DOCUMENTS

WERE PREPARED OR APPROVED BY ME, AND

THAT I AM A DULY LICENSED PROFESSIONAL

ENGINEER UNDER THE LAWS OF THE STATE

OF MARYLAND, LICENSE NO.

EXPIRATION DATE:

8815 Centre Park Drive, Suite 200 Columbia, Maryland 21045 410-750-2246 / www.koffel.com MONTGOMERY COUNTY
DEPARTMENT OF TRANSPORTATION
GAITHERSBURG, MARYLAND

RECOMMENDED FOR APPROVAL

Chief, Transportation Planning and Design Section
APPROVED

Chief, Division of Transportation Engineering

Date

SCALE:

NO. REVISION
DATE BY Designed by: KSW_____ Drawn by: CRS_____ Checked by: CPA

Project No.: 501316

FIRE SUPPRESSION NOTES, SYMBOLS, AND ABBREVIATIONS

CAPITAL CRESCENT TRAIL UNDER MD 355 BETHESDA, MARYLAND

FEBRUARY 2020

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SECTION 21 12 00

STANDPIPE SYSTEMS

PART 1 GENERAL

1.1 REFERENCES

THE PUBLICATIONS LISTED BELOW FORM A PART OF THIS SPECIFICATION TO THE EXTENT REFERENCED. THE PUBLICATIONS ARE REFERRED TO WITHIN THE TEXT BY THE BASIC DESIGNATION ONLY.

AMERICAN WATER WORKS ASSOCIATION (AWWA)

AWWA C651 (2014) STANDARD FOR DISINFECTING WATER

ASTM INTERNATIONAL (ASTM)

ASTM C1036 (2016) STANDARD SPECIFICATION FOR FLAT

FM GLOBAL (FM)

(UPDATED ON-LINE) APPROVAL GUIDE FM APP GUIDE HTTP://WWW.APPROVALGUIDE.COM/

FOUNDATION FOR CROSS-CONNECTION CONTROL AND HYDRAULIC RESEARCH (FCCCHR)

FCCCHR LIST (CONTINUOUSLY UPDATED) LIST OF APPROVED

BACKFLOW PREVENTION ASSEMBLIES

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 13 (2013; WITH ALL ERRATA) STANDARD FOR THE

INSTALLATION OF SPRINKLER SYSTEMS NFPA 14 (2013) STANDARD FOR THE INSTALLATION OF

STANDPIPES AND HOSE SYSTEMS

NFPA 70 (2014) NATIONAL ELECTRICAL CODE

LABORATORIES (UL)

UL FIRE PROT DIR (2012) FIRE PROTECTION EQUIPMENT DIRECTORY

1.2 RELATED REQUIREMENTS

SECTION 23 03 00.00 20 BASIC MECHANICAL MATERIALS AND METHODS APPLIES TO THIS SECTION WITH ADDITIONS AND MODIFICATIONS SPECIFIED HEREIN.

CODE UNDERWRITERS

1.3 SYSTEM DESCRIPTION

DESIGN AND PROVIDE NEW MANUAL DRY CLASS I STANDPIPE SYSTEM AS SHOWN IN DRAWING SET.

1.4 SYSTEM DESCRIPTION

SYSTEM DESIGN AND MANUFACTURER'S PRODUCTS SHALL BE IN ACCORDANCE WITH THE REQUIRED AND ADVISORY PROVISIONS OF NFPA 14 EXCEPT AS MODIFIED HEREIN. STANDPIPE SYSTEM SHALL BE DESIGNED BY HYDRAULIC CALCULATIONS.

EACH SYSTEM SHALL INCLUDE MATERIALS, ACCESSORIES, AND EQUIPMENT INSIDE AND OUTSIDE THE BUILDING NECESSARY TO PROVIDE EACH SYSTEM COMPLETE AND READY FOR USE.

DEVICES AND EQUIPMENT SHALL BE UL FIRE PROT DIR LISTED OR FM APP GUIDE APPROVED FOR FIRE PROTECTION SERVICE. REFERENCE TO THE "AUTHORITY HAVING JURISDICTION" SHALL BE INTERPRETED TO MEAN MONTGOMERY COUNTY OFFICIALS.

1.4.1 RESIDUAL PRESSURE

THE MINIMUM RESIDUAL PRESSURE AT THE OUTLET OF THE MOST REMOTE 64 MM HOSE CONNECTION SHALL BE (689.5 KPA) 100 PSIG WHILE THE SYSTEM IS DISCHARGING AT THE REQUIRED DESIGN FLOW RATES.

1.4.2 FRICTION LOSSES

CALCULATE LOSSES IN PIPING IN ACCORDANCE WITH THE HAZEN-WILLIAMS FORMULA WITH 'C' VALUE OF 120 FOR STEEL PIPING, 150 FOR COPPER TUBING, AND 140 FOR CEMENT-LINED DUCTILE-IRON PIPING.

1.4.3 WATER SUPPLY

COORDINATE WITH MONTGOMERY COUNTY FIRE DEPARTMENT TO DETERMINE THE PROVIDED FLOW AND PRESSURE FROM THEIR FIRE PUMPERS IN THIS AREA. THIS MAY REQUIRE THE CONTRACTOR TO PERFORM A FLOW TEST TO DETERMINE THE WATER SUPPLY IN THIS AREA IF A FLOW TEST REPORT CANNOT BE PRODUCED THAT IS LESS THAN A YEAR OLD.

1.4.4 STANDPIPE SYSTEM DRAWNGS

PREPARE IN ACCORDANCE WITH THE REQUIREMENTS FOR "PLANS AND SPECIFICATIONS" AS SPECIFIED IN NFPA 14. EACH DRAWING SHALL BE 34 BY 22 INCHES. PLANS SHALL BE DRAWN TO A SCALE NOT LESS THAN 1/8 INCH SCALE DO NOT COMMENCE WORK UNTIL THE DESIGN OF EACH SYSTEM AND THE VARIOUS COMPONENTS HAVE BEEN APPROVED. SHOW DATA ESSENTIAL FOR PROPER INSTALLATION OF EACH SYSTEM. SHOW DETAILS, PLAN VIEW, ELEVATIONS, AND SECTIONS OF THE SYSTEMS SUPPLY AND PIPING. SHOW PIPING SCHEMATIC OF SYSTEMS SUPPLY, DEVICES, VALVES, PIPE, AND FITTINGS.

SUBMIT SHOP DRAWINGS SIGNED AND SELAED BY A PROFESSIONAL ENGINEER OR PROVIDE THE APPROPRIATE NICET REQUIREMENTS PER MONTGOMERY COUNTY CODES

SHOW ROOM, SPACE OR AREA LAYOUT AND INCLUDE PIPE SUPPORTS AND

1.5 SUBMITTALS

IT IS RECOMMENDED THAT THE DESIGN TEAM WILL REVIEW ANY APPROVE ALL SUBMITTALS IN THIS SECTION PRIOR TO PERMIT

SD-02 SHOP DRAWINGS SD-03 PRODUCT DATA

> DATA WHICH DESCRIBES MORE THAN ONE TYPE OF ITEM SHALL BE CLEARLY MARKED TO INDICATE WHICH TYPE THE CONTRACTOR INTENDS TO PROVIDE. SUBMIT ONE ORIGINAL FOR EACH ITEM AND CLEAR, LEGIBLE, FIRST-GENERATION PHOTOCOPIES FOR THE REMAINDER OF THE SPECIFIED COPIES. INCOMPLETE OR ILLEGIBLE PHOTOCOPIES WILL NOT BE ACCEPTED. PARTIAL SUBMITTALS WILL NOT BE ACCEPTED.

SD-06 TEST REPORTS INCLUDING PRELIMINARY AND ACCEPTANCE TESTING

SD-07 CERTIFICATES/ QUALIFICATIONS OF INSTALLER

SD-10 OPERATION AND MAINTENANCE DATA

SUBMIT IN ACCORDANCE WITH SECTION 01 78 23 OPERATION AND MAINTENANCE DATA. FURNISH ONE COMPLETE PACKAGE PRIOR TO THE TIME THAT FINAL ACCEPTANCE TESTS ARE PERFORMED, AND FURNISH THE REMAINING BEFORE THE CONTRACT IS COMPLETED. INSCRIBE THE FOLLOWING IDENTIFICATION ON THE COVER: THE WORDS OPERATION AND MAINTENANCE MANUAL, THE LOCATION OF THE BUILDING, THE NAME OF THE CONTRACTOR, SYSTEM MANUFACTURER AND THE CONTRACT NUMBER. THE INSTRUCTIONS SHALL BE LEGIBLE AND EASILY READ, WITH LARGE SHEETS OF DRAWINGS FOLDED IN. THE PACKAGE SHALL INCLUDE: SCHEMATIC DRAWINGS SHOWING PIPING; CIRCUIT DRAWINGS; INSTALLATION INSTRUCTIONS; MAINTENANCE INSTRUCTIONS; SAFETY PRECAUTIONS, DIAGRAMS, AND ILLUSTRATIONS; TEST PROCEDURES; PERFORMANCE DATA; AND PARTS LIST.

SD-11 SYSTEM AS-BUILT DRAWINGS. REDLINES SHALL NOT BE ACCEPTABLE

1.6 QUALITY ASSURANCE

1.6.1 QUALIFICATIONS OF INSTALLER

PRIOR TO COMMENCING WORK, SUBMIT DATA SHOWING THAT THE CONTRACTOR HAS SUCCESSFULLY INSTALLED FIRE EXTINGUISHING STANDPIPE SYSTEMS OF THE SAME TYPE AND DESIGN AS SPECIFIED HEREIN. OR THAT HE HAS A FIRM CONTRACTUAL AGREEMENT WITH A SUBCONTRACTOR HAVING THE REQUIRED EXPERIENCE.

INCLUDE THE NAMES AND LOCATIONS OF AT LEAST TWO INSTALLATIONS WHERE THE CONTRACTOR, OR THE SUBCONTRACTOR REFERRED TO ABOVE, HAS INSTALLED SUCH SYSTEMS. INDICATE THE TYPE AND DESIGN OF EACH SYSTEM, AND CERTIFY THAT THE SYSTEM HAS PERFORMED SATISFACTORILY FOR A PERIOD OF AT LEAST 18 MONTHS.

QUALIFICATIONS OF SYSTEM TECHNICIAN: INSTALLATION DRAWINGS, SHOP DRAWING AND AS-BUILT DRAWINGS SHALL BE PREPARED, BY OR UNDER THE SUPERVISION OF, AN INDIVIDUAL WHO IS EXPERIENCED WITH THE TYPES OF WORKS SPECIFIED HEREIN, AND IS CURRENTLY CERTIFIED BY THE NATIONAL INSTITUTE FOR CERTIFICATION IN ENGINEERING TECHNOLOGIES (NICET) AS AN ENGINEERING TECHNICIAN WITH MINIMUM LEVEL-III CERTIFICATION IN AUTOMATIC SPRINKLER SYSTEM PROGRAM.

CONTRACTOR SHALL SUBMIT DATA FOR APPROVAL SHOWING THE NAME AND CERTIFICATION OF ALL INVOLVED INDIVIDUALS WITH SUCH QUALIFICATIONS AT OR PRIOR TO SUBMITTAL OF DRAWINGS.

1.6.2 SYSTEM AS-BUILT DRAWINGS

UPON COMPLETION, AND BEFORE FINAL ACCEPTANCE OF THE WORK, SUBMIT A COMPLETE SET OF AS-BUILT DRAWINGS OF EACH SYSTEM. SUBMIT 34 BY 22 INCH REPRODUCIBLE AS-BUILT DRAWINGS WITH TITLE BLOCK SIMILAR TO FULL SIZE CONTRACT DRAWINGS.

1.7 DELIVERY, STORAGE AND HANDLING

PROTECT STORED EQUIPMENT FROM WEATHER, HUMIDITY AND TEMPERATURE VARIATIONS, DIRT, DUST, AND OTHER CONTAMINANTS.

WaltMiller PEStamp.tif

PART 2 PRODUCTS

2.1 ABOVEGROUND PIPING SYSTEMS

PROVIDE FITTINGS FOR CHANGES IN DIRECTION OF PIPING AND FOR CONNECTIONS. MAKE CHANGES IN PIPING SIZES THROUGH TAPERED REDUCING PIPE FITTINGS; BUSHINGS WILL NOT BE PERMITTED.

PERFORM WELDING IN THE SHOP; FIELD WELDING WILL NOT BE PERMITTED. CONCEAL PIPING IN AREAS WITH SUSPENDED CEILING.

2.1.1 PIPE AND FITTINGS

NFPA 14, EXCEPT AS MODIFIED HEREIN. STEEL PIPING SHALL BE SCHEDULE 40 FOR ALL SIZES OF PIPE IN THIS PROJECT. FITTINGS SHALL BE WELDED, THREADED, OR GROOVED-END TYPE. PLAIN-END FITTINGS WITH MECHANICAL COUPLINGS AND FITTINGS WHICH USE STEEL GRIPPING DEVICES TO BITE INTO THE PIPE WHEN PRESSURE IS APPLIED WILL NOT BE PERMITTED. RUBBER GASKETED GROOVED-END PIPE AND FITTINGS WITH MECHANICAL COUPLINGS SHALL BE PERMITTED IN PIPE SIZES (40 MM) 1.5 INCHES AND LARGER. FITTINGS SHALL BE UL FIRE PROT DIR LISTED OR FM APP GUIDE APPROVED FOR USE IN DRY PIPE SPRINKLER SYSTEMS.

FITTINGS, MECHANICAL COUPLINGS, AND RUBBER GASKETS SHALL BE SUPPLIED BY THE SAME MANUFACTURER. SIDE OUTLET TEES USING RUBBER GASKETED FITTINGS SHALL NOT BE PERMITTED. PIPE AND FITTINGS SHALL BE METAL.

2.1.2 PIPE HANGERS AND SUPPORTS

PROVIDE IN ACCORDANCE WITH NFPA 14.

2.1.3 VALVES

PER NFPA 14.PROVIDE VALVES OF TYPES APPROVED FOR FIRE SERVICE. HOSE AND GATE VALVES SHALL OPEN BY COUNTERCLOCKWISE ROTATION.

2.1.3.1 HOSE VALVES

PROVIDE BRONZE HOSE VALVE WITH (65 MM) 2 1/2 INCH NATIONAL STANDARD MALE HOSE THREADS, AND (65 MM) 2 1/2 INCH NH FEMALE BY (40 MM) 1 1/2 INCH IPT MALE REDUCER WITH CAP AND CHAIN.

2.1.4 IDENTIFICATION SIGNS

NFPA 14.ATTACH PROPERLY LETTERED AND APPROVED METAL SIGNS TO EACH VALVE AND FIRE DEPARTMENT CONNECTION.

2.1.5 PIPE SLEEVES

PROVIDE WHERE PIPING PASSES ENTIRELY THROUGH WALLS, FLOORS, ROOFS AND PARTITIONS. SECURE SLEEVES IN POSITION AND LOCATION DURING CONSTRUCTION. PROVIDE SLEEVES OF SUFFICIENT LENGTH TO PASS THROUGH ENTIRE THICKNESS OF WALLS, FLOORS, ROOFS AND PARTITIONS.PROVIDE ONE INCH MINIMUM CLEARANCE BETWEEN EXTERIOR OF PIPING AND INTERIOR OF SLEEVE OR CORE-DRILLED HOLE.

FIRMLY PACK SPACE WITH MINERAL WOOL INSULATION. SEAL SPACE AT BOTH ENDS OF THE SLEEVE OR CORE-DRILLED HOLE WITH PLASTIC WATERPROOF CEMENT WHICH WILL DRY TO A FIRM BUT PLIABLE MASS, OR PROVIDE A MECHANICALLY ADJUSTABLE SEGMENTED ELASTOMERIC SEAL. IN FIRE WALLS AND FIRE FLOORS, SEAL BOTH ENDS OF PIPE SLEEVES OR CORE-DRILLED HOLES WITH UL LISTED FILL, VOID, OR CAVITY MATERIAL.

2.1.5.1 SLEEVES IN MASONRY AND CONCRETE WALLS. FLOORS AND ROOFS

PROVIDE HOT-DIP GALVANIZED STEEL, DUCTILE-IRON, OR CAST-IRON SLEEVES. CORE DRILLING OF MASONRY AND CONCRETE MAY BE PROVIDED IN LIEU OF PIPE SLEEVES WHEN CAVITIES IN THE CORE-DRILLED HOLE ARE COMPLETELY GROUTED SMOOTH.

EXTEND SLEEVES IN FLOOR SLABS 76 MM 3 INCHES ABOVE FINISHED FLOORS.

2.1.6 ESCUTCHEON PLATES

PROVIDE ONE PIECE OR SPLIT HINGE TYPE METAL PLATES FOR PIPING PASSING THROUGH WALLS, FLOORS, AND CEILINGS IN BOTH EXPOSED AND CONCEALED SPACES. PROVIDE POLISHED STAINLESS STEEL PLATES OR CHROMIUM-PLATED FINISH ON COPPER ALLOY PLATES IN FINISHED SPACES. PROVIDE PAINT FINISH ON METAL PLATES IN UNFINISHED SPACES. SECURELY ANCHOR PLATES IN PLACE.

2.1.7 FIRE DEPARTMENT CONNECTIONS

PROFESSIONAL CERTIFICATION.

OF MARYLAND, LICENSE NO.

EXPIRATION DATE:

PROVIDE CONNECTIONS APPROXIMATELY (ONE METER) 3 FEET ABOVE FINISH GRADE, OF THE APPROVED TWO-WAY TYPE WITH 65 MM) 2.5 INCH NATIONAL STANDARD FEMALE HOSE THREADS WITH PLUG, CHAIN, AND IDENTIFYING FIRE DEPARTMENT CONNECTION ESCUTCHEON PLATE.

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2.1.8 FIRE HOSE VALVE CABINETS

PROVIDE RECESSED CABINETS WHERE INDICATED. CABINETS SHALL BE PRIME GRADE, COLD-ROLLED, REANNEALED, PROCESS-LEVELED, FURNITURE STEEL. FABRICATE CABINET FROM 20 GAGE STEEL AND DOOR AND TRIM FROM 18 GAGE STEEL. PROVIDE FULLY WELDED JOINTS GROUND SMOOTH.ON EACH JAMB, PROVIDE AT LEAST TWO ANCHORS OR REINFORCEMENTS SPACED APPROXIMATELY (610 MM) 24 INCHES APART FOR BUILDING IN OR ATTACHING THE CABINETS TO ADJACENT CONSTRUCTION.

DOORS SHALL BE FLUSH HOLLOW METAL TYPE WITH FULLY WELDED JOINTS GROUND SMOOTH AND FULL GLAZED OPENING. PROVIDE DOOR WITH CONTINUOUS HINGE, LATCH AND PULL.HINGE DOOR FOR 180 DEGREE OPENING. FACTORY FINISH CABINET INSIDE AND OUT WITH ONE COAT OF ENAMEL APPLIED OVER A PRIMER. INTERIOR FINISH COLOR SHALL BE WHITE. EXTERIOR FINISH SHALL BE RED.

SIGNAGE SHALL BE PROVIDED ABOVE TO IDENTIFY FIRE DEPARTMENT HOSE VALVE CABINET.

PART 3 EXECUTION

3.1 EXCAVATION, BACKFILLING, AND COMPACTING

PROVIDE UNDER THIS SECTION AS SPECIFIED IN SECTION 31 00 00 EARTHWORK.

3.2 STANDPIPE SYSTEM INSTALLATION

EQUIPMENT, MATERIALS, INSTALLATION, WORKMANSHIP, FABRICATION, ASSEMBLY, ERECTION, EXAMINATION, INSPECTION, AND TESTING SHALL BE IN ACCORDANCE WITH THE NFPA STANDARDS REFERENCED HEREIN. INSTALL PIPING STRAIGHT AND TRUE TO BEAR EVENLY ON HANGERS AND SUPPORTS. CONCEAL PIPING TO THE MAXIMUM EXTENT POSSIBLE. PIPING SHALL BE INSPECTED, TESTED AND APPROVED BEFORE BEING CONCEALED. PROVIDE FITTINGS FOR CHANGES IN DIRECTION OF PIPING AND FOR ALL CONNECTIONS MAKE CHANGES IN PIPING SIZES THROUGH STANDARD REDUCING PIPE FITTINGS; DO NOT USE BUSHINGS. CUT PIPE ACCURATELY AND WORK INTO PLACE WITHOUT SPRINGING OR FORCING. REAM PIPE ENDS AND FREE PIPE AND FITTINGS FROM BURRS. CLEAN WITH SOLVENT TO REMOVE ALL VARNISH AND CUTTING OIL PRIOR TO ASSEMBLE. MAKE SCREW JOINTS WITH PTFE TAPE APPLIED TO MALE THREAD ONLY.

3.3 FIELD PAINTING

FIELD PAINTING OF FIRE EXTINGUISHING STANDPIPE SYSTEM WITH CUSTOM COLOR AS PRESCRIBED AND APPROVED BY THE ARCHITECT.

3.4 FLUSHING

FLUSH THE PIPING SYSTEM WITH POTABLE WATER IN ACCORDANCE WITH NFPA 14. CONTINUE FLUSHING OPERATION UNTIL WATER IS CLEAR, BUT FOR NOT LESS THAN 10 MINUTES.

3.5 FIELD QUALITY CONTROL

PRIOR TO INITIAL OPERATION, INSPECT EQUIPMENT AND PIPING SYSTEMS FOR COMPLIANCE WITH DRAWINGS, SPECIFICATIONS, AND MANUFACTURER'S SUBMITTALS. PERFORM TESTS IN THE PRESENCE OF THE DESIGN TEAM REPRESENATIVE TO DETERMINE CONFORMANCE WITH THE SPECIFIED REQUIREMENTS.

3.5.1 PRELIMINARY TESTS

EACH PIPING SYSTEM SHALL BE HYDROSTATICALLY TESTED AT (1379 KPA) (GAGE) 200 PSIG IN ACCORDANCE WITH NFPA 14 AND NFPA 24 AND SHALL SHOW NO LEAKAGE OR REDUCTION IN GAUGE PRESSURE AFTER 2 HOURS. THE CONTRACTOR SHALL CONDUCT COMPLETE PRELIMINARY TESTS, WHICH SHALL ENCOMPASS ALL ASPECTS OF SYSTEM OPERATION. WHEN TESTS HAVE BEEN COMPLETED AND ALL NECESSARY CORRECTIONS MADE. SUBMIT TO THE OWNER A SIGNED AND DATED CERTIFICATE, SIMILAR TO THAT SPECIFIED IN NFPA 13, ATTESTING TO THE SATISFACTORY COMPLETION OF ALL TESTING AND STATING THAT THE SYSTEM IS IN OPERATING CONDITION. ALSO INCLUDE A WRITTEN REQUEST FOR A FORMAL INSPECTION AND TEST.

3.5.2 FORMAL INSPECTION AND TESTS (ACCEPTANCE TESTS)

THE MONTGOMERY FIRE MARSHAL AND DESIGNATED DESIGN TEAM MEMBER. WILL WITNESS FORMAL TESTS AND APPROVE ALL SYSTEMS BEFORE THEY ARE ACCEPTED. THE SYSTEM SHALL BE CONSIDERED READY FOR SUCH TESTING ONLY AFTER ALL NECESSARY PRELIMINARY TESTS HAVE BEEN MADE AND ALL DEFICIENCIES FOUND HAVE BEEN CORRECTED TO THE SATISFACTION OF THE DESIGN TEAM REPTESENTATIVE AND FIRE MARSHAL AND WRITTEN CERTIFICATION TO THIS EFFECT IS RECEIVED BY THE DIVISION FIRE PROTECTION ENGINEER.

SUBMIT THE REQUEST FOR FORMAL INSPECTION AT LEAST 15 WORKING DAYS PRIOR TO THE DATE THE INSPECTION IS TO TAKE PLACE. EXPERIENCED TECHNICIANS REGULARLY EMPLOYED BY THE CONTRACTOR IN THE INSTALLATION OF BOTH THE MECHANICAL AND ELECTRICAL PORTIONS OF SUCH SYSTEMS SHALL BE PRESENT DURING THE INSPECTION AND SHALL CONDUCT THE TESTING. ALL INSTRUMENTS, PERSONNEL, APPLIANCES, WATER AND EQUIPMENT FOR TESTING SHALL BE FURNISHED BY THE CONTRACTOR. ALL NECESSARY TESTS ENCOMPASSING ALL ASPECTS OF SYSTEM OPERATION SHALL BE MADE INCLUDING THE FOLLOWING, AND ANY DEFICIENCY FOUND SHALL BE CORRECTED AND THE SYSTEM RETESTED AT NO COST TO THE OWNER.

____ Drawn by: CRS____

Designed by: KSW_____

Checked by: CPA

3.5.3 FLOW TEST

PERFORM FLOW TESTS OF EACH STANDPIPE RISER IN ACCORDANCE WITH NFPA 14. AFFIX (0-1379 KPA) 0-200 PSI PRESSURE GAUGES HOSE VALVE. CONNECT LINED, 65 MM 2 1/2 INCH DIAMETER FIRE HOSE WITH UNDERWRITER'S PLAYPIPE TO HOSE VALVE AND FLOW AT LEAST (946 L/M) 250 GPM FOR 5 MINUTES FROM STANDPIPE TO A SAFE LOCATION OUTSIDE THE TUNNEL. FOR DRY PIPE SYSTEM, SUPPLY SYSTEM THROUGH (65 MM) 2 1/2 INCH FIRE HOSE CONNECTED TO THE NEAREST FIRE HYDRANT. FURNISH HOSE, NOZZLES AND FITTINGS REQUIRED FOR THIS TEST.

3.5.4 ADDITIONAL TESTS

WHEN DEFICIENCIES, DEFECTS OR MALFUNCTIONS DEVELOP DURING THE TESTS REQUIRED. ALL FURTHER TESTING OF THE SYSTEM SHALL BE SUSPENDED UNTIL PROPER ADJUSTMENTS, CORRECTIONS OR REVISIONS HAVE BEEN MADE TO ASSURE PROPER PERFORMANCE OF THE SYSTEM. IF THESE REVISIONS REQUIRE MORE THAN A NOMINAL DELAY, THE DESIGN TEAM AND OWNER SHALL BE NOTIFIED WHEN THE ADDITIONAL WORK HAS BEEN COMPLETED, TO ARRANGE A NEW INSPECTION AND TEST OF THE SYSTEM. ALL TESTS REQUIRED SHALL BE REPEATED PRIOR TO FINAL ACCEPTANCE, UNLESS DIRECTED OTHERWISE.

-- END OF SECTION --

MONTGOMERY COUNTY DEPARTMENT OF TRANSPORTATION GAITHERSBURG, MARYLAND RECOMMENDED FOR APPROVAL HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND Chief, Transportation Planning and Design Section Date THAT I AM A DULY LICENSED PROFESSIONAL APPROVED ENGINEER UNDER THE LAWS OF THE STATE hief, Division of Transportation Engineering 8815 Centre Park Drive, Suite 200 Columbia, Maryland 21045

SHEET <u>108</u> of 169

FEBRUARY 2020

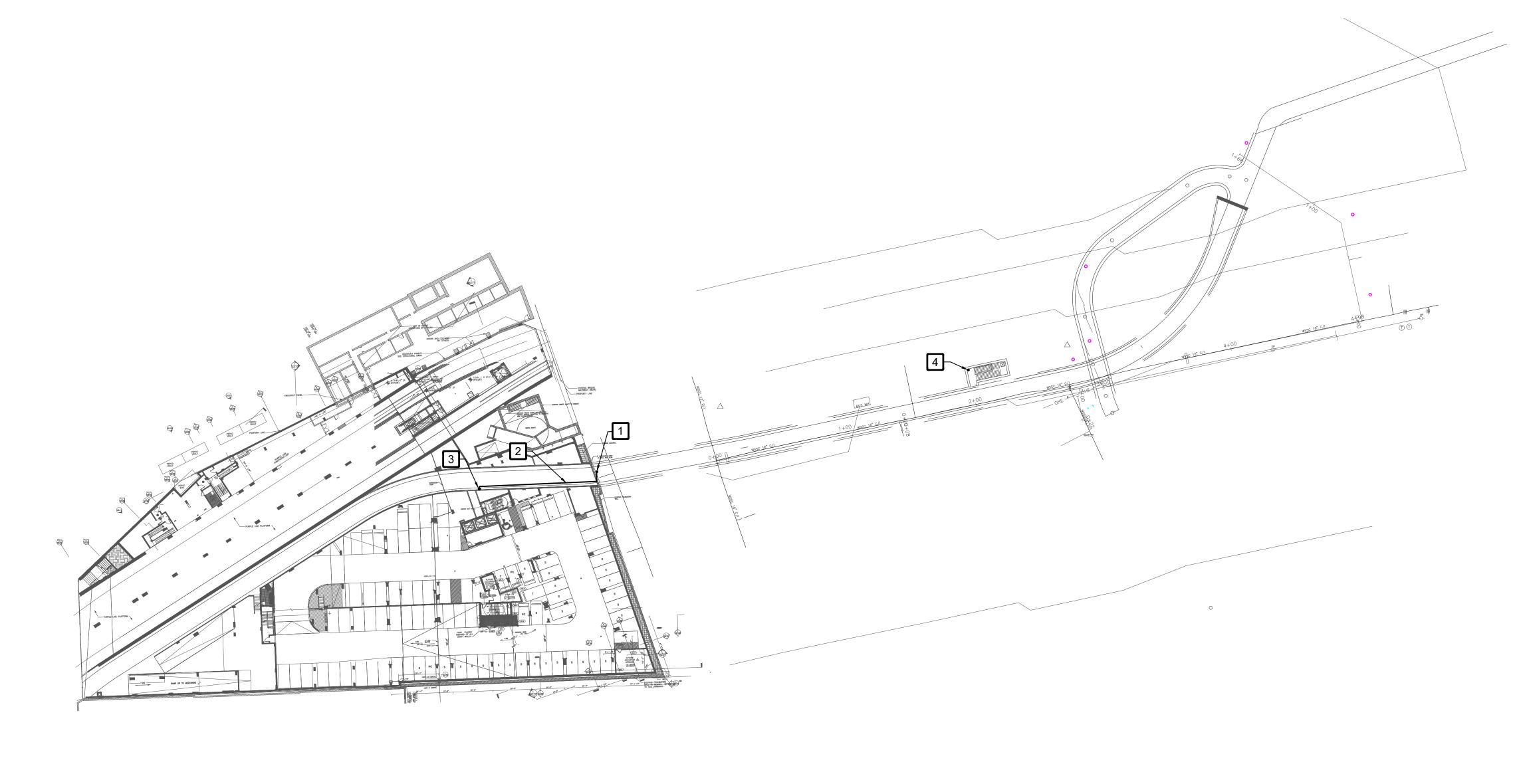
FIRE SUPPRESSION SPECS

CAPITAL CRESCENT TRAIL

UNDER MD 355

BETHESDA, MARYLAND

Project No. : 501316



DRAWING NOTES:

- 1 4" STANDPIPE MAIN UP TO FREE STANDING FIRE DEPARTMENT CONNECTION NOTED ON SHEET FS110.
- 2 RUN 4" STANDPIPE MAIN ABOVE TUNNEL DROP CEILING.
- 3 DROP 4" STANDPIPE MAIN CONCEALED WITHIN TUNNEL WALL DOWN TO HOSE VALVE CABINET. SEE SHEET 111 FOR FURTHER DETAILS.
- 4" STANDPIPE MAIN UP TO FREE STANDING FIRE DEPARTMENT CONNECTION NOTED ON SHEET 110. FIRE DEPARTMENT HOSE CONNECTION PROVIDED AT BOTTOM OF STANDPIPE .



PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL WaltMiller_PEStamp.tif ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO.___ EXPIRATION DATE:__

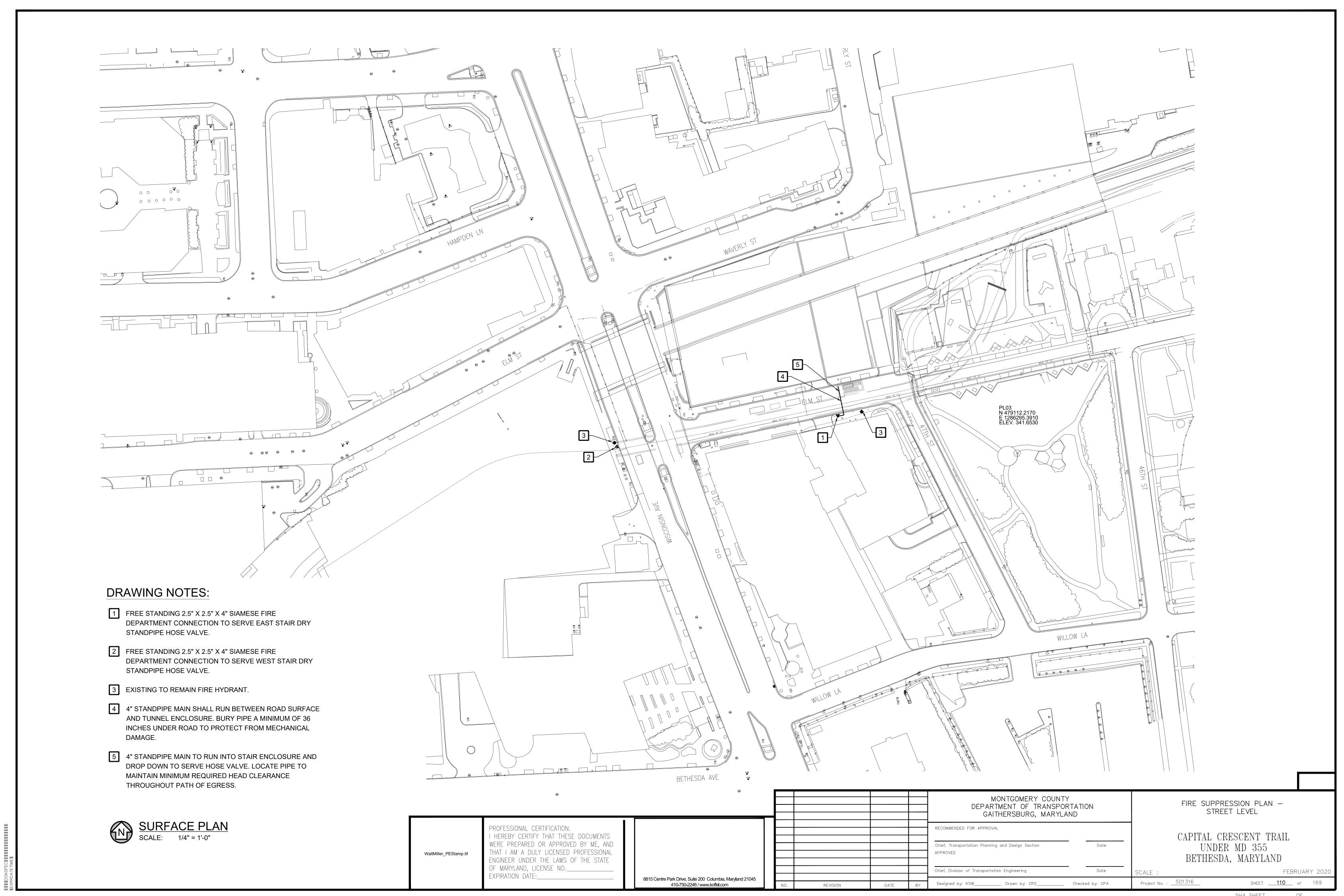
8815 Centre Park Drive, Suite 200 Columbia, Maryland 21045 410-750-2246 / www.koffel.com

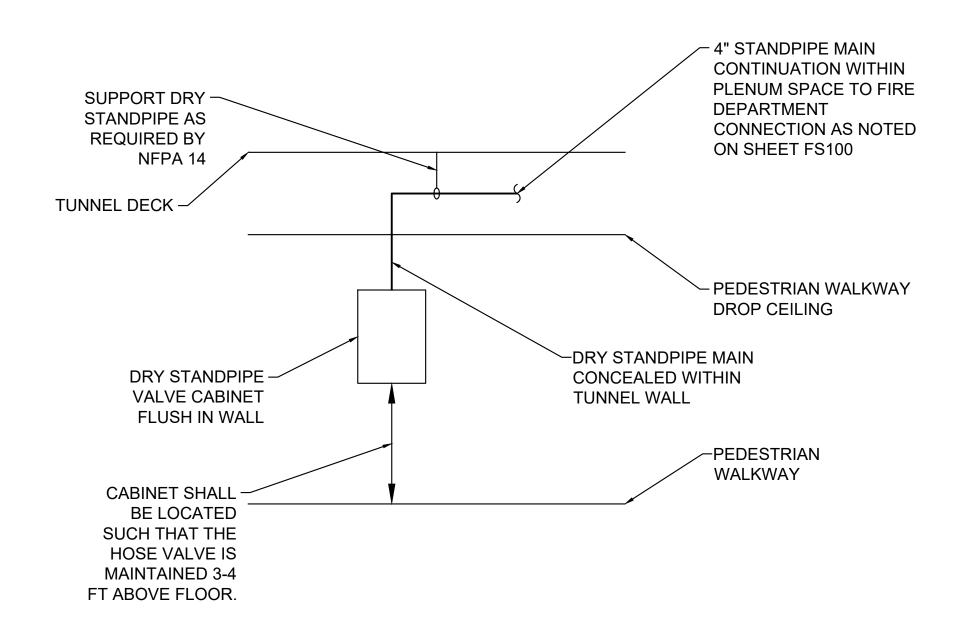
_				MONTGOMERY COUNTY DEPARTMENT OF TRANSPORTATION GAITHERSBURG, MARYLAND		
				RECOMMENDED FOR APPROVAL		
				Chief, Transportation Planning and Design Section APPROVED	Date	
				Chief, Division of Transportation Engineering	Date	SCA
NO.	REVISION	DATE	BY	Designed by: KSW Drawn by: CRS Ch	ecked by: CPA	Pro

FIRE SUPPRESSION PLAN — UNDERGROUND

CAPITAL CRESCENT TRAIL UNDER MD 355 BETHESDA, MARYLAND

FEBRUARY 2020 Project No. : __501316 SHEET <u>109</u> of 169

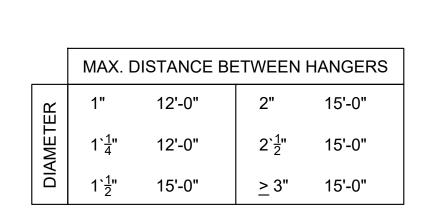


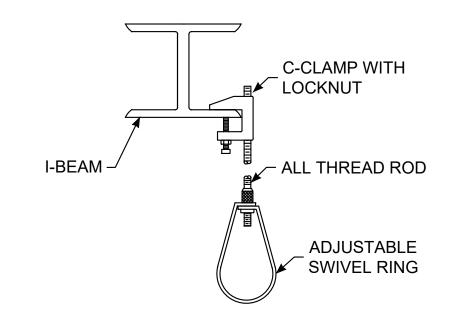


SURFACE PLAN SCALE: NTS

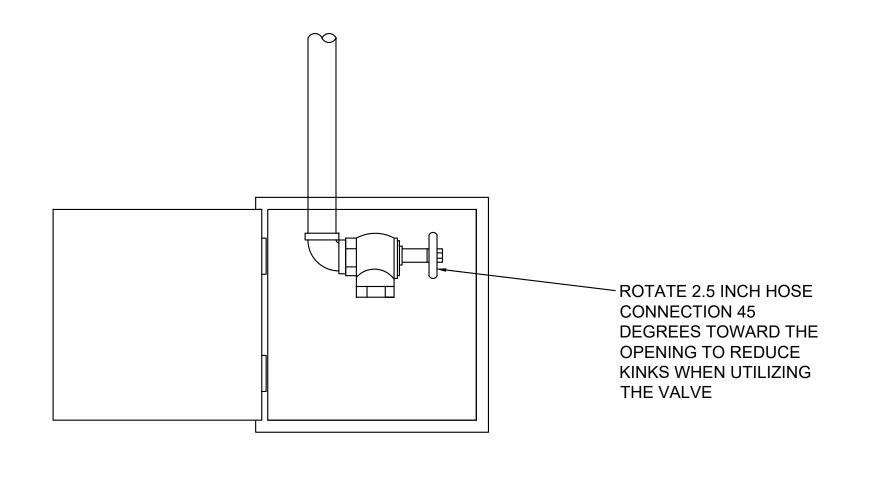
HANGER NOTES:

- 1. WHERE SYSTEM PRESSURES EXCEED 100 PSI, MAXIMUM UNSUPPORTED LENGTH SHALL NOT EXCEED 12".
- 2. MIN $\frac{3}{8}$ " ALL THREAD ROD FOR PIPE DIAMETERS 4" AND SMALLER.
- 3. DO NOT SUPPORT SPRINKLER PIPE FROM BOTTOM CHORDS OF BAR JOIST OR FROM ROOF DECKING.
- 4. WHERE TRAPEZE HANGERS ARE USED, THEY SHALL BE INSTALLED IN ACCORDANCE WITH NFPA 14.



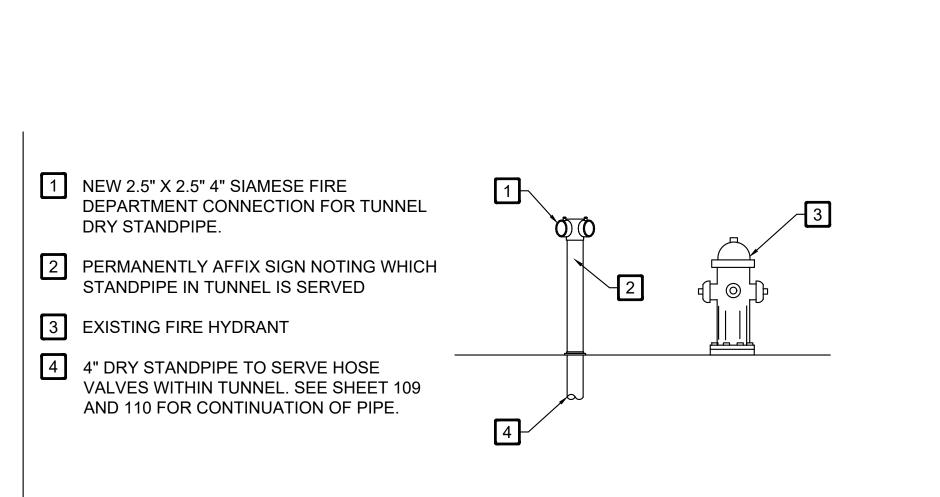


TYPICAL HANGER DETAIL
SCALE: NTS

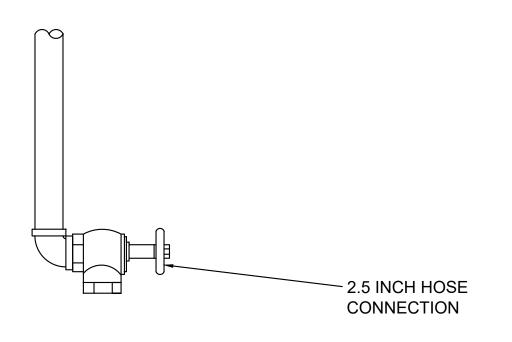


HOSE CABINET INTERIOR DETAIL

SCALE: NTS



FREESTANDING FIRE DEPARTMENT CONNECTION DETAIL SCALE: NTS

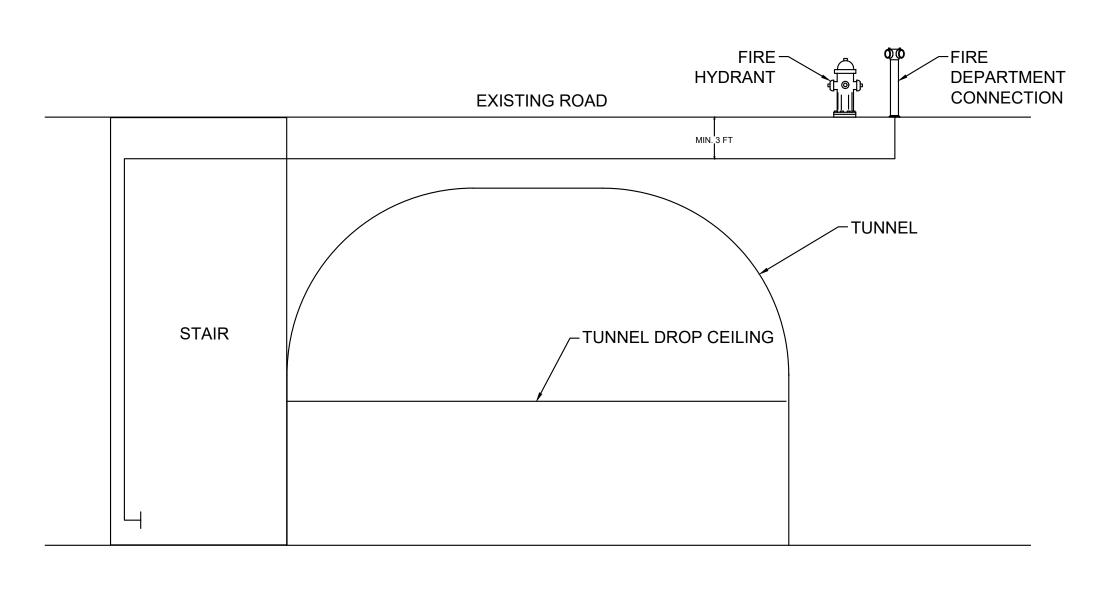


NOTE:

1. LOCATE HOSE VALVE 3-4 FT ABOVE THE FINISHED FLOOR WITHOUT IMPINGING UPON REQUIRED CLEAR EGRESS WIDTH IN THE STAIR.

HOSE CABINET STAIR DETAIL

SCALE: NTS



FIRE HYDRANT LOCATION

SCALE: NTS

							MONTGOMERY COUNTY DEPARTMENT OF TRANSPOR GAITHERSBURG, MARYLA	TATION	FIRE SI
WaltMiller_PEStamp.tif	PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE						RECOMMENDED FOR APPROVAL Chief, Transportation Planning and Design Section APPROVED	Date	CAPITA U BETH
	OF MARYLAND, LICENSE NO EXPIRATION DATE:						Chief, Division of Transportation Engineering	Date	SCALE :
	LATINATION DATE	8815 Centre Park Drive, Suite 200 Columbia, Maryland 21045 410-750-2246 / www.koffel.com	NO.	REVISION	DATE	BY	Designed by: KSW Drawn by: CRS	Checked by: CPA	Project No. : 501316

FEBRUARY 2020

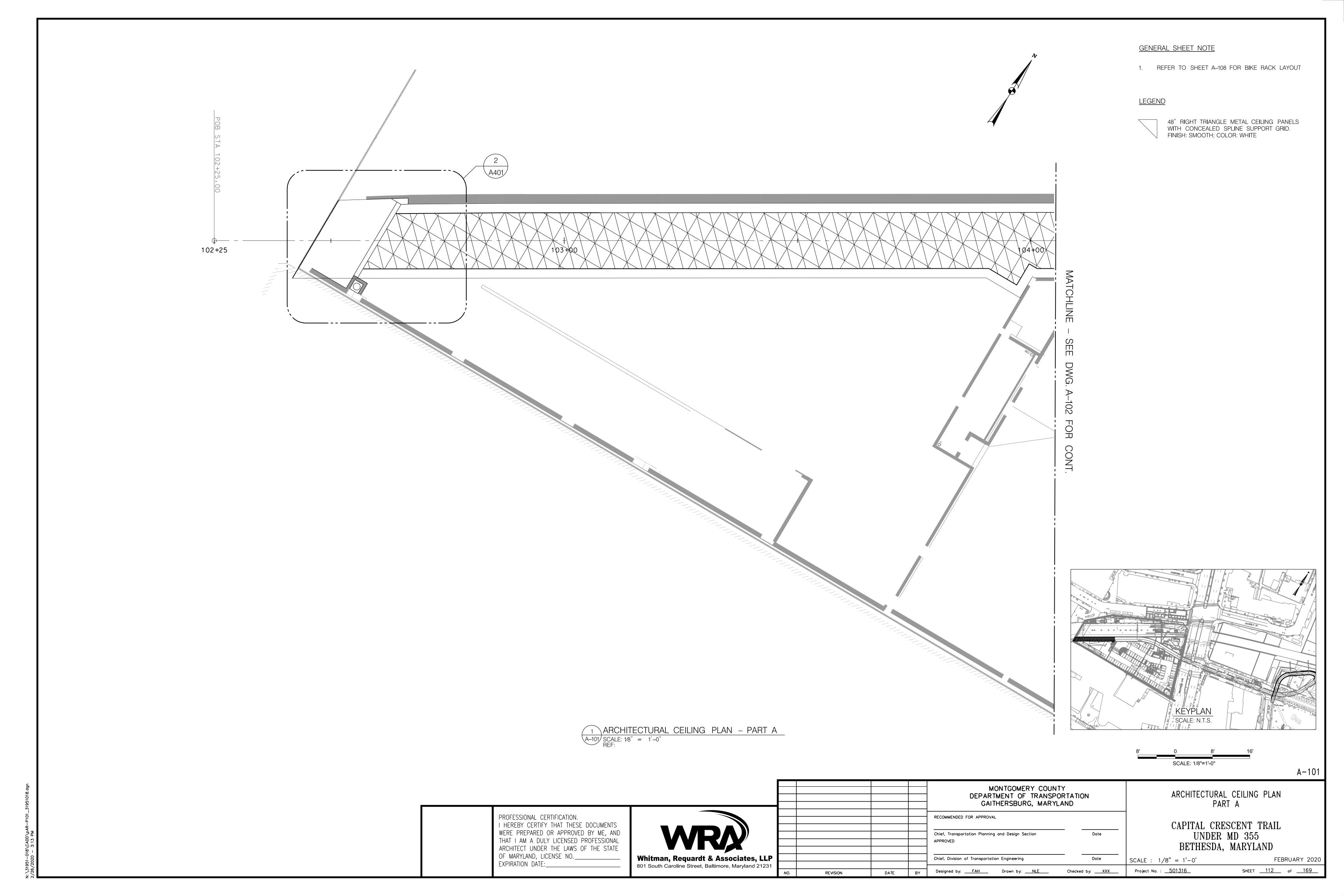
SHEET <u>111</u> of 169

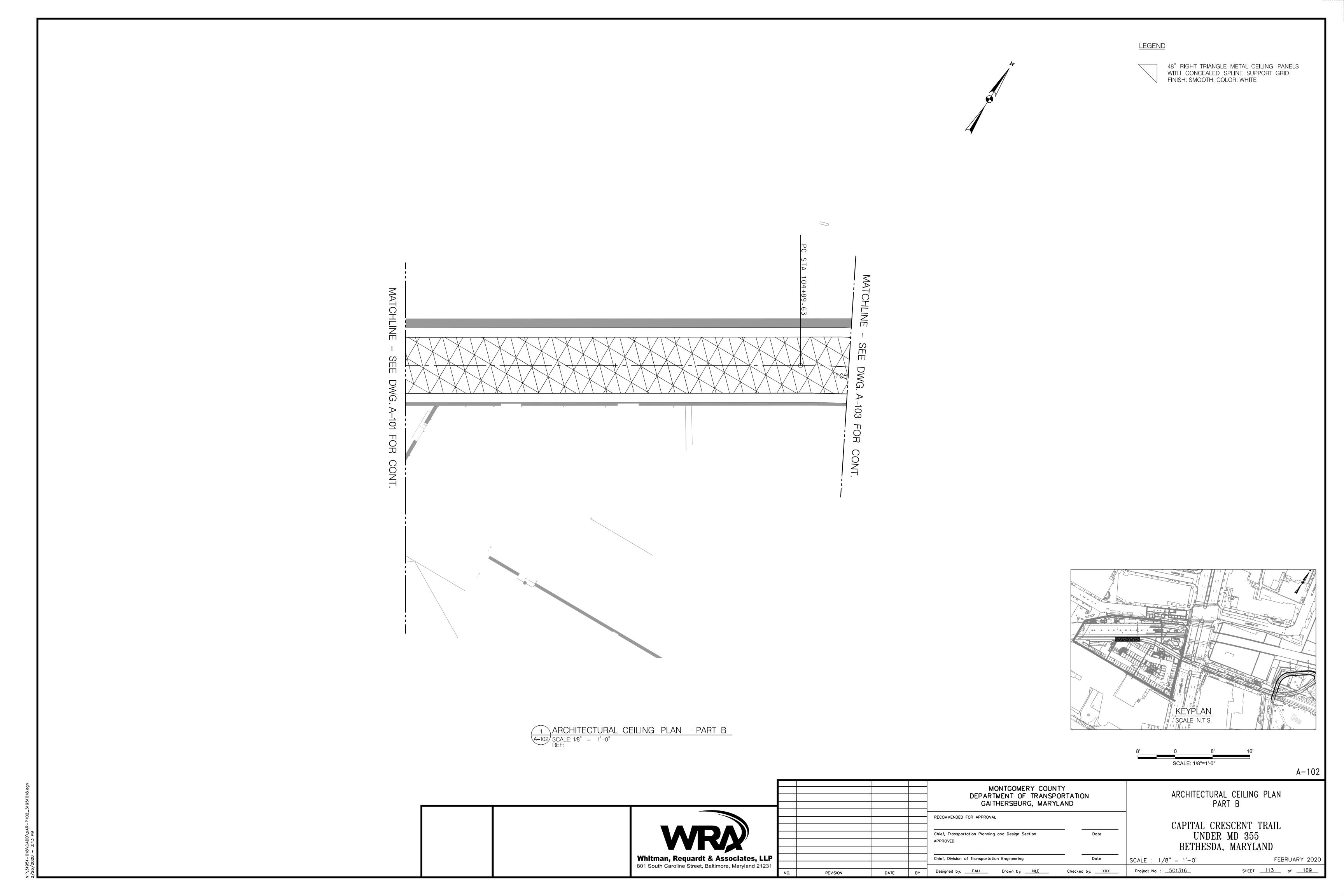
FIRE SUPPRESSION DETAILS

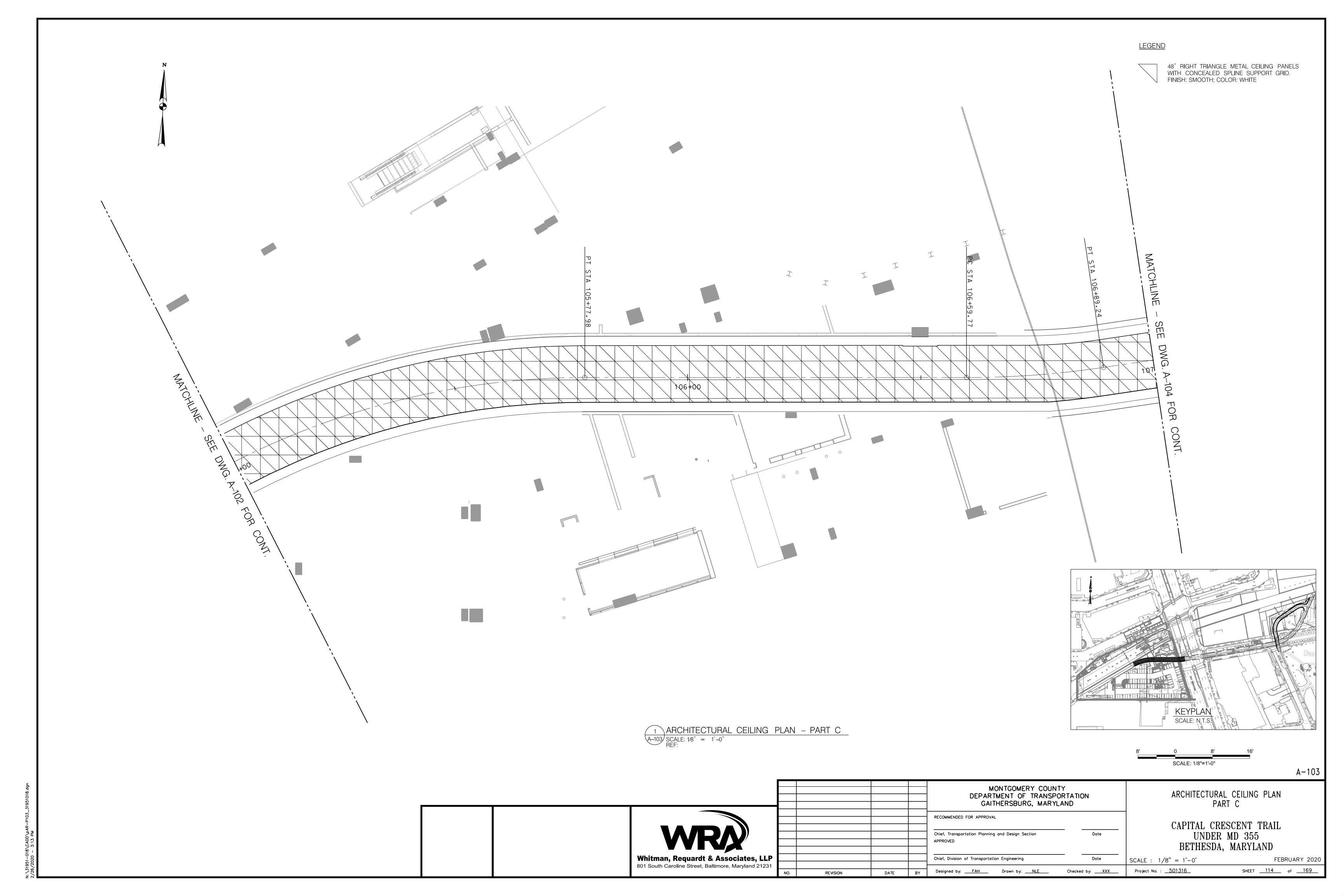
CAPITAL CRESCENT TRAIL

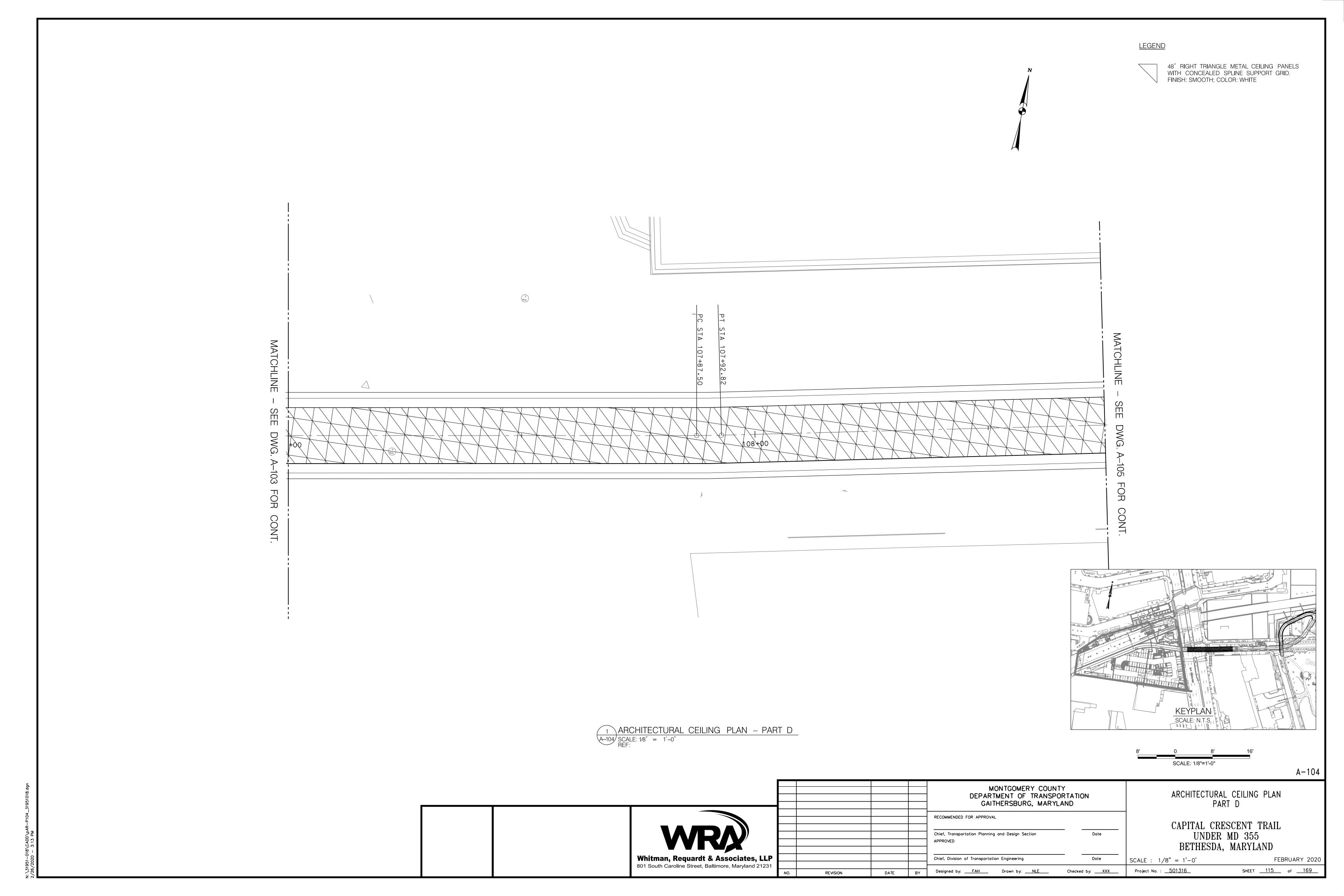
UNDER MD 355

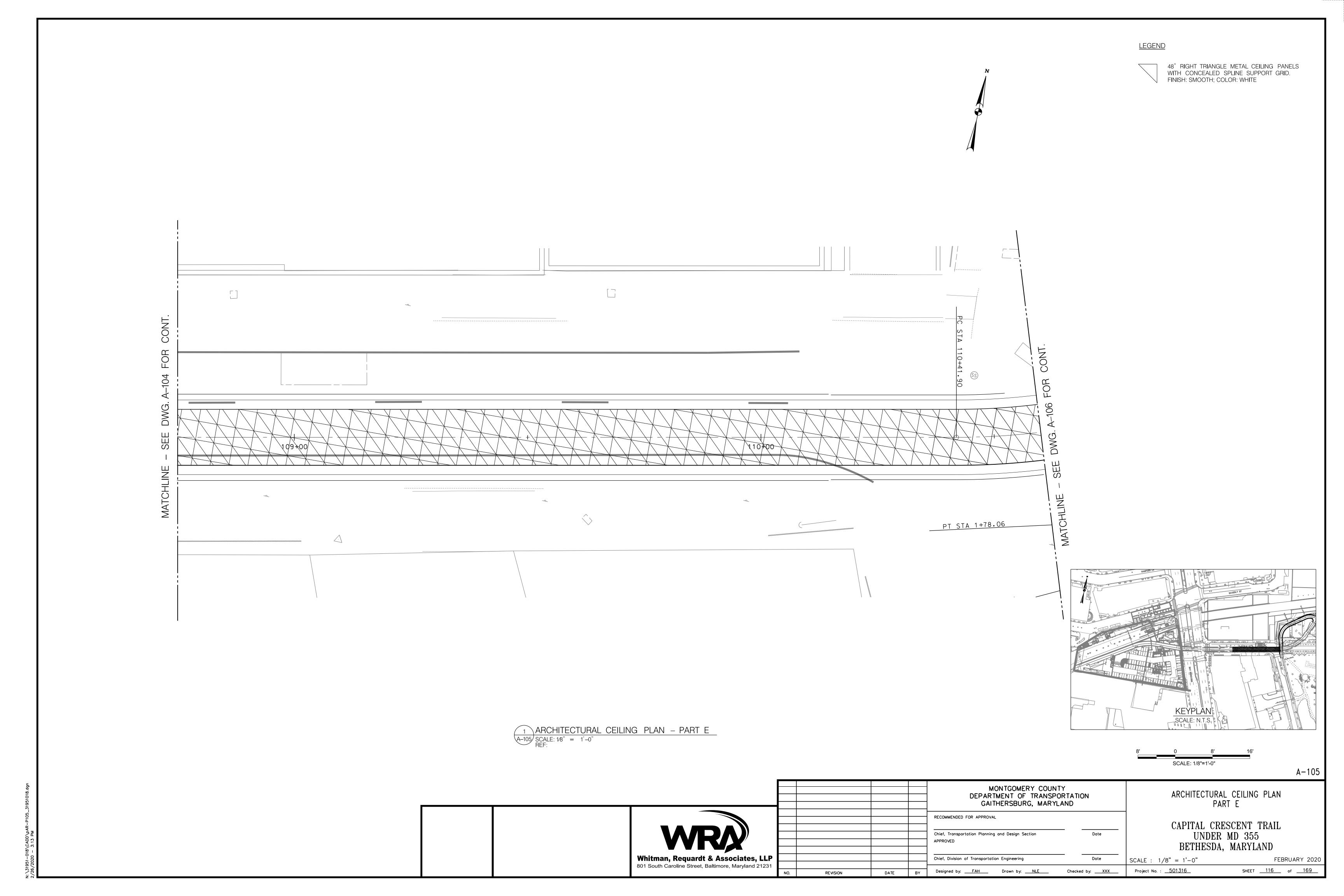
BETHESDA, MARYLAND

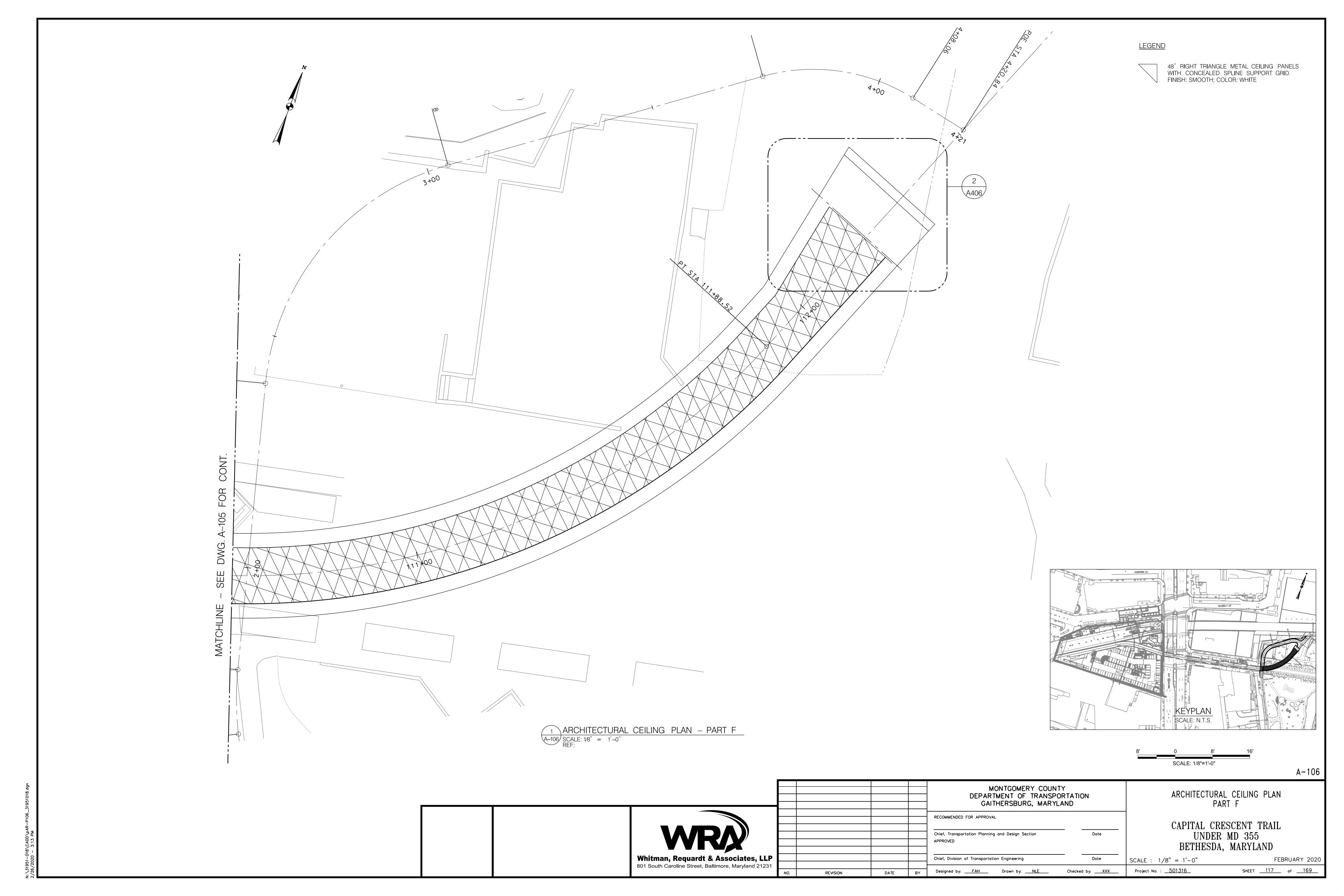








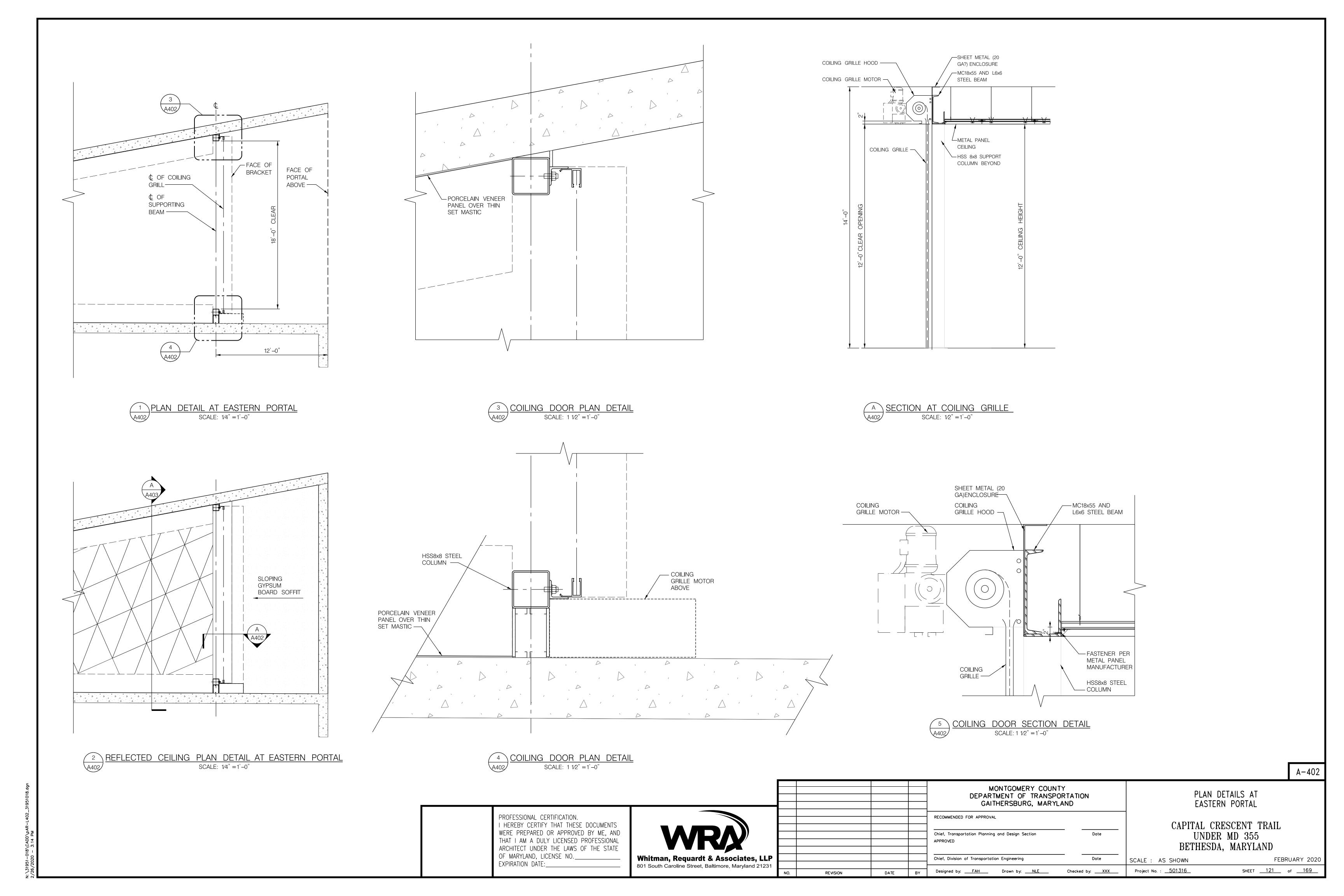


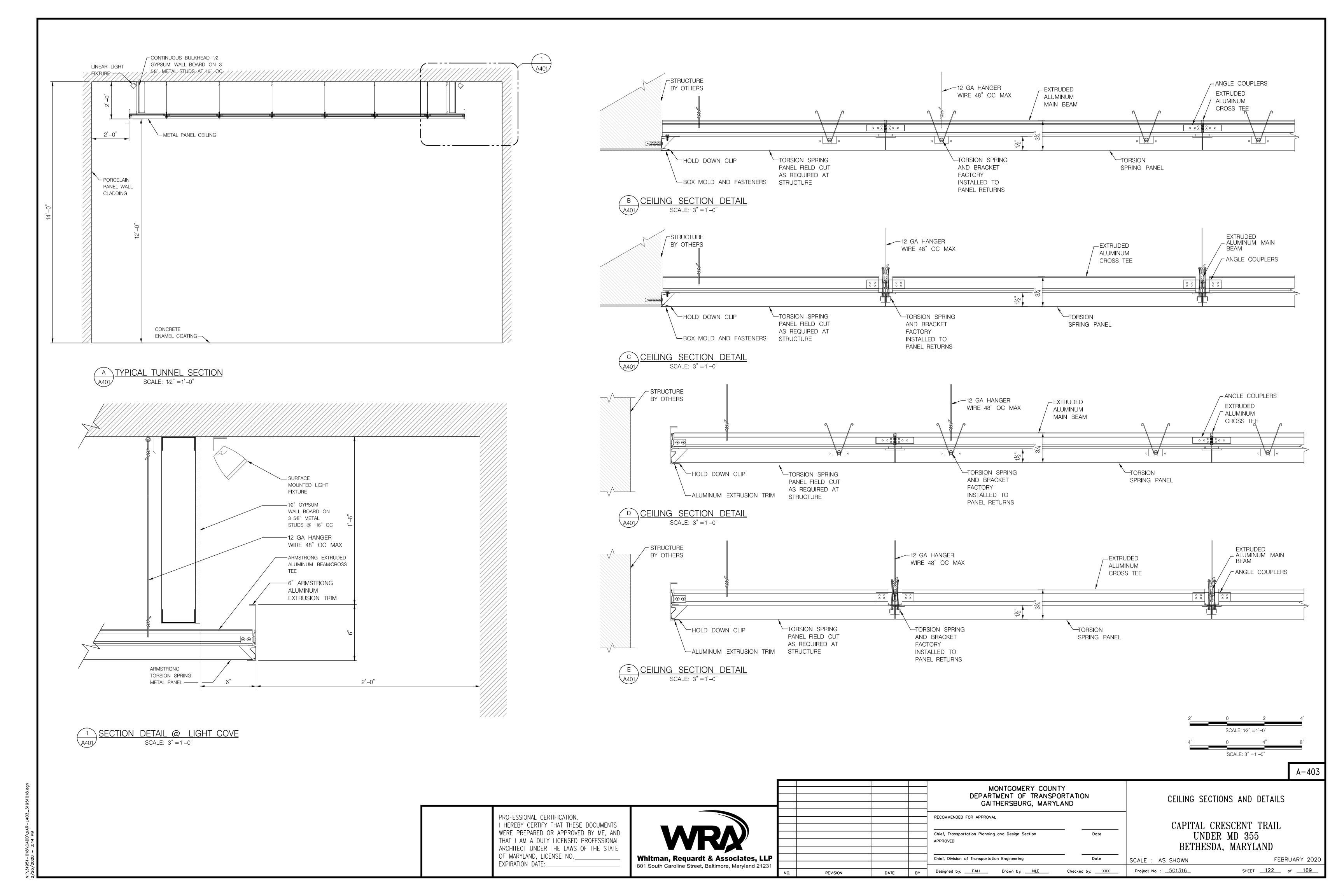


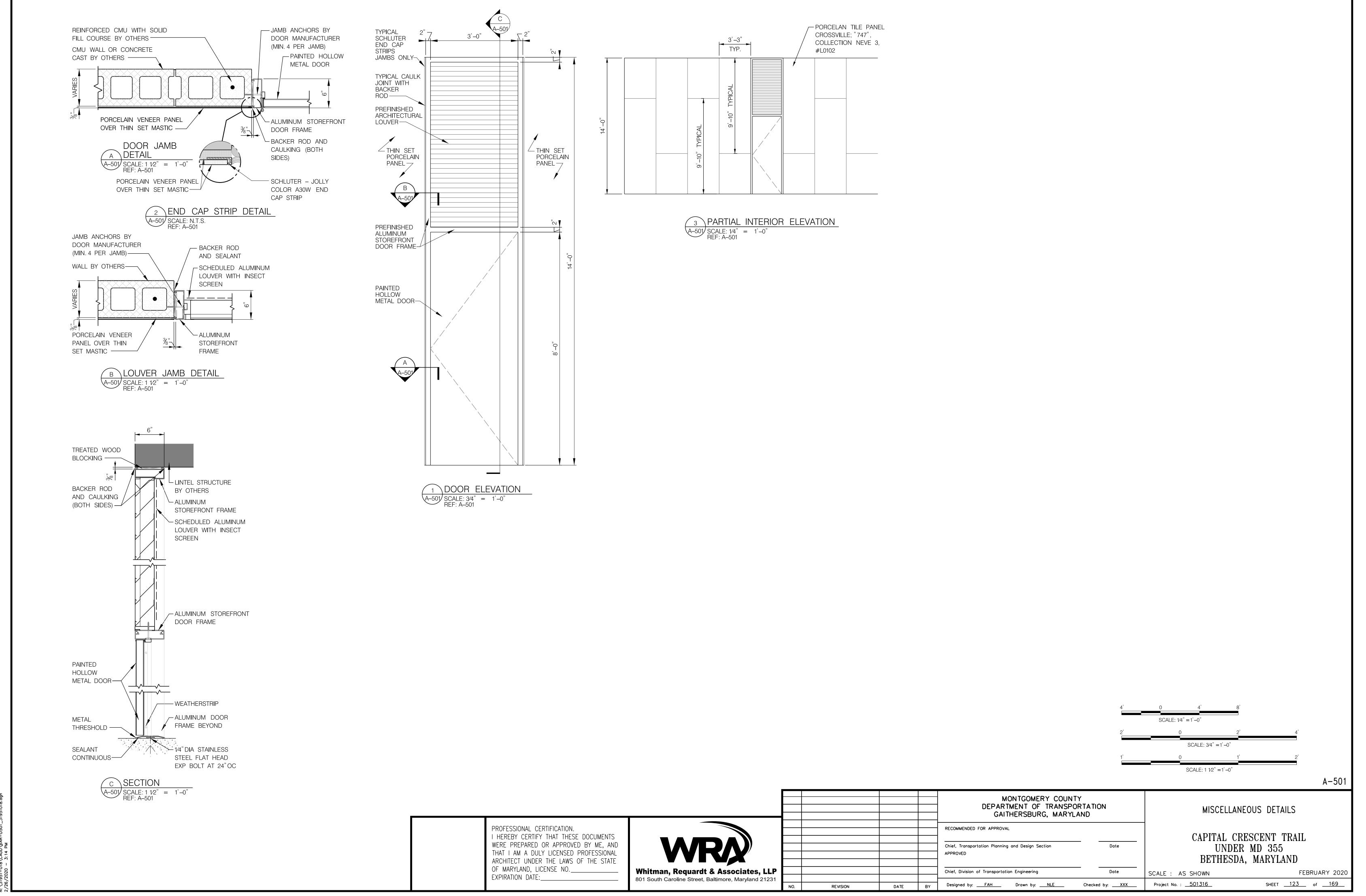
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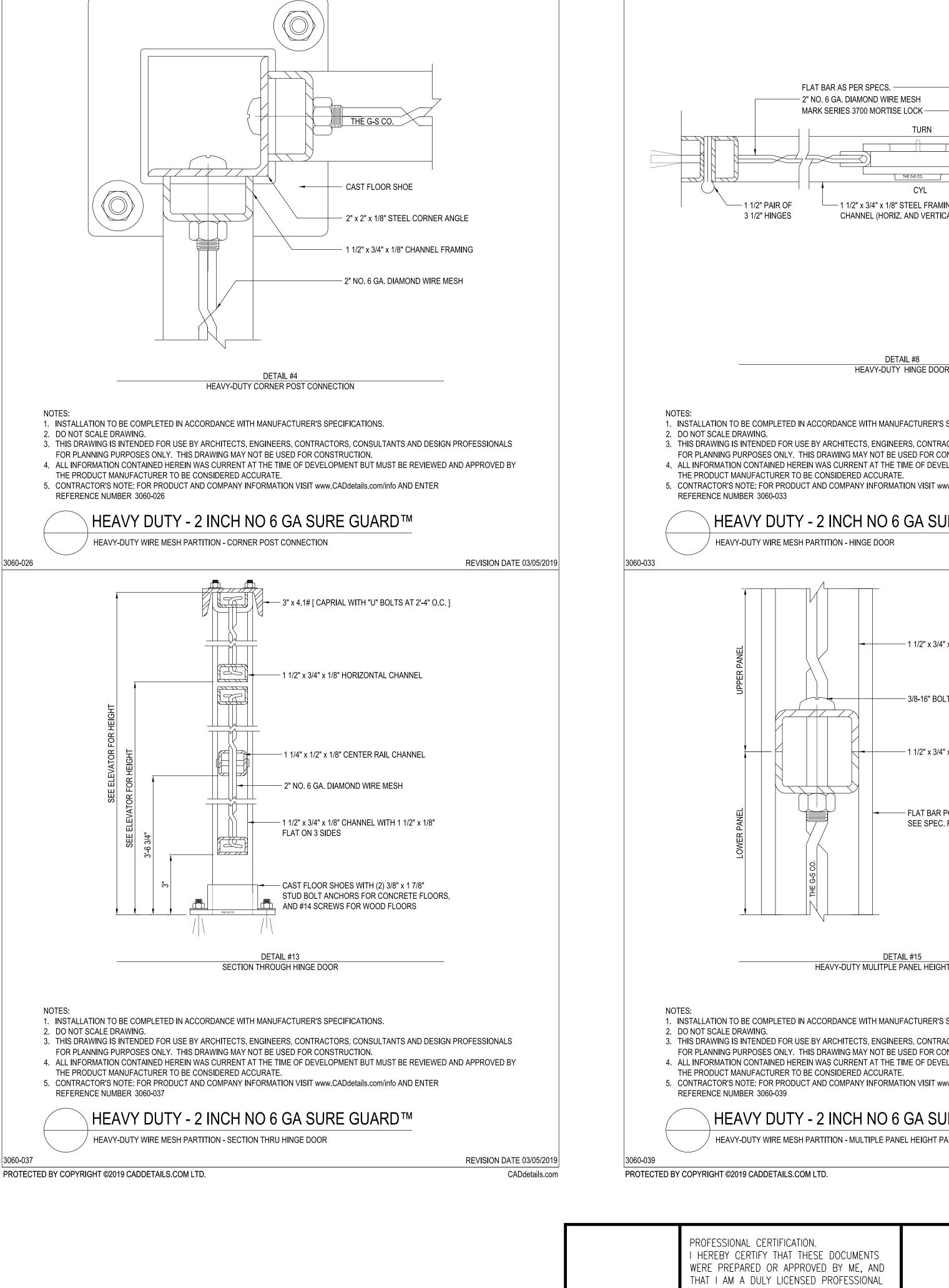
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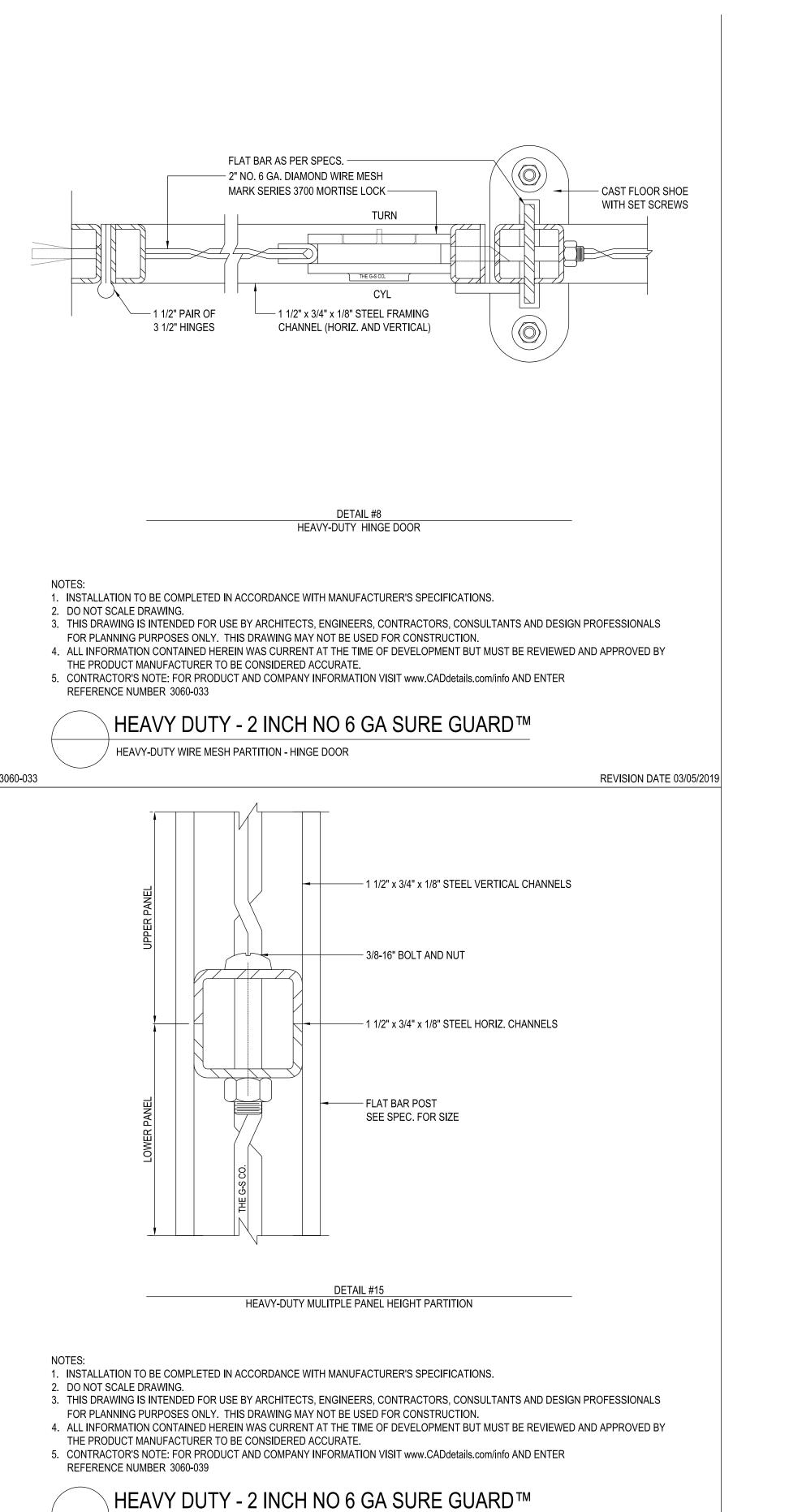
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HEAVY-DUTY WIRE MESH PARTITION - MULTIPLE PANEL HEIGHT PARTITION

REVISION DATE 03/05/2019 CADdetails.com

- 1 1/2" x 3/4" x 1/8" VERTICAL STEEL CHANNELS - 1 1/4" x 1/2" x 1/8" CHANNELS FOR CENTER RAILS (2) REQUIRED – 2" NO. 6 GA. DIAMOND WIRE MESH - FLAT BAR POST (SEE SPECS FOR SIZE) - CAST FLOOR SHOES WITH (2) 3/8" x 1 7/8" STUD BOLTS FOR CONCRETE FLOOR / FOR WOOD FLOOR NO. 14 SCREWS. SECTION THROUGH HEAVY-DUTY HIGH PARTITION 1. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS. 2. DO NOT SCALE DRAWING. 3. THIS DRAWING IS INTENDED FOR USE BY ARCHITECTS, ENGINEERS, CONTRACTORS, CONSULTANTS AND DESIGN PROFESSIONALS FOR PLANNING PURPOSES ONLY. THIS DRAWING MAY NOT BE USED FOR CONSTRUCTION. 4. ALL INFORMATION CONTAINED HEREIN WAS CURRENT AT THE TIME OF DEVELOPMENT BUT MUST BE REVIEWED AND APPROVED BY THE PRODUCT MANUFACTURER TO BE CONSIDERED ACCURATE. 5. CONTRACTOR'S NOTE: FOR PRODUCT AND COMPANY INFORMATION VISIT www.CADdetails.com/info AND ENTER REFERENCE NUMBER 3060-036 HEAVY DUTY - 2 INCH NO 6 GA SURE GUARD™ HEAVY-DUTY WIRE MESH PARTITION - SECTION THRU HEAVY-DUTY HIGH PARTITION 3060-036 REVISION DATE 03/05/2019 - WALL CLIP - ANCHORAGE: 3/8" x 1 7/8" STUD BOLT OR 1/4-20 BOLT AND DOUBLE EXPANSION SHIELDS AT MASONRY WALLS. 1 1/2" x #14 WOOD SCREWS AT WOOD, #14 METAL SCREWS OR 1/4" TOGGLE BOLTS @ DRYWALL & STUD PARTITIONS THE G-S CO. —— @' NO. 6 GA. DIAMOND WIRE MESH - 1 1/2" x 3/4" x 1/8" STEEL CHANNEL FRAMING WALL CLIP CONNECTION NOTES: 1. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS. 2. DO NOT SCALE DRAWING. 3. THIS DRAWING IS INTENDED FOR USE BY ARCHITECTS, ENGINEERS, CONTRACTORS, CONSULTANTS AND DESIGN PROFESSIONALS FOR PLANNING PURPOSES ONLY. THIS DRAWING MAY NOT BE USED FOR CONSTRUCTION. 4. ALL INFORMATION CONTAINED HEREIN WAS CURRENT AT THE TIME OF DEVELOPMENT BUT MUST BE REVIEWED AND APPROVED BY THE PRODUCT MANUFACTURER TO BE CONSIDERED ACCURATE. 5. CONTRACTOR'S NOTE: FOR PRODUCT AND COMPANY INFORMATION VISIT www.CADdetails.com/info AND ENTER REFERENCE NUMBER 3060-040

— 3" x 4.1# [CAPRIAL WITH "U" BOLTS AT 2'-4" O.C.]

HEAVY DUTY - 2 INCH NO 6 GA SURE GUARD™ HEAVY-DUTY WIRE MESH PARTITION - WALL CLIP CONNECTION

Designed by: RJH Drawn by: NLE

REVISION DATE 03/05/2019 PROTECTED BY COPYRIGHT ©2019 CADDETAILS.COM LTD.

MONTGOMERY COUNTY GAITHERSBURG, MARYLAND

DEPARTMENT OF TRANSPORTATION RECOMMENDED FOR APPROVAL Chief, Transportation Planning and Design Section APPROVED Chief, Division of Transportation Engineering

Checked by: XXX

MISCELLANEOUS DETAILS CAPITAL CRESCENT TRAIL UNDER MD 355

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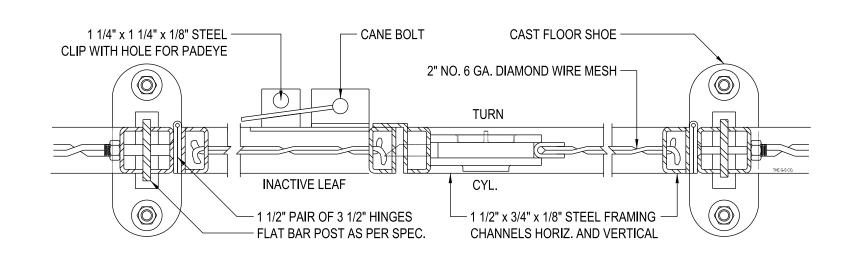
Project No. : <u>501316</u>

A-502

BETHESDA, MARYLAND FEBRUARY 2020 SCALE : AS SHOWN SHEET 124 of XX 169

ARCHITECT UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. EXPIRATION DATE:_

Whitman, Requardt & Associates, LLP 801 South Caroline Street, Baltimore, Maryland 21231

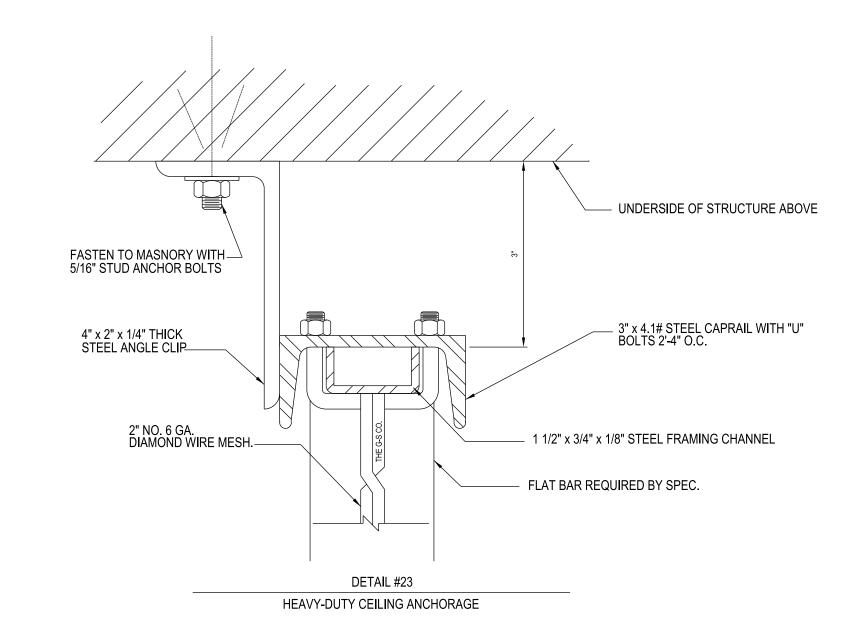


DETAIL #19 HEAVY-DUTY DOUBLE DOOR

1. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.

- 2. DO NOT SCALE DRAWING. 3. THIS DRAWING IS INTENDED FOR USE BY ARCHITECTS, ENGINEERS, CONTRACTORS, CONSULTANTS AND DESIGN PROFESSIONALS
- FOR PLANNING PURPOSES ONLY. THIS DRAWING MAY NOT BE USED FOR CONSTRUCTION. 4. ALL INFORMATION CONTAINED HEREIN WAS CURRENT AT THE TIME OF DEVELOPMENT BUT MUST BE REVIEWED AND APPROVED BY
- THE PRODUCT MANUFACTURER TO BE CONSIDERED ACCURATE.
- 5. CONTRACTOR'S NOTE: FOR PRODUCT AND COMPANY INFORMATION VISIT www.CADdetails.com/info AND ENTER REFERENCE NUMBER 3060-042

\ HEAVY DUTY - 2 INCH NO 6 GA SURE GUARD™ HEAVY-DUTY WIRE MESH PARTITION - DOUBLE DOOR



NOTES:

1. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.

- 2. DO NOT SCALE DRAWING. 3. THIS DRAWING IS INTENDED FOR USE BY ARCHITECTS, ENGINEERS, CONTRACTORS, CONSULTANTS AND DESIGN PROFESSIONALS
- FOR PLANNING PURPOSES ONLY. THIS DRAWING MAY NOT BE USED FOR CONSTRUCTION.
- 4. ALL INFORMATION CONTAINED HEREIN WAS CURRENT AT THE TIME OF DEVELOPMENT BUT MUST BE REVIEWED AND APPROVED BY THE PRODUCT MANUFACTURER TO BE CONSIDERED ACCURATE.
- 5. CONTRACTOR'S NOTE: FOR PRODUCT AND COMPANY INFORMATION VISIT www.CADdetails.com/info AND ENTER REFERENCE NUMBER 3060-045

HEAVY DUTY - 2 INCH NO 6 GA SURE GUARD™

HEAVY-DUTY WIRE MESH PARTITION - CEILING ANCHORAGE

A-503

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ARCHITECT UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO.___ EXPIRATION DATE:_



				MONTGOMERY COUNTY DEPARTMENT OF TRANSPORTATION GAITHERSBURG, MARYLAND					
				GAITTENSBONG, WIARTEAND		4			
				RECOMMENDED FOR APPROVAL					
				Chief, Transportation Planning and Design Section	 Date				
				APPROVED					
				Chief, Division of Transportation Engineering	Date	S			
О.	REVISION	DATE	BY	Designed by: <u>RJH</u> Drawn by: <u>NLE</u> Checke	ed by: XXX				

MISCELLANEOUS DETAILS

CAPITAL CRESCENT TRAIL UNDER MD 355 BETHESDA, MARYLAND

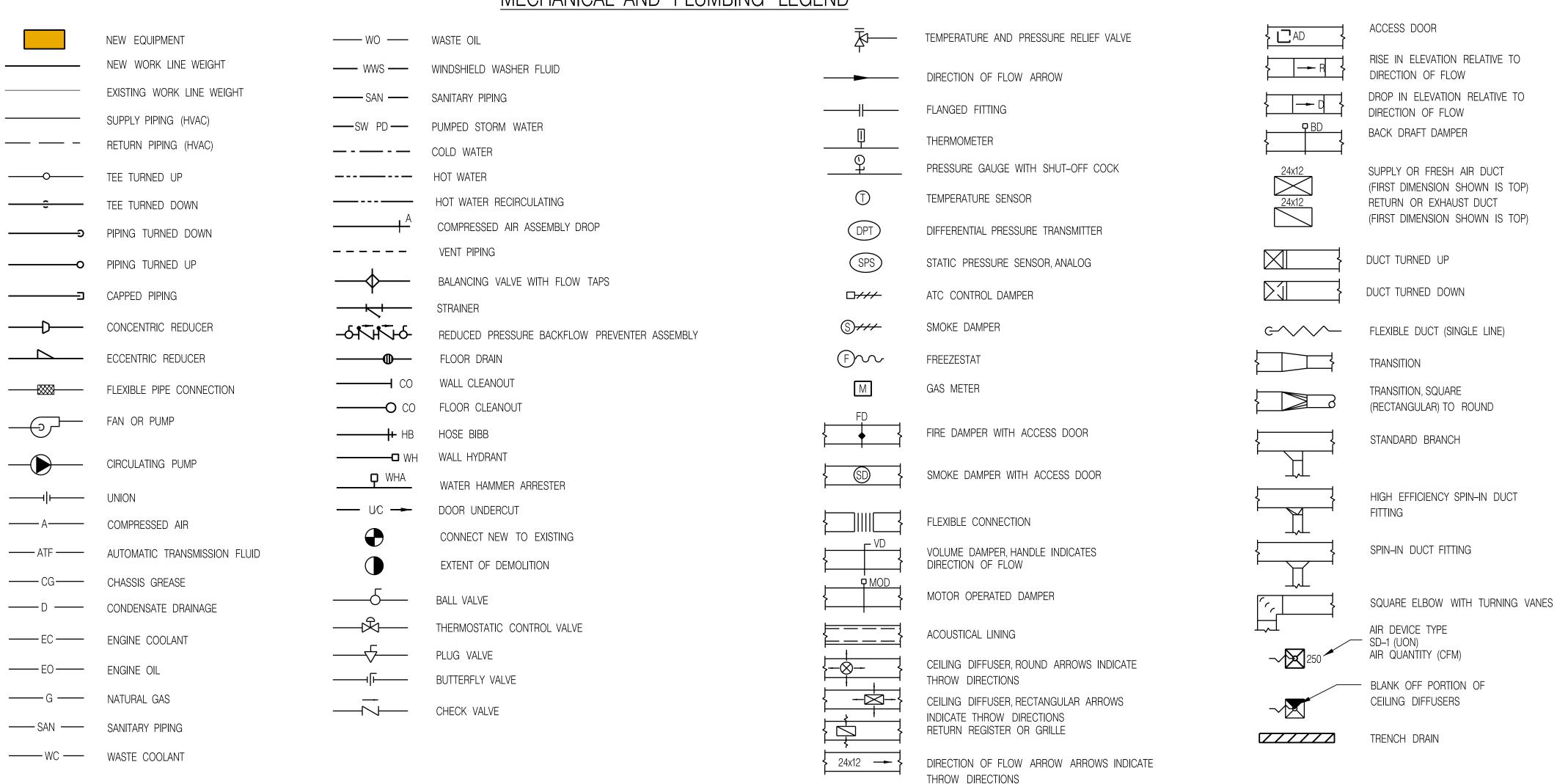
FEBRUARY 2020 SCALE : AS SHOWN SHEET <u>125</u> of XX 169 Project No. : <u>501316</u>

MECHANICAL AND PLUMBING ABBREVIATIONS

@	AT	DCU	DUCTLESS CONDENSING UNIT	FST	LUBRICATION FLUIDS STORAGE TANK	OA	OUTSIDE AIR	TG	TRANSFER GRILLE
&	AND	DDC	DIRECT DIGITAL CONTROLS	FT	FEET	OED	OPEN ENDED DUCT	TEMP	TEMPERATURE
ACCU	AIR COOLED CONDENSING UNIT	DEG F, °F	DEGREE FAHRENHEIT	G	NATURAL GAS	OS&Y	OUTSIDE SCREW & YOKE	TOD	TOP OF DUCT
		DIA	DIAMETER	GAL	GALLONS	OW	OILY WASTE	TP	TRAP PRIMER
AD	ACCESS DOOR, AIR DRYER	DN	DOWN	GPH	GALLONS PER HOUR	Р	PUMP	TSP	TOTAL STATIC PRESSURE
ADJ	ADJUSTABLE	DWG	DRAWING	GPM	GALLONS PER MINUTE	PC	PUMPED CONDENSATE	TYP	TYPICAL
AFF	ABOVE FINISHED FLOOR	DWH	DOMESTIC WATER HEATER	HB	HOSE BIBB	PD	PRESSURE DROP	UH	UNIT HEATER
ATC	AUTOMATIC TEMERATURE CONTROL	DX	DIRECT EXPANSION	HC	HEATING COIL	PH	PHASE	UON	UNLESS OTHERWISE NOTED
APD	AIR PRESSURE DROP	DSS	DUCTLESS SPLIT SYSTEM	HP	HORSEPOWER	PRV	PRESSURE REDUCING VALVE	V	VENT
BDD	BACK DRAFT DAMPER	EAT, LAT	ENTERING/LEAVING AIR TEMPERATURE	HVU	HEATING AND VENTILATING UNIT	PS	PRESSURE SWITCH	VEL	VELOCITY
BOD	BOTTOM OF DUCT	EF	EXHAUST FAN	HW	HOT WATER, POTABLE	PSI	POUNDS PER SQUARE INCH	VTR	VENT THROUGH ROOF
BTUH	BRITISH THERMAL UNIT PER HOUR	EFF	EFFICIENCY	HWR	HOT WATER CIRCULATING, POTABLE	PSIG	POUNDS PER SQUARE INCH (GAGE)	WB	WET BULB
CAP	CAPACITY	EG	EXHAUST GRILLE	HZ	HERTZ	RA	RETURN AIR	W.C.	WATER COLUMN
CAV	CONSTANT AIR VOLUME	EL	ELEVATION	IN	INCH	RF	RETURN AIR FAN	WG	WATER GAUGE
CD	CONDENSATE DRAIN	ESP, TSP	EXTERNAL/TOTAL STATIC PRESSURE	INV	INVERT	RL	REFRIGERANT LIQUID	WH	WALL HYDRANT
CFH	CUBIC FEET PER HOUR	EWT, LWT	ENTERING/LEAVING WATER TEMPERATURE	KW	KILOWATT	RPM	REVOLUTIONS PER MINUTE	WPD	WATER PRESSURE DROP
CFM	CUBIC FEET PER MINUTE	EX, EXIST	EXISTING	MAX	MAXIMUM	RS	REFRIGERANT SUCTION	LBS/HR	POUNDS PER HOUR
CLG	CEILING	EXH	EXHAUST	MBH	1,000 BRITISH THERMAL UNITS (BTU) PER HOUR	SA	SUPPLY AIR		
CO	CLEANOUT	FCU	FAN COIL UNIT	MIN	MINIMUM	SD	SUPPLY AIR DIFFUSER		
CUH	CABINET UNIT HEATER	FD	FLOOR DRAIN, FOUNDATION DRAIN	MOD	MOTOR OPERATED DAMPER	SF	SUPPLY AIR FAN		
CW	COLD WATER, POTABLE	FLA	FULL LOAD AMPERES	N	NORTH	SENS	SENSIBLE COOLING		
D	DAMPER, DEPTH	FM	FACTORY MUTUAL	NC	NOISE CRITERIA, NORMALLY CLOSED	S/M	SHEET METAL		
DB	DRY BULB	FP	LUBRICATION FLUIDS PUMP	NIC	NOT IN CONTRACT	SP	STATIC PRESSURE, SUMP PUMP		
dB	DECIBLES	FPM	FEET PER MINUTE	NO	NORMALLY OPEN	SW	STORM WATER		
		FS	FLOW SWITCH	No	NUMBER	TD	TRENCH DRAIN		

NOT TO SCALE

MECHANICAL AND PLUMBING LEGEND



GENERAL NOTES:

- 1. GENERAL NOTES ARE DISCIPLINE SPECIFIC, AND APPLY TO EVERY DRAWING IN THAT DISCIPLINE. DRAWING NOTES APPLY TO ALL WORK SHOWN ON A DRAWING. CONTRACTOR/DEMOLITION NOTES APPLY TO INDIVIDUAL SITUATIONS AND EQUIPMENT.
- 2. SLOPES AND INVERT ELEVATIONS SHALL BE ESTABLISHED BEFORE ANY PIPING IS INSTALLED IN ORDER TO MAINTAIN PROPER SLOPES.
- 3. MAKE PROPER CONNECTION TO FIXTURES AND EQUIPMENT. DRAWINGS ARE SCHEMATIC AND ALL BRANCH MAINS, ELBOWS, AND CONNECTIONS ARE NOT
- 4. COORDINATE LOCATION OF PIPING AND DUCTWORK WITH LIGHTING FIXTURES, OTHER PIPING AND DUCTWORK, EQUIPMENT AND BUILDING STRUCTURE, PIPING AND DUCTWORK SHALL BE RUN TO AVOID CONFLICTS WITH OTHER TRADES.
- 5. DO NOT RUN PIPING OR LOCATE MECHANICAL EQUIPMENT DIRECTLY ABOVE ELECTRICAL SUBSTATIONS, CABLE TRAYS, TRANSFORMERS, PANEL BOARDS, OR SWITCHGEAR.
- 6. DIMENSIONS ARE IN INCHES UNLESS NOTED OTHERWISE.
- 7. UNLESS NOTED OTHERWISE, PIPING AND DUCTWORK IS OVERHEAD, TIGHT TO UNDERSIDE OF STRUCTURE, WITH SPACE FOR INSULATION IF REQUIRED.
- 8. INSTALL PIPING AND DUCTWORK SO THAT VALVES AND DAMPERS ARE ACCESSIBLE.
- 9. CERTAIN ITEMS SUCH AS ACCESS DOORS. RISE AND DROPS IN DUCTWORK AND PIPING, ETC., ARE INDICATED ON THE DRAWINGS FOR CLARITY OR A SPECIFIC LOCATION REQUIREMENT AND SHALL NOT BE INTERPRETED AS THE EXTENT OF THE REQUIREMENTS FOR THESE ITEMS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THESE ITEMS AS REQUIRED IN THE CONTRACT DRAWINGS AND SPECIFICATIONS.
- 10. SCHEMATIC AND RISER DIAGRAMS INDICATE FLOW AND OPERATIONAL CONCEPT AS WELL AS GENERAL ARRANGEMENT OF EQUIPMENT. VALVES, PRESSURE GAUGES, ETC. ADDITIONAL VALVES PRESSURE GAUGES, ETC. SHALL BE PROVIDED AS SHOWN ON DETAILS AND AS INDICATED IN SPECIFICATIONS.
- 11. DETAILS WITHOUT SPECIFIC REFERENCE TO A LOCATION SHALL BE APPLIED TO THE GENERAL INSTALLATION OF PIPES, DUCTS, ETC.
- 12. DIMENSIONS GIVEN FOR SOUND LINED DUCTWORK ARE INTERNAL CLEAR DIMENSIONS.
- 13. MOUNT TEMPERATURE AND HUMIDITY SENSORS 48" AFF UNLESS NOTED OTHERWISE.
- 14. ESTABLISH SLOPES AND INVERT ELEVATIONS BEFORE ANY PIPE IS INTALLED IN ORDER TO MAINTAIN PROPER SLOPES.
- 15. MAKE PROPER CONNECTIONS TO FIXTURES AND EQUIPMENT. DRAWINGS ARE SCHEMATICS AND ALL BRANCH MAINS, ELBOWS, FITTING, AND CONNECTIONS ARE NOT SHOWN.

M - 001

PROFESSIONAL CERTIFICATION. HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. XX EXPIRATION DATE: XX



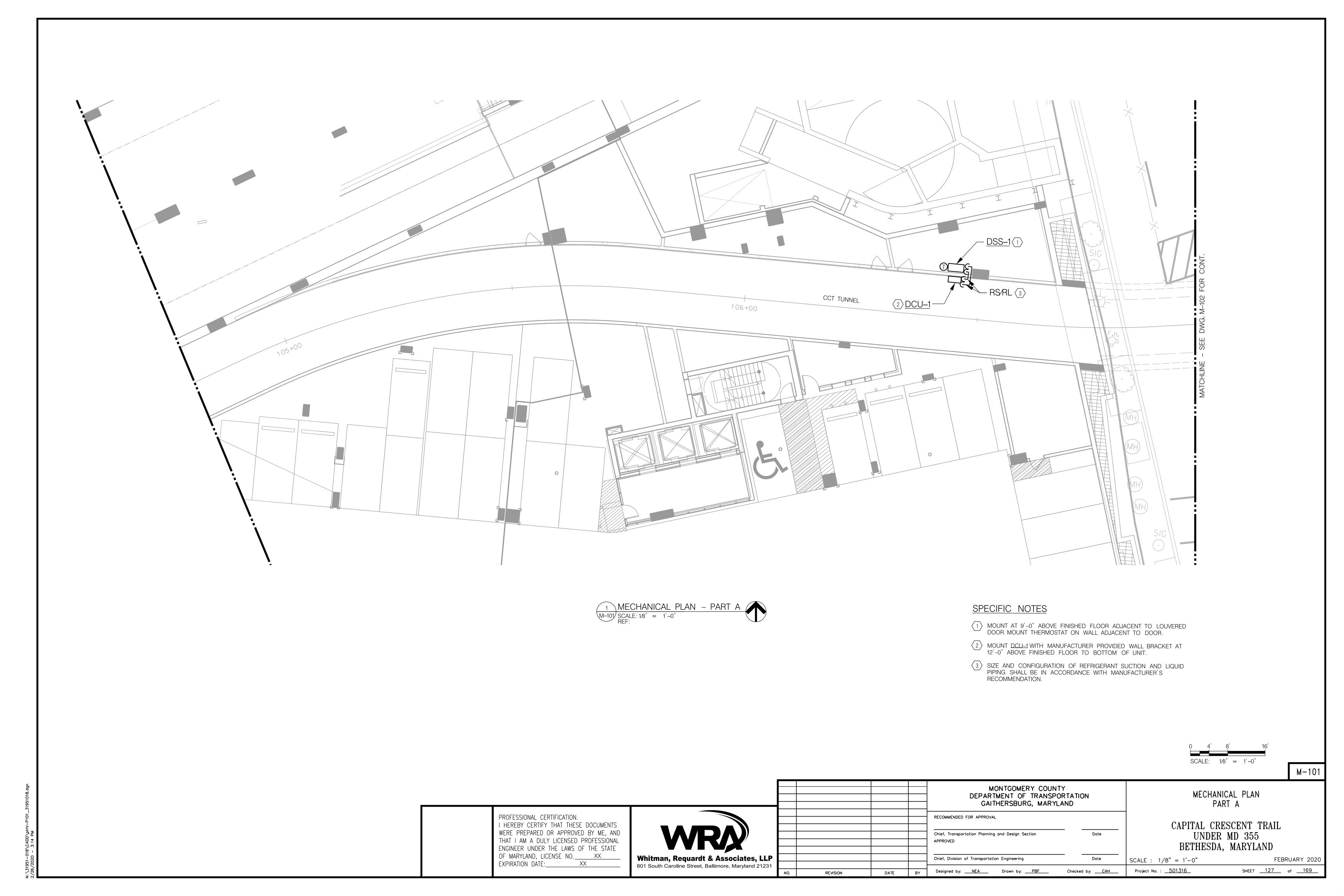
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				Chief, Transportation Planning and Design Section APPROVED	Date	BEI
				Chief, Division of Transportation Engineering	Date	SCALE : NOT TO SCA
NO.	REVISION	DATE	BY	Designed by: <u>NEA</u> Drawn by: <u>PBF</u>	Checked by: <u>CAH</u>	Project No. : <u>501316</u>

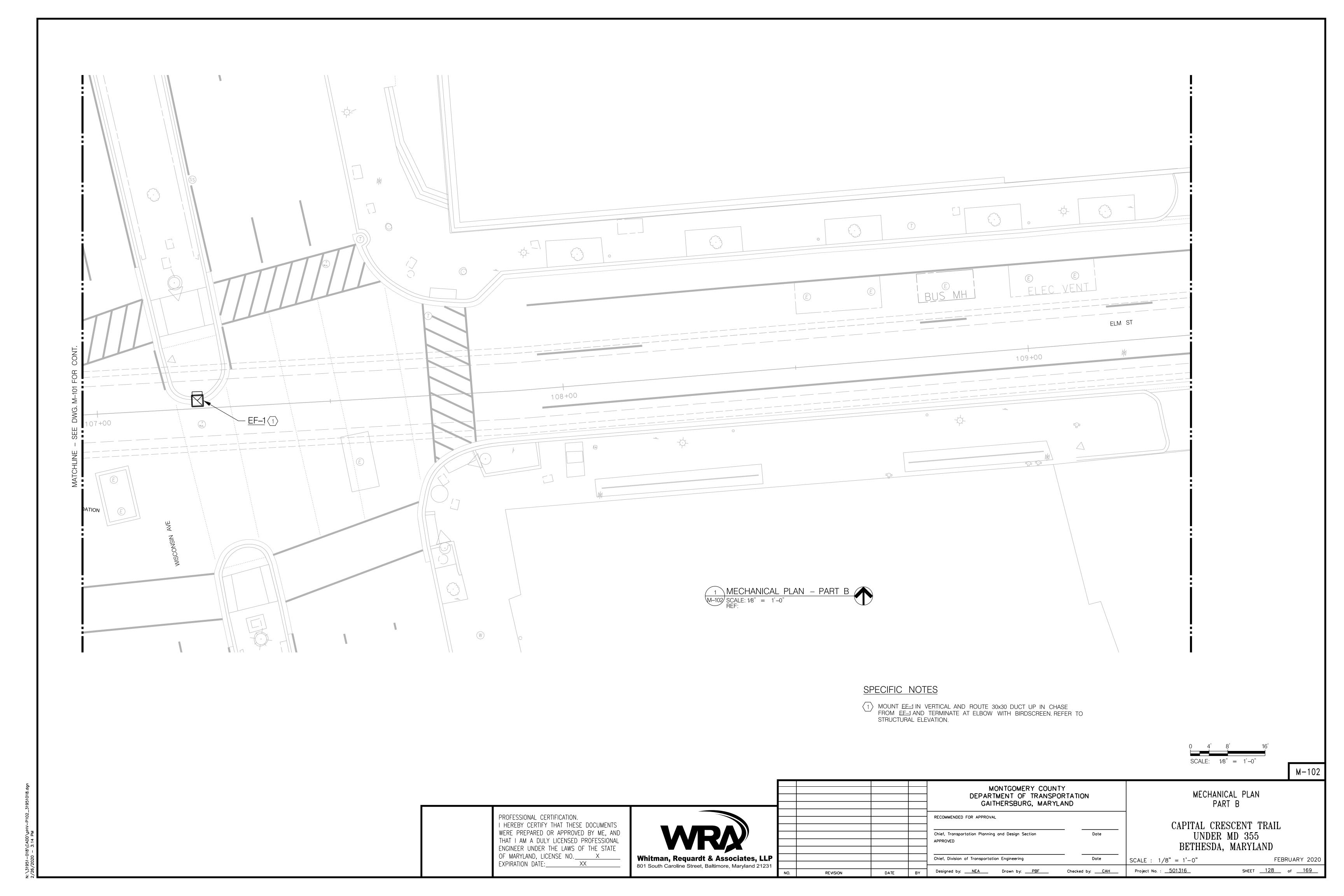
MECHANICAL LEGENDS, ABBREVIATIONS AND NOTES

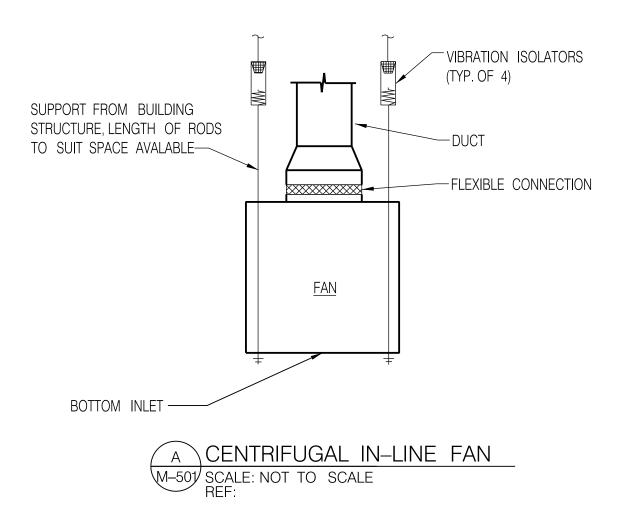
CAPITAL CRESCENT TRAIL UNDER MD 355 BETHESDA, MARYLAND

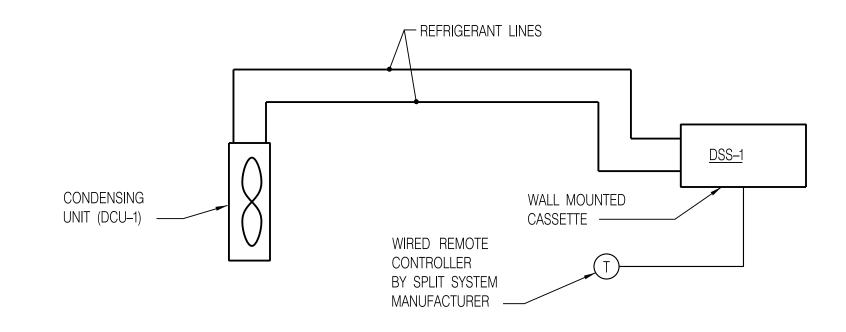
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FEBRUARY 2020 SHEET <u>126</u> of <u>169</u>









B IT ROOM DUCTLESS SPLIT SYSTEM CONTROLS SCHEMATIC
M-501 SCALE: NOT TO SCALE
REF:

CONTROL SEQUENCE - DUCTLESS SPLIT SYSTEM DCU-1/DSS-1

GENERAL:

- 1. SPLIT SYSTEM SHALL OPERATE CONTINUOUSLY UNDER PACKAGED CONTROLS TO MAINTAIN SPACE
- 2. INITIAL SPACE TEMPERATURE SETPOINT SHALL BE 75°F (ADJUSTABLE).

OCCUPIED MODE

- 1. ENERGIZE SUPPLY FAN AND RUN CONTINUOUSLY.
- 2. STAGE COMPRESSORS AND CONDENSER FANS UNDER PACKAGED UNIT CONTROLS AS REQUIRED TO MAINTAIN SPACE TEMPERATURE SETPOINT.

	ELECTRICAL ROOM HEAT PUMP SCHEDULE																
	NOMINAL CAPACITY MINIMUM COMPRESSOR DATA CONDENSER DATA ELECTRICAL DATA (INDOOR UNIT) ELECTRICAL DATA (OUTDOOR UNIT) EQUIPMENT WEIGHT																
UNIT ID	OUTDOOR UNIT	LOCATION	AT 95 F AMBIENT	OPERATING	REFRIG.	QUANTITY	QUANTITY OF FANS	MCA	MOCP	VOLTS/PH	MCA	MOCP	VOLTS/PH	INDOOR/ OUTDOOR	SEER	BASIS OF DESIGN	NOTES
			(TONS)	TEMPERATURE	INLI NO.	QUANTITI	QUANTITI OF LANG	(AMPS)	(AMPS)	VOL13/111	(AMPS)	(AMPS)	VOLIGITI	(LBS)			
DSS-1	DCU-1	UPS ROOM	2	0	410A	1	1	1	15	208/1	16.5	25	208/1	31/172	17.6	MITSUBISHI FAQ & RZQ	

1. PROVIDE UNIT WITH LOW AMBIENT COOLING DOWN TO 0 DEGREES F.

	FAN SCHEDULE													
UNIT ID	TYPE	SERVICE	LOCATION	CFM	ESP (IN. WG)	FAN RPM	DRIVE TYPE	METHOD OF CONTROL	ELECTI HP	RICAL DATA VOLTS/PH	BASIS OF DESIGN	NOTES		
EF-1	INLINE	EXHAUST	TUNNEL	6,000	0.5	1560	BELT	CONTINUOUS	3	460/3	GREENHECK BSQ-180			

Chief, Division of Transportation Engineering

Designed by: <u>NEA</u> Drawn by: <u>PBF</u>

MONTGOMERY COUNTY
DEPARTMENT OF TRANSPORTATION
GAITHERSBURG, MARYLAND

RECOMMENDED FOR APPROVAL

Chief, Transportation Planning and Design Section
APPROVED

MECHANICAL SCHEDULES AND SCHEDULES

CAPITAL CRESCENT TRAIL UNDER MD 355 BETHESDA, MARYLAND

SCALE : NOT TO SCALE

Project No. : <u>501316</u>

Checked by: <u>CAH</u>

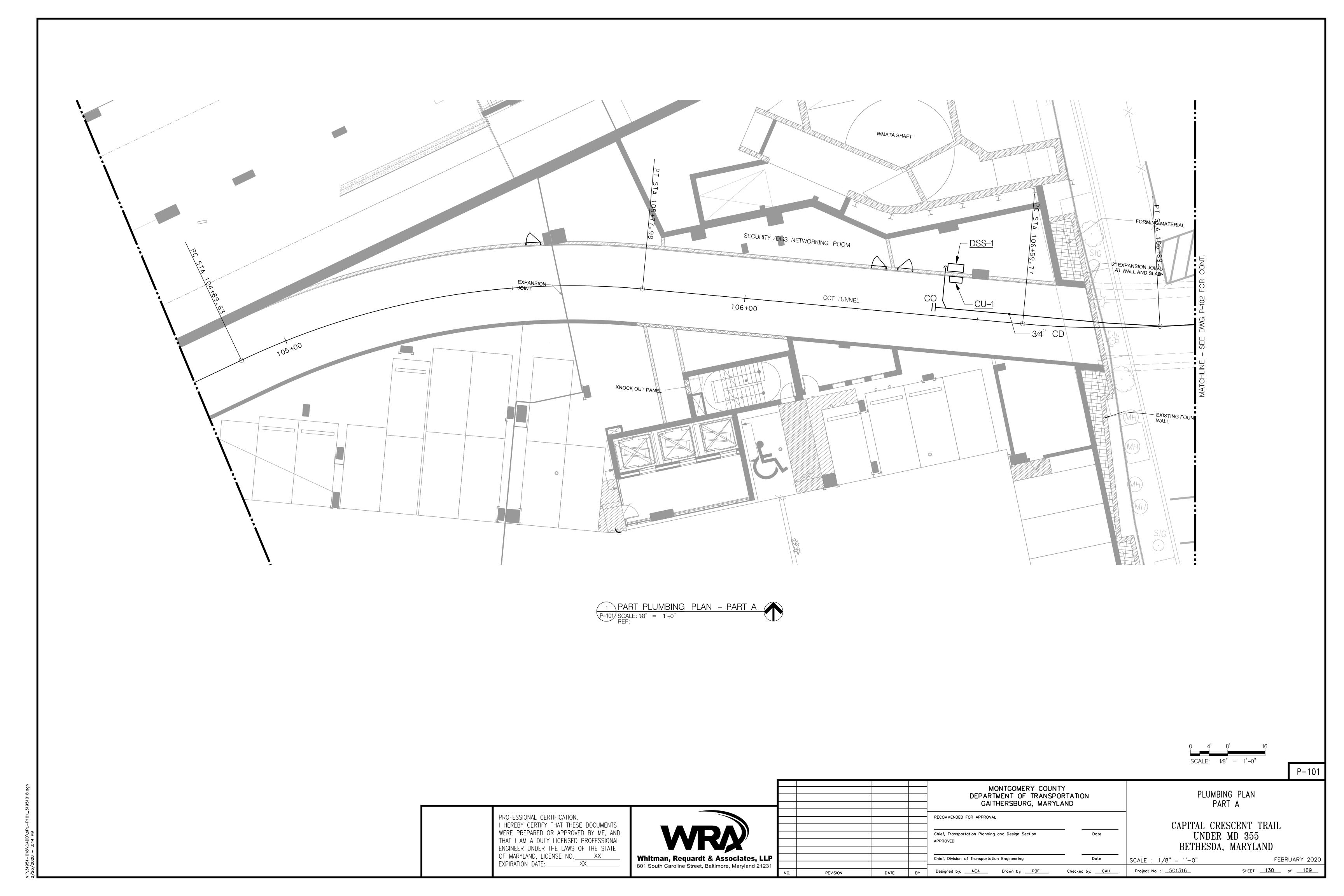
FEBRUARY 2020
SHEET 129 of 169

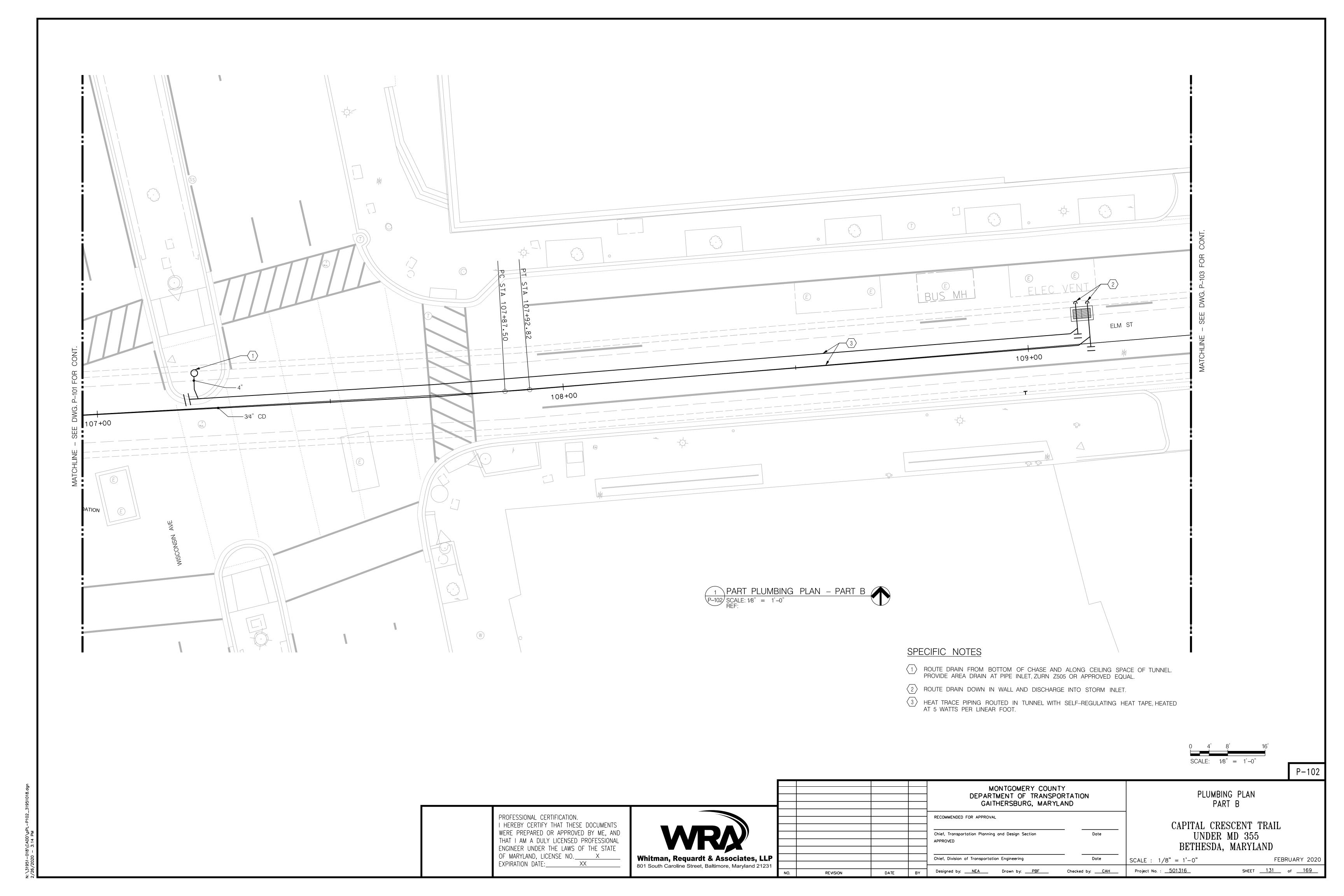
M-501

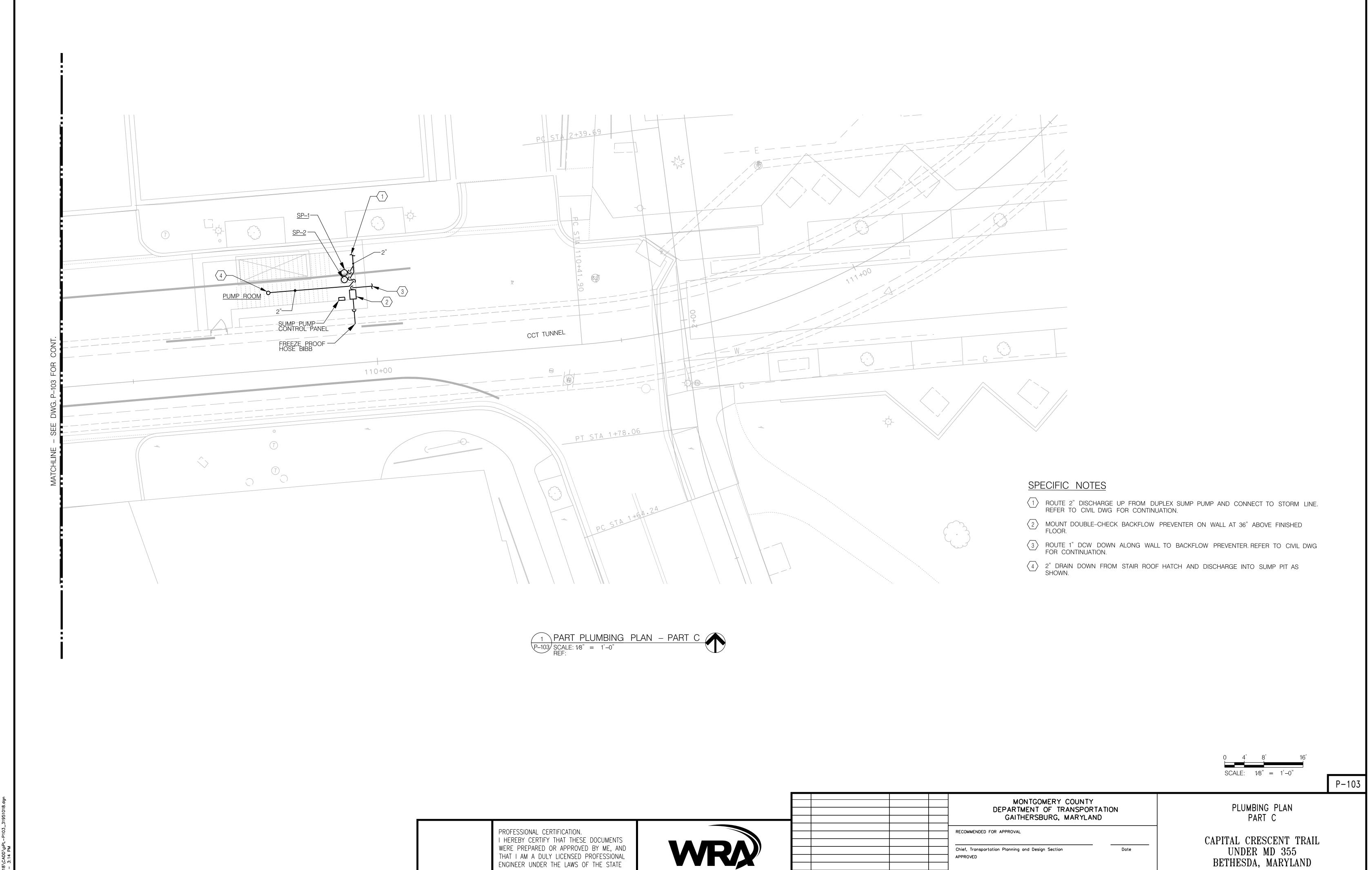
PROFESSIONAL CERTIFICATION.

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THAT I AM A DULY LICENSED PROFESSIONAL
ENGINEER UNDER THE LAWS OF THE STATE
OF MARYLAND, LICENSE NO. _____XX
EXPIRATION DATE: _____XX

Whitman, Requardt & Associates, LLP 801 South Caroline Street, Baltimore, Maryland 21231







Whitman, Requardt & Associates, LLP 801 South Caroline Street, Baltimore, Maryland 21231

Chief, Division of Transportation Engineering

Designed by: <u>NEA</u> Drown by: <u>PBF</u>

SCALE : 1/8" = 1'-0"

Project No. : <u>501316</u>

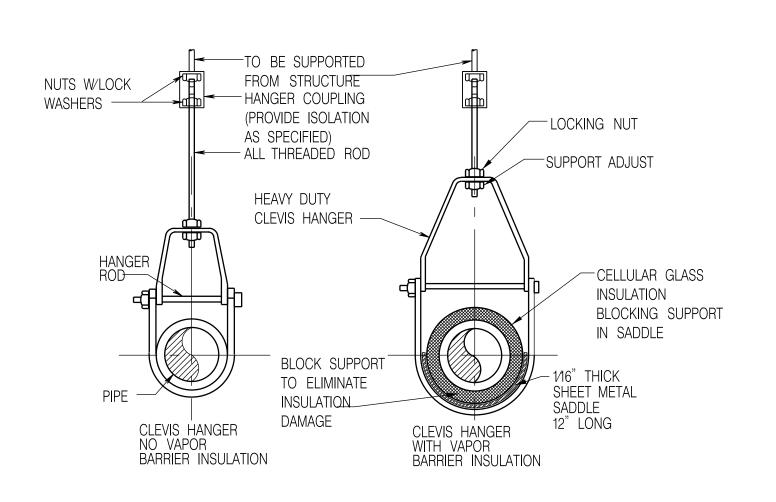
Checked by: <u>CAH</u>

FEBRUARY 2020

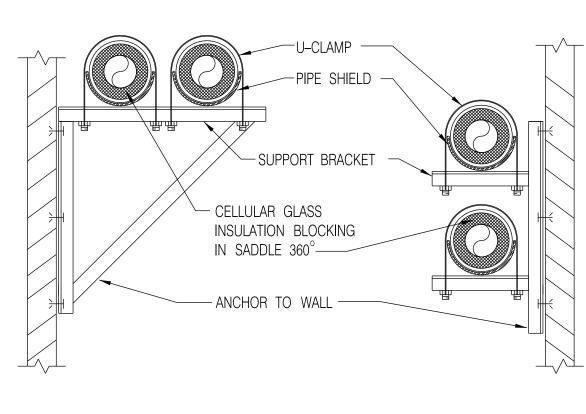
SHEET <u>132</u> of <u>169</u>

OF MARYLAND, LICENSE NO. X

EXPIRATION DATE: XX



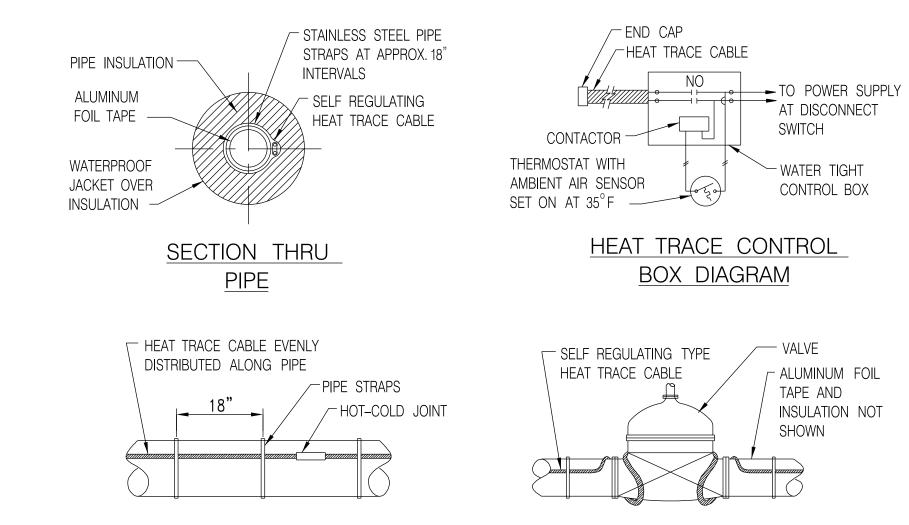
A TYPICAL PIPE HANGER SUPPORTS
P-501 SCALE: NOT TO SCALE
REF:



ON BRACKET RACKED ON WALL

B PIPE SUPPORT – DETAIL
P-501 SCALE: NOT TO SCALE
REF:

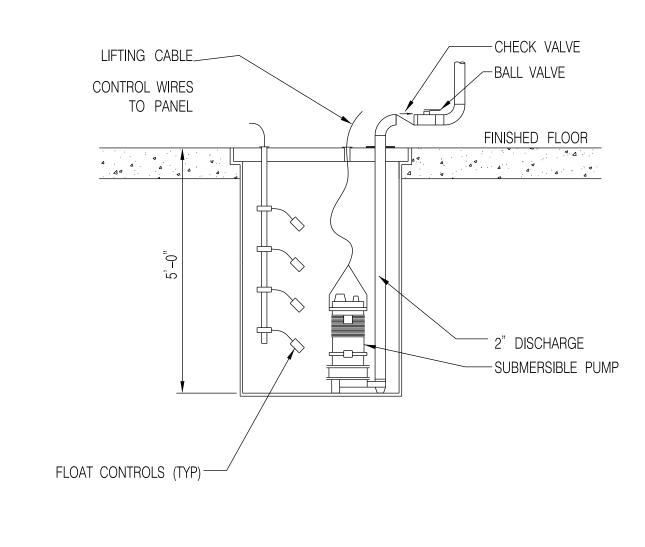
NOTE: SEE TYPICAL PIPE HANGER SUPPORTS DETAIL FOR BLOCKING AND SADDLE.



C ELECTRIC HEAT TRACE
P-501 SCALE: NOT TO SCALE
REF:

INSTALLATION AT

<u>VALVES</u>



D DUPLEX SUMP PUMP
P-501 SCALE: NOT TO SCALE

NOTE: PROVIDE WITH HEATING CABLE.

	PUMP SCHEDULE														
	CAPACITY ELECTRICAL DATA														
UNIT ID	SERVICE	LOCATION	TYPE	GPM	HEAD (FT)	HP	HP RPM		BASIS OF DESIGN	NOTES					
SP-1	SUMP PIT	SUMP ROOM	SUBMERSIBLE	10	25	1/2	1750	115/1	WEIL						
SP-2	SUMP PIT	SUMP ROOM	SUBMERSIBLE	10	25	1/2	1750	115/1	WEIL						

1. CAPACITIES INDICATED ARE FOR EACH PUMP

INSTALLATION

DETAIL

2. SUMP PUMPS ARE CONFIGURED IN SINGLE DUPLEX SYSTEM

3. PROVIDE SUMP PUMP SYSTEM WITH WALL MOUNTED CONTROL PANEL

PROFESSIONAL CERTIFICATION.

I HEREBY CERTIFY THAT THESE DOCUMENTS
WERE PREPARED OR APPROVED BY ME, AND
THAT I AM A DULY LICENSED PROFESSIONAL
ENGINEER UNDER THE LAWS OF THE STATE
OF MARYLAND, LICENSE NO. ______XX
EXPIRATION DATE: XX



				MONTGOMERY COUNTY DEPARTMENT OF TRANSPORTATE GAITHERSBURG, MARYLAND	ION	
				RECOMMENDED FOR APPROVAL		
				Chief, Transportation Planning and Design Section APPROVED	Date	
				Chief, Division of Transportation Engineering	Date	SC
NO.	REVISION	DATE	BY	Designed by: <u>NEA</u> Drawn by: <u>PBF</u> Check	ed by: <u>CAH</u>	

PLUMBING SCHEDULES AND SCHEDULES

P-501

CAPITAL CRESCENT TRAIL UNDER MD 355 BETHESDA, MARYLAND

 SCALE : NOT TO SCALE
 FEBRUARY 2020

 Project No. : _501316_
 SHEET __112____ of __169___

LIGHTING

LED LINEAR SURFACE-MOUNTED FIXTURE

LED FIXTURE CONNECTED TO EMERGENCY LIGHTING INVERTER CIRCUIT

EXIT LIGHTING FIXTURE, ARROW, INDICATES DIRECTION

LIGHTING FIXTURE TYPE SYMBOL (SEE LIGHTING FIXTURE SCHEDULE ON DRAWING E-4)

SWITCHES

SINGLE POLE SWITCH, 20A, 120-277V

RECEPTACLES

SINGLE RECEPTACLE, 20A, 125V AC. MOUNT 1'-6" AFF (UON)

 \Rightarrow DUPLEX CONVENIENCE RECEPT., 20A, 125V AC, MOUNT 1'-6" AFF (UON)

 \Rightarrow_{G} DUPLEX CONVENIENCE RECEPTACLE 20A, 125V AC. SUBSCRIPT "G" INDICATES GFCITYPE, MOUNT 18" AFF (UON)

+ DOUBLE DUPLEX RECEPTACLE 20A, 125V AC.

MOUNT 18" AFF (UON)

SPECIAL PURPOSE RECEPTACLE AS INDICATED.

PANELBOARDS

ELECTRICAL PANELBOARD (208Y/120V, 3PH, 4W)

ELECTRICAL PANELBOARD (480Y/277V, 3PH, 4W)

480V TO 120/208V DRY TYPE XFMR (KVA RATING AS INDICATED)

SAFETY SWITCHES/BREAKERS/STARTERS

NON-FUSED DISCONNECT SWITCH, SUBSCRIPT INDICATES AMPACITY AND NUMBER OF POLES

FUSED DISCONNECT SWITCH, SUBSCRIPT INDICATES FUSED SIZE AND NUMBER OF POLES

MAGNETIC MOTOR STARTER, SUBSCRIPT INDICATES NEMA SIZE 2, NEMA SIZE 1 STARTER UON

2 \(\sum \subseteq \text{603} \) MAGNETIC MOTOR STARTER, SUBSCRIPT INDICATES NEMA SIZE 2, NEMA SIZE 1 STARTER UON. 60 = SWITCH SIZE AND 3 = NO. OF POLE. 30AMPS, 3 POLES UON

MANUAL MOTOR STARTER SWITCH WITH OVERLOAD AND RED PILOT LIGHT. PROVIDE HOA AS REQUIRED

ENCLOSED CIRCUIT BREAKER, SIZE AS INDICATED

TIMER SWITCH

EQUIPMENT CONNECTION

MOTOR, NUMBER INDICATES HORSEPOWER

ELECTRIC UNIT HEATER

JUNCTION BOX

EQUIPMENT CONNECTION AS NOTED

MISCELLANEOUS

CONSTRUCTION NOTE CALL-OUT.

DEMOLITION NOTE CALL-OUT.

✓ ✓ DRAWING NUMBER WHERE SHOWN

- SECTION NUMBER

- DETAIL NUMBER

- DRAWING NUMBER WHERE SHOWN

EMERGENCY SYSTEM

GENERATOR

AUTOMATIC TRANSFER SWITCH

WIRING

BRANCH CIRCUIT HOMERUN TO PANELBOARD, XX DENOTES TO PANEL XX AND NUMERALS IDENTIFY CIRCUIT NUMBERS. ARROWS DENOTE NO. OF CIRCUITS

CONDUIT WITH WIRES, #12 AWG IN 3/4"C. UNLESS OTHERWISE NOTED, NUMBER OF CONDUCTORS AS REQUIRED. ALL SINGLE PHASE 120V AND 277V CIRCUITS SHALL BE PROVIDED WITH SEPARATE NEUTRAL CONDUCTORS.

BRANCH CIRCUIT OR FEEDER WIRING IN CONDUIT.

INDICATES A CONDUIT RUN CONCEALED IN CEILING, WALL, FLOOR, OR ABOVE SUSPENDED CEILING (UON)

EXPOSED CONDUIT RUN AS INDICATED.

CONDUIT TURNED UP CONDUIT TURNED DOWN

ABBREVIATIONS

A AC AFF AFG AHU AUX AWG	AMPERES ALTERNATING CURRENT ABOVE FINISHED FLOOR ABOVE FINISHED GRADE AIR HANDLING UNIT AUXILIARY AMERICAN WIRE GUAGE	MCB MCC MH MIN MLO MOD MOV MTD	MAIN CIRCUIT BREAKER MOTOR CONTROL CENTER MOUNTING HEIGHT MINIMUM MAIN LUGS ONLY MOTOR OPERATED DAMPER MOTOR OPERATED DAMPER MOUNTED
BLDG BKR	BUILDING BREAKER	MTG	MOUNTING
C CB CKT	CONDUIT CIRCUIT BREAKER CIRCUIT	N NEC NEMA	NEUTRAL NATIONAL ELECTRICAL CODE NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION
DC DN DWH	DIRECT CURRENT DOWN DOMESTIC WATER HEATER	NFSS NIC NTS	NON FUSED SAFETY SWITCH NOT IN CONTRACT NOT TO SCALE
EA EBH EF EH ELECT ELEV EMERG. EQUIP ER ETR EWC EWH EX, EXIST	EACH ELECTRIC BASEBOARD HEATER EXHAUST FAN ELECTRIC HEATER ELECTRICAL ELEVATION EMERGENCY EQUIPMENT EXISTING TO BE RELOCATED EXISTING TO REMAIN ELECTRIC WATER COOLER ELECTRIC WALL HEATER EXISTING	P PB PH PL PLC PNL PT PVC PWR PH, Ø (R) RECEPT REQ'D	POLE PUSH BUTTON PHASE PILOT LIGHT PROGRAMMABLE LOGIC CONTROLLER PANELBOARD POTENTIAL TRANSFORMER POLYVINYL CHLORIDE POWER PHASE DEVICE IN NEW LOCATION RECEPTACLE REQUIRED
FA FA FAAP FACP FCU FDR FIXT FL FLEX FMC FS FSS	FRAME AMPS FIRE ALARM FIRE ALARM ANNUNCIATOR PANEL FIRE ALARM CONTROL PANEL FAN COIL UNIT FEEDER FIXTURE FLOOR FLEXIBLE FLEXIBLE FLEXIBLE METAL CONDUIT FLOW SWITCH FUSED SAFETY SWITCH	RM RMS STOR SW SWBD SWGR SYMM SYS	ROOM ROOT MEAN SQUARE STORAGE SWITCH SWITCHBOARD SWITCHGEAR SYMMETRICAL SYSTEM TRIP AMPS TYPICAL
G GFI	GROUND GROUND FAULT INTERRUPTER	UH UG	UNIT HEATER UNDERGROUND
HP HPS HTR	HORSEPOWER HIGH PRESSURE SODIUM HEATER	UON V VFD	UNLESS OTHERWISE NOTED VOLTS OR VOLTAGE VARIABLE FREQUENCY DRIVE
IC JB	INTERRUPTING CAPACITY JUNCTION BOX THOUSAND AMPERES INTERRUPTING CAPACITY	W W W	WATTS WIRE WITH
KAIC KV KVA	THOUSAND AMPERES INTERRUPTING CAPACITY KILOVOLT KILOVOLT AMPERE	WP XFMR	WEATHERPROOF TRANSFORMER
LTG	LIGHTING		

E-001

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 28792 EXPIRATION DATE: 6-10-2021



						E-0
			MONTGOMERY COUNDEPARTMENT OF TRANSPORTED GAITHERSBURG, MARYL	ORTATION	ELECTRICAL LEGEND	AND ABBREVIATIONS
			RECOMMENDED FOR APPROVAL Chief, Transportation Planning and Design Section APPROVED	Date	UNDER	ESCENT TRAIL MD 355 , MARYLAND
			Chief, Division of Transportation Engineering	Date	SCALE : NOT TO SCALE	FEBRUARY 2
REVISION	DATE	BY	Designed by: <u>EMK</u> Drawn by: <u>AGT</u>	Checked by: <u>IHK</u>	Project No. : <u>501316</u>	SHEET <u>134</u> of <u>16</u> 9

MARYLAND FEBRUARY 2020 SHEET <u>134</u> of <u>169</u>

GENERAL NOTES

- 1. INSTALLATION OF ALL ELECTRICAL WORK SHALL CONFORM TO THE LATEST ADOPTED EDITION OF THE NATIONAL ELECTRICAL CODE (NFPA 70), AND ALL APPLICABLE LOCAL CODES.
- 2. CONDUIT RUNS ARE SHOWN DIAGRAMMATICALLY ONLY AND SHALL BE INSTALLED IN A MANNER TO PREVENT CONFLICTS WITH EQUIPMENT AND STRUCTURAL CONDITIONS. EXPOSED CONDUITS ABOVE SUSPENDED CEILING AND IN FURRED WALLS SHALL BE INSTALLED PARALLEL TO THE BEAMS AND WALLS.
- 3. PROVIDE ALL REQUIRED PULL BOXES AND JUNCTION BOXES FOR INSTALLATION OF THE WIRING IN ACCORDANCE WITH THE CONTRACT SPECIFICATIONS THOUGH THE BOXES MAY NOT BE INDICATED ON THE DRAWINGS.
- 4. THE WIRING DIAGRAMS, QUANTITY AND SIZE OF WIRES AND CONDUITS ARE BASED UPON SELECTED STANDARD COMPONENTS OF ELECTRICAL EQUIPMENT. MODIFICATIONS, APPROVED BY THE ENGINEER, MAY BE MADE BY THE CONTRACTOR AT HIS EXPENSE TO ACCOMMODATE EQUIPMENT PURCHASED.
- 5. PROVIDE ALL NECESSARY COMPONENTS REQUIRED FOR MAKING FINAL CONNECTION OF ALL EQUIPMENT INSTALLED AS PART OF THIS CONTRACT.
- 6. ALL INDICATION AND CONTROL WIRING IN JUNCTION BOXES SHALL BE WIRED TO NUMBERED TERMINAL STRIPS AND IDENTIFIED AS TO START AND END OF RUN.
- 7. ALL ELECTRICAL EQUIPMENT INSTALLED AGAINST CONCRETE OR MASONRY WALLS SHALL BE INSTALLED WITH A 1/4" SPACE BETWEEN THE EQUIPMENT AND THE MOUNTING SURFACE, SPACERS SHALL BE STAINLESS STEEL, PVC OR NYLON.
- 8. ALL JUNCTION AND PULL BOXES SHALL BE LABELED WITH THEIR VOLTAGE AND USAGE.
- 9. DRAWINGS ARE DIAGRAMMATIC, ACTUAL LOCATION OF EQUIPMENT TO BE DETERMINED IN THE FIELD. NEW EQUIPMENT SHALL FIT INTO AVAILABLE SPACE.
- 10. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE EQUIPMENT WHICH MEETS THE SPACE REQUIREMENT. COORDINATE WORK SCHEDULE WITH OWNER.
- 11. CONTRACTOR SHALL SUBMIT A LIST OF ALL MAJOR EQUIPMENT AND FIXTURES TO THE ENGINEER FOR REVIEW AND APPROVAL. NO SUBSTITUTIONS WILL BE ALLOWED WITHOUT THE PERMISSION OF THE ENGINEER IN WRITING. ALL EQUIPMENT SHALL BE NEW AND BEAR THE MANUFACTURER'S NAME AND TRADE NAME.ALL EQUIPMENT SHALL BE UL LISTED.
- 12. ALL CONDUITS IN FINISHED AREAS SHALL BE RUN CONCEALED, UON.
- 13. THE CIRCUIT NUMBERS ARE FOR IDENTIFICATION PURPOSE ONLY. THE CONTRACTOR IS RESPONSIBLE FOR BALANCING LOADS AND CORRECTLY PHASING THE CIRCUITS IN PANELBOARDS.
- 14. ALL PANELBOARD BUSSES (PHASE, NEUTRAL AND GROUND) SHALL BE COPPER, UON.
- 15. ALL TRANSFORMER WIDINGS SHALL BE COPPER, UON.
- 16. PANELS SERVING ELECTRONIC EQUIPMENT AND COMPUTERS SHALL BE 200% NEUTRALS. TRANSFORMERS FEEDING ALL 200% PANELS SHALL BE K-13 RATED TYPE.
- 17. ELECTRICAL REQUIREMENTS FOR MECHANICAL EQUIPMENT ARE BASED ON EQUIPMENT SPECIFIED. COORDINATE EXACT REQUIREMENTS WITH MECHANICAL SHOP DRAWINGS PRIOR TO ORDERING AND INSTALLING EQUIPMENT.
- 18. ALL 120 VOLT RECEPTACLE BRANCH CIRCUITS LONGER THAN 100 FEET FROM PANELBOARD TO LAST OUTLET SHALL UTILIZE #10AWG OR LARGER WIRES.
- 19. CONTRACTOR SHALL VERIFY ALL DOOR SWINGS BEFORE SETTING SWITCHES. INSTALL SWITCHES ON THE LOCK SIDE OF DOORS 4 FEET AFF, UON.
- 20. WHERE ELECTRICAL INSTALLATIONS DEPEND UPON WORK OF OTHER TRADES. THE ELECTRICAL CONTRACTOR SHALL ENSURE THAT NECESSARY INSTRUCTIONS, TEMPLATES, MATERIALS, ETC. ARE PROVIDED AND SUPERVISE THE WORK OF THE OTHER TRADES FOR QUALITY AND CODE COMPLIANCE.
- 21. CABLE TRAY INSTALLATION SHALL BE COORDINATED IN FIELD WITH OTHER TRADES.
- 22. OPENINGS AND PASSAGE OF CONDUITS OR WIREWAYS THROUGH FLOOR SLABS AND FIRE RATED WALLS OR PARTITIONS SHALL BE PROVIDED WITH UL LISTED FIRE RATED SLEEVING SYSTEMS AS MANUFACTURED BY PROSET SYSTEMS INC.
- 23. DO NOT INSTALL MORE THAN THREE CIRCUITS IN ONE HOMERUN, UON.
- 24. NUMBER ADJACENT TO LIGHT, RECEPTACLE OR OTHER DEVICES INDICATES PANEL SERVING THE DEVICE OR EQUIPMENT AND CIRCUIT NUMBER. PROVIDE COMPLETE WIRING IN CONDUIT.
- 25. SERIES RATING OF CIRCUIT BREAKERS SHALL NOT BE ALLOWED.
- 26. ALL WORK SHOWN ON THE DRAWINGS SHALL BE NEW, UON.
- 27. CONTRACTOR SHALL TEST PIT TO DETERMINE LOCATION OF EXISTING UTILITIES BEFORE CONSTRUCTION OF NEW DUCTBANK AND MANHOLE. SUBMIT DUCTBANKS AND MANHOLE PROFILE AND PLAN DRAWINGS FOR APPROVAL BY THE ENGINEER. NEW DUCTBANK AND MANHOLE SHALL COORDINATE WITH EXISTING AND OTHER NEW UTILITIES. DUCTBANK PROFILES ARE INDICATED ON CIVIL DRAWINGS. MODIFY PROFILES TO SUIT EXISTING CONDITIONS. INCREASE DEPTH OF THE MANHOLE IF REQUIRED TO SUIT DUCTBANK INSTALLATION.
- 28. CONTRACTOR SHALL COORDINATE ALL WORK RELATED TO ELECTRICAL SERVICE WITH UTILITY COMPANY AND OBTAIN APPROVAL BEFORE INSTALLATION.
- 29. PROVIDE PULL STRINGS IN ALL EMPTY CONDUIT TO FACILITATE PULLING OF CABLES IN FUTURE.
- 30. ALL RECEPTACLES SHALL BE GFCI, TAMPER RESISTANT TYPE WITH WEATHERPROOF-WHILE-IN-USE COVER, UON.
- 31. ALL ELECTRICAL EQUIPMENT LOCATED OUTDOORS SHALL HAVE NEMA 4X ENCLOSURE, UON.
- 32. ALL 120V CIRCUITS AND 277V CIRCUITS SHALL HAVE SEPERATE NEUTRALS.
- 33. ALL OUTDOOR UNDERGROUND CONCRETE ENCASED CONDUITS SHALL BE PVC SCHEDULE 40, UON.
- 34. ALL OUTDOOR UNDERGROUND DIRECT BURIED CONDUITS SHALL BE PVC SCHEDULE
- 35. MINIMUM CONDUIT SIZE SHALL BE 3 /4".
- 36. MINIMUM WIRE SIZE SHALL BE #12 AWG.
- 37. PROVIDE SYSTEM GROUNDING CONDUCTORS AND EQUIPMENT GROUNDING CONDUCTORS IN ACCORDANCE WITH NEC-250, UON.

DEFINITIONS

- 1. FURNISH: SUPPLY AND DELIVER TO PROJECT SITE. READY FOR UNLOADING, UNPACKING, ASSEMBLY, INSTALLATION, AND SIMILAR OPERATIONS.
- 2. INSTALL: UNLOAD, TEMPORARILY STORE, UNPACK, ASSEMBLE, ERECT, PLACE, ANCHOR, APPLY, WORK TO DIMENSION, FINISH, CURE, PROTECT, CLEAN AND SIMILAR OPERATIONS AT PROJECT SITE.
- 3. PROVIDE: FURNISH AND INSTALL, COMPLETE AND READY FOR INTENDED USE.
- 4. WIRING: INSTALL CONDUIT AND WIRES/CONDUCTORS.
- 5. DEMOLISH/REMOVE: DETACH ITEMS FROM EXISTING CONSTRUCTION AND DISPOSE OF THEM OFF-SITE UNLESS INDICATED TO BE SALVAGED OR REINSTALLED.
- 6. REMOVE AND SALVAGE: DETACH FROM EXISTING CONSTRUCTION, IN A MANNER TO PREVENT DAMAGE AND DELIVER TO OWNER READY FOR REUSE.
- 7. RELOCATE: DETACH FROM EXISTING CONSTRUCTION, IN A MANNER TO PREVENT DAMAGE, PREPARE FOR REUSE, AND REINSTALL WHERE INDICATED.

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PROFESSIONAL CERTIFICATION.



				MONTGOMERY COUN DEPARTMENT OF TRANSP GAITHERSBURG, MARY
				RECOMMENDED FOR APPROVAL
				Chief, Transportation Planning and Design Section APPROVED
				Chief, Division of Transportation Engineering
NO.	REVISION	DATE	BY	Designed by: <u>EMK</u> Drawn by: <u>AGT</u>

MONTGOMERY COUNTY DEPARTMENT OF TRANSPORTATION GAITHERSBURG, MARYLAND

Transportation Planning and Design Section

CAPITAL CRESCENT TRAIL UNDER MD 355

Checked by: <u>IHK</u>

BETHESDA, MARYLAND FEBRUARY 2020

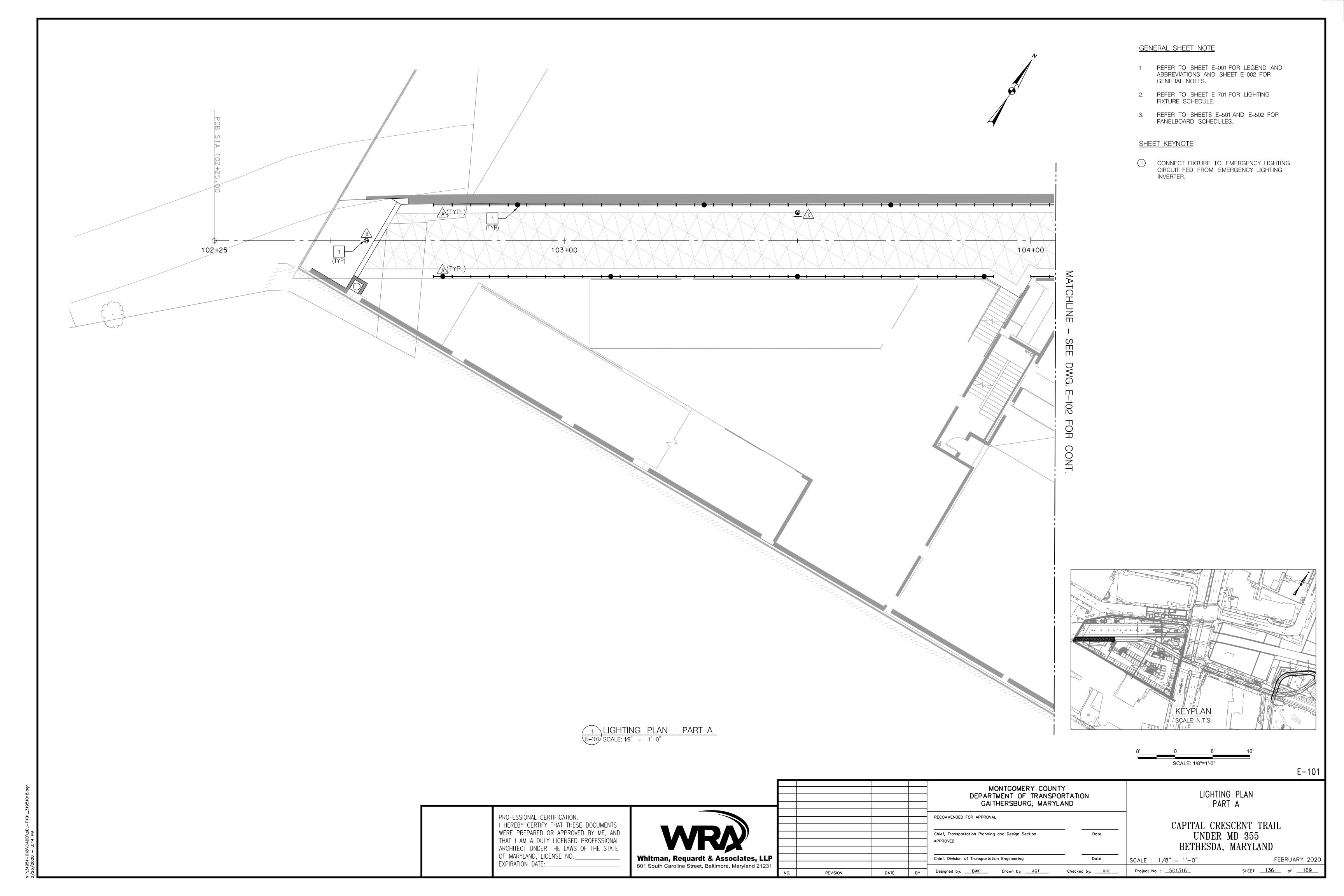
GENERAL AND DEMOLITION NOTES

E-002

SCALE: NOT TO SCALE

Project No. : <u>501316</u>

SHEET <u>135</u> of <u>169</u>

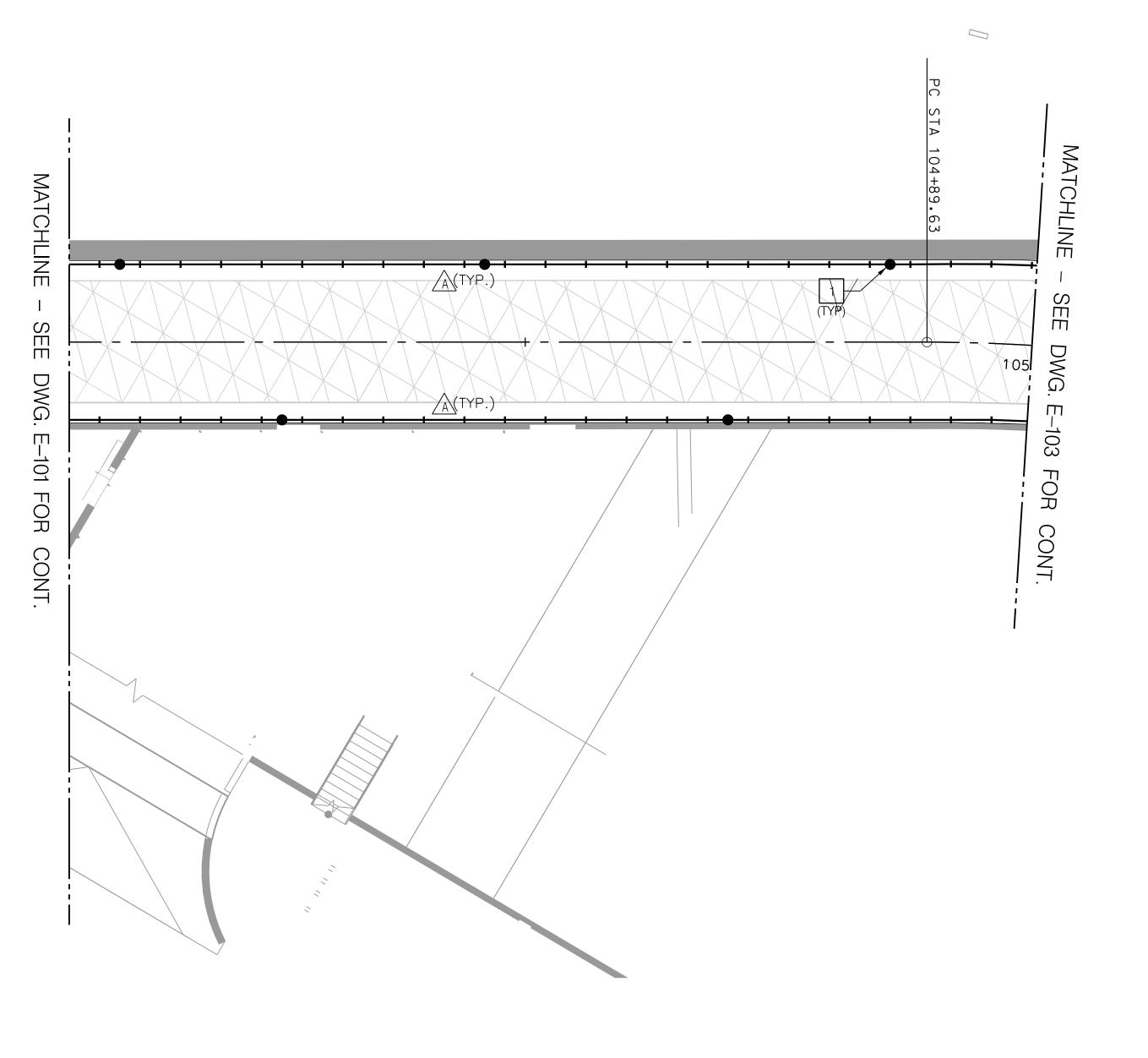


GENERAL SHEET NOTE

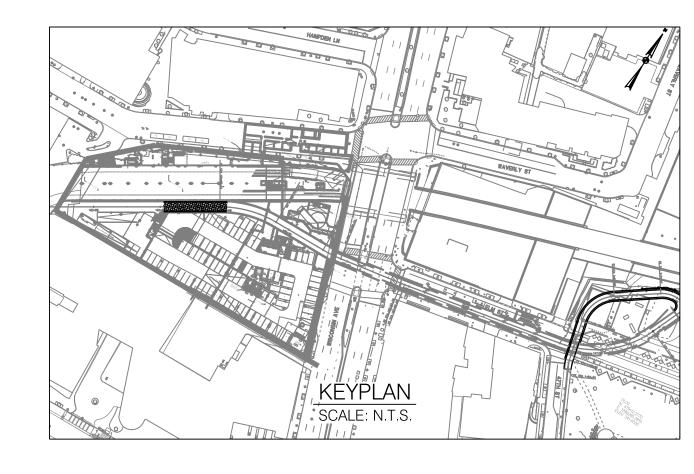
- 1. REFER TO SHEET E-001 FOR LEGEND AND ABBREVIATIONS AND SHEET E-002 FOR GENERAL NOTES.
- 2. REFER TO SHEET E-701 FOR LIGHTING FIXTURE SCHEDULE.
- 3. REFER TO SHEETS E-501 AND E-502 FOR PANELBOARD SCHEDULES.

SHEET KEYNOTE

(1) CONNECT FIXTURE TO EMERGENCY LIGHTING CIRCUIT FED FROM EMERGENCY LIGHTING INVERTER.



1 LIGHTING PLAN – PART B E-102 SCALE: 1/8" = 1'-0"



8' 0 8' SCALE: 1/8"=1'-0"

SCALE : 1/8" = 1'-0"

LIGHTING PLAN PART B

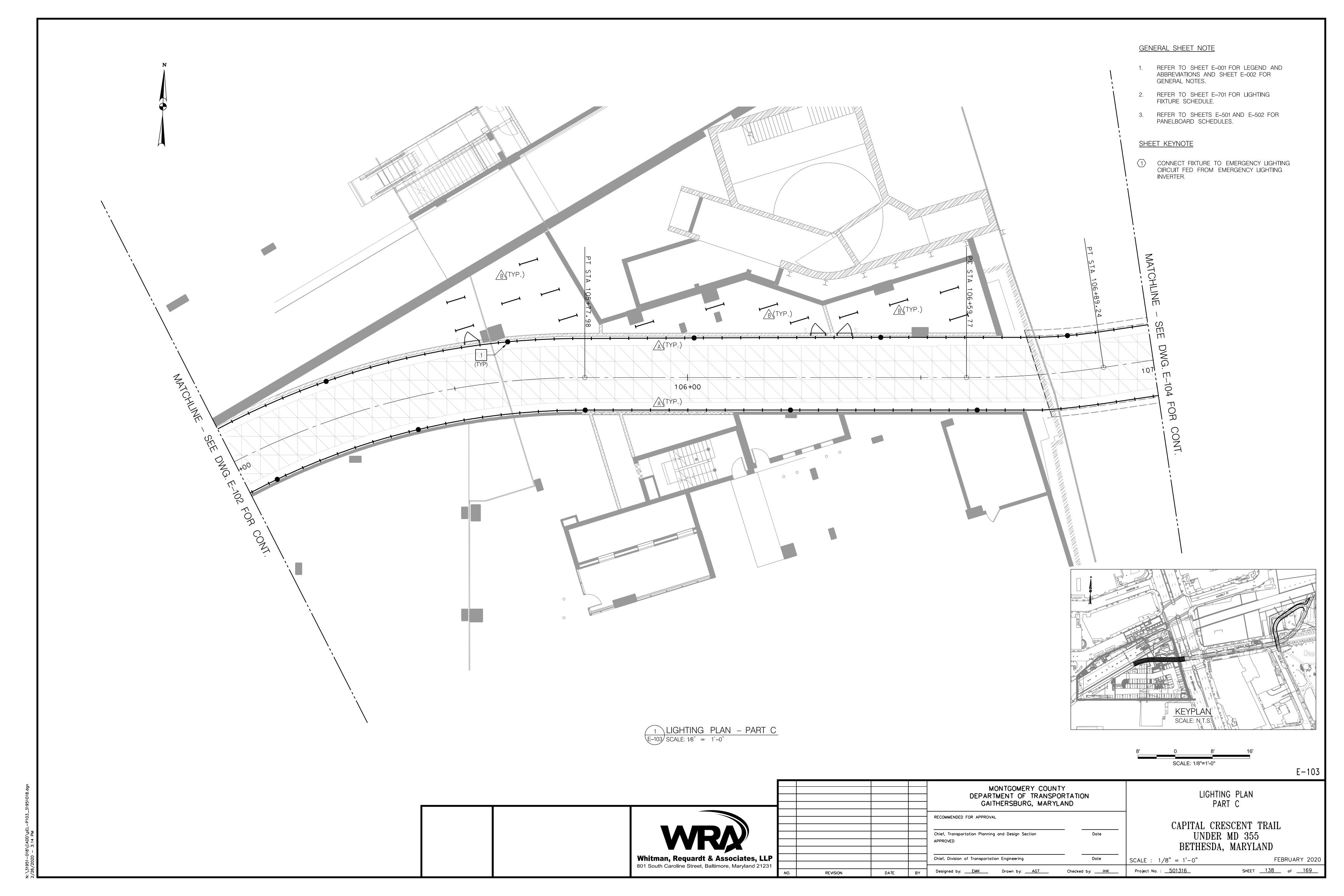
CAPITAL CRESCENT TRAIL UNDER MD 355 BETHESDA, MARYLAND

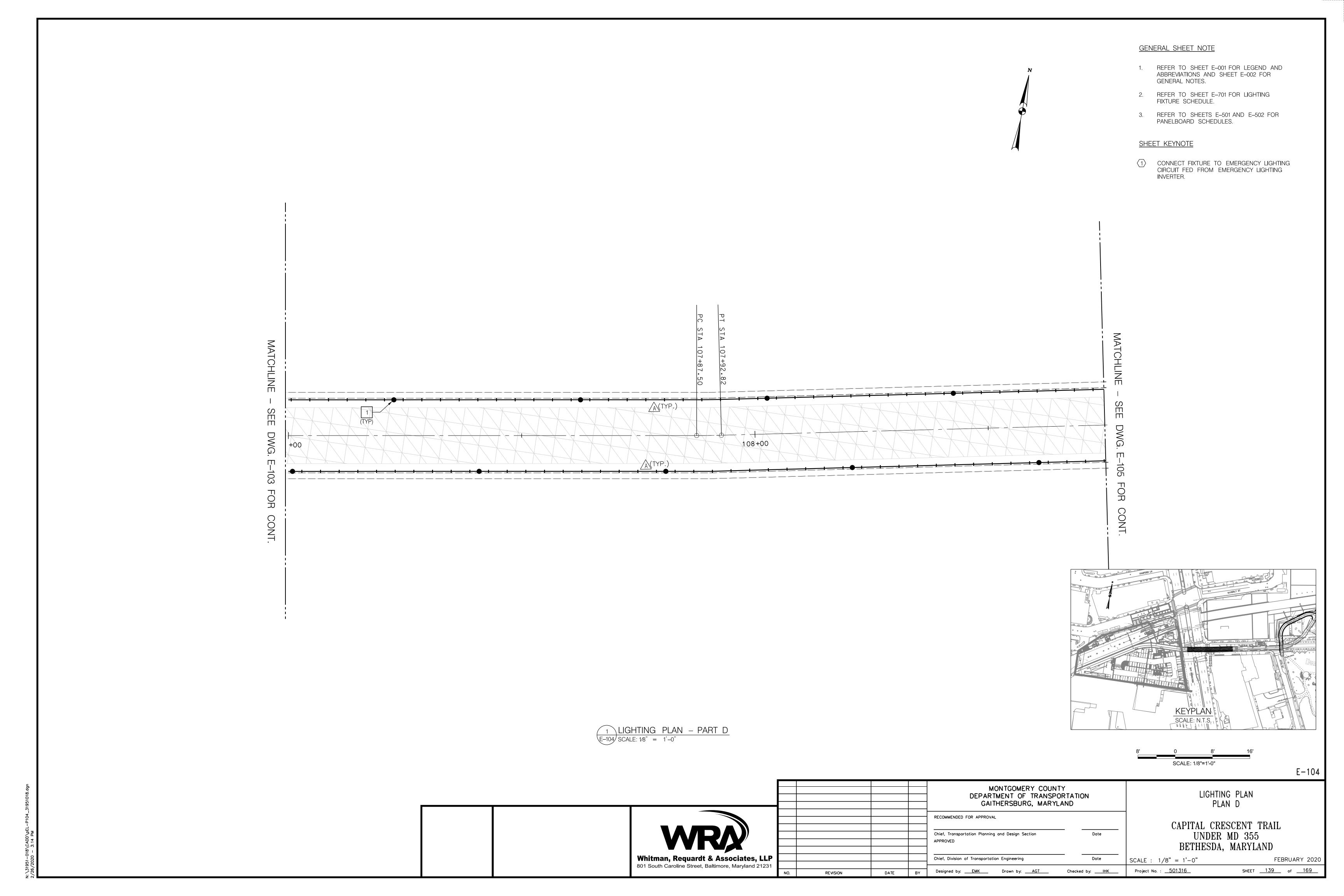
E-102

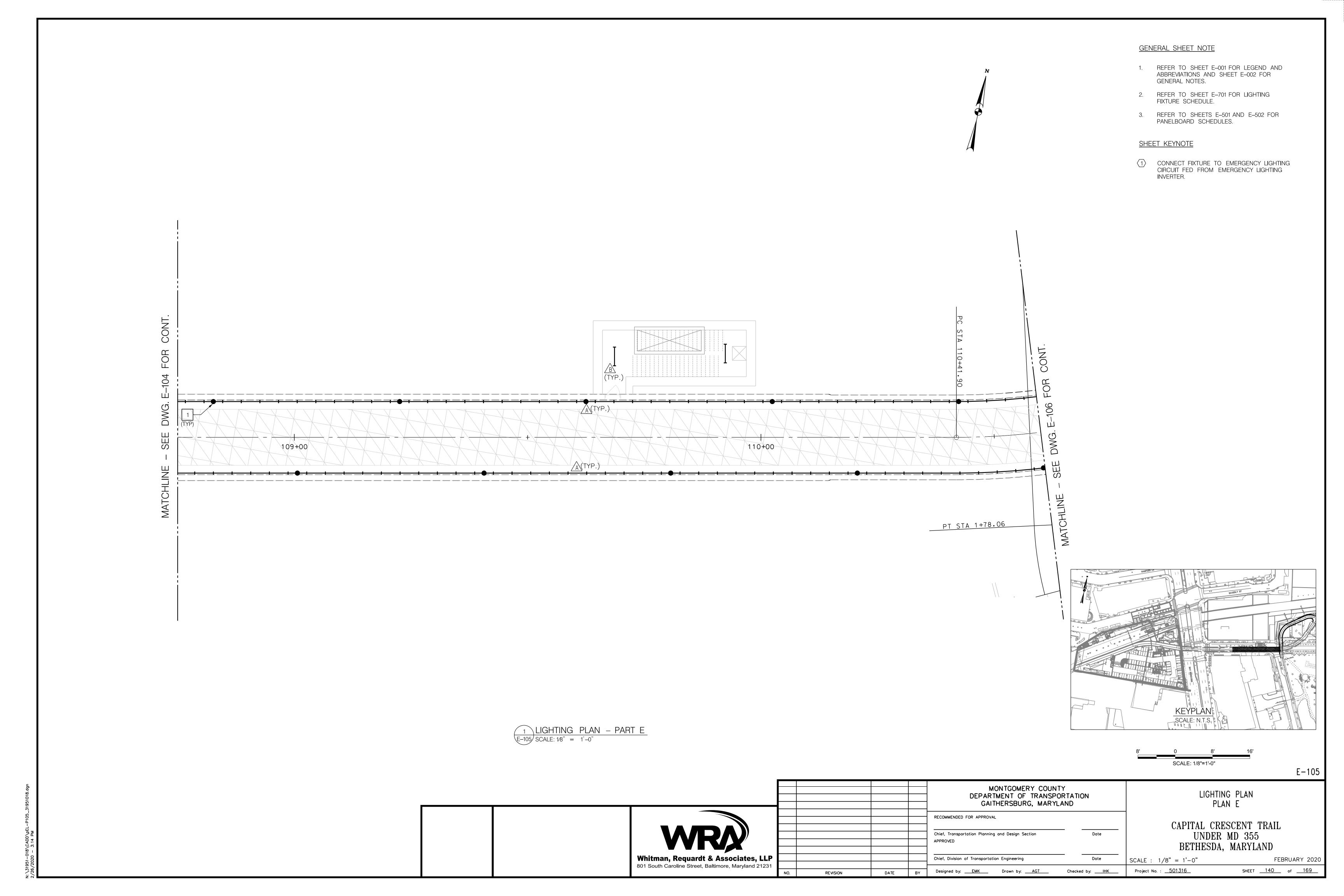
FEBRUARY 2020

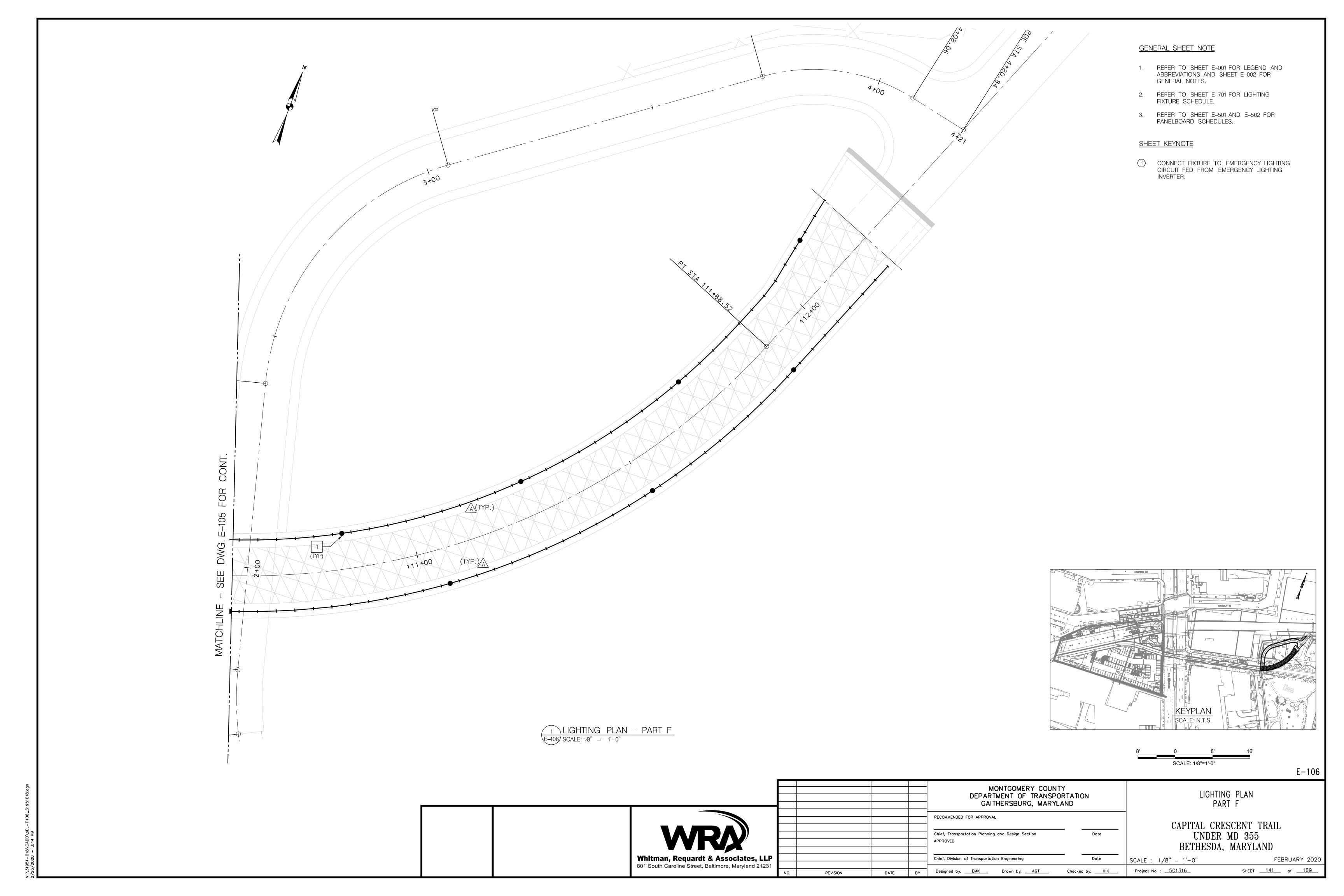
SHEET <u>137</u> of <u>169</u>

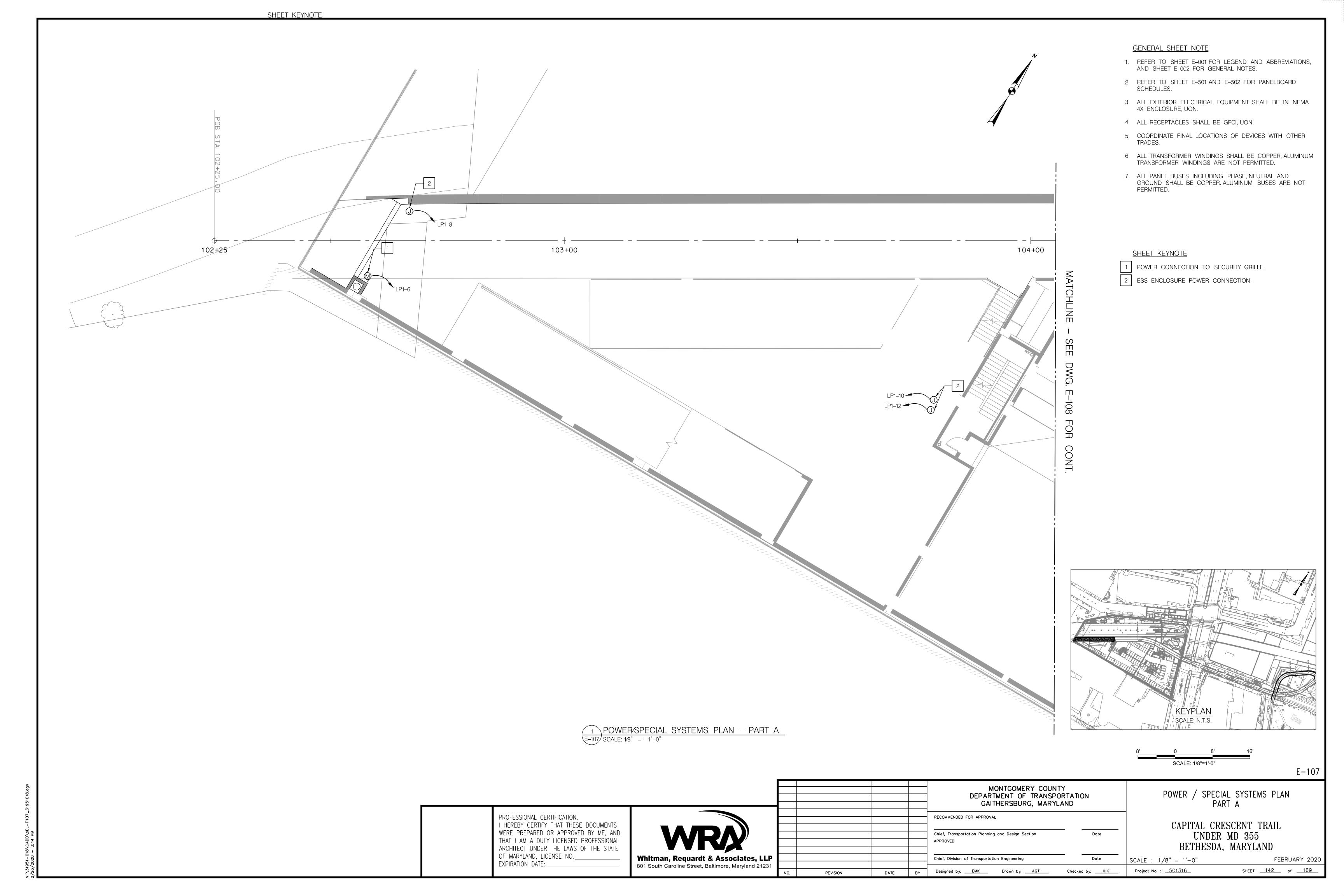
					MONTGOMERY COUNTY DEPARTMENT OF TRANSPORTA GAITHERSBURG, MARYLAND	
					RECOMMENDED FOR APPROVAL	
					Chief, Transportation Planning and Design Section APPROVED	Date
Whitman, Requardt & Associates, LLP					Chief, Division of Transportation Engineering	Date
801 South Caroline Street, Baltimore, Maryland 21231	NO.	REVISION	DATE	BY	Designed by: <u>EMK</u> Drown by: <u>AGT</u> Chec	ecked by:











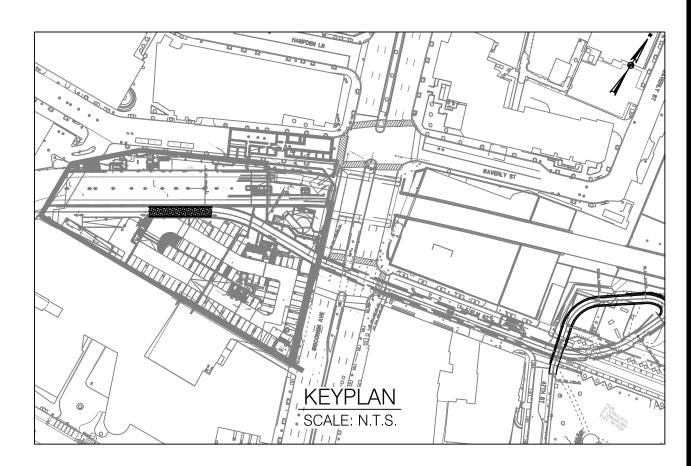
1 POWER/SPECIAL SYSTEMS PLAN - PART B E-108 SCALE: 1/8" = 1'-0"

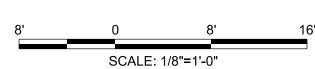
GENERAL SHEET NOTE

- 1. REFER TO SHEET E-001 FOR LEGEND AND ABBREVIATIONS, AND SHEET E-002 FOR GENERAL NOTES.
- 2. REFER TO SHEETS E-501 AND E-502 FOR PANELBOARD SCHEDULES.
- 3. ALL EXTERIOR ELECTRICAL EQUIPMENT SHALL BE IN NEMA 4X ENCLOSURE, UON.
- 4. ALL RECEPTACLES SHALL BE GFCI, UON.
- 5. COORDINATE FINAL LOCATIONS OF DEVICES WITH OTHER TRADES.
- 6. ALL TRANSFORMER WINDINGS SHALL BE COPPER, ALUMINUM TRANSFORMER WINDINGS ARE NOT PERMITTED.
- 7. ALL PANEL BUSES INCLUDING PHASE, NEUTRAL AND GROUND SHALL BE COPPER. ALUMINUM BUSES ARE NOT PERMITTED.

SHEET KEYNOTE

1 XXXXX





POWER / SPECIAL SYSTEMS PLAN PART B

CAPITAL CRESCENT TRAIL UNDER MD 355 BETHESDA, MARYLAND

FEBRUARY 2020 SCALE : 1/8" = 1'-0"

Whitman, Requardt & Associates, LLP 801 South Caroline Street, Baltimore, Maryland 21231

Chief, Division of Transportation Engineering

MONTGOMERY COUNTY
DEPARTMENT OF TRANSPORTATION
GAITHERSBURG, MARYLAND

RECOMMENDED FOR APPROVAL

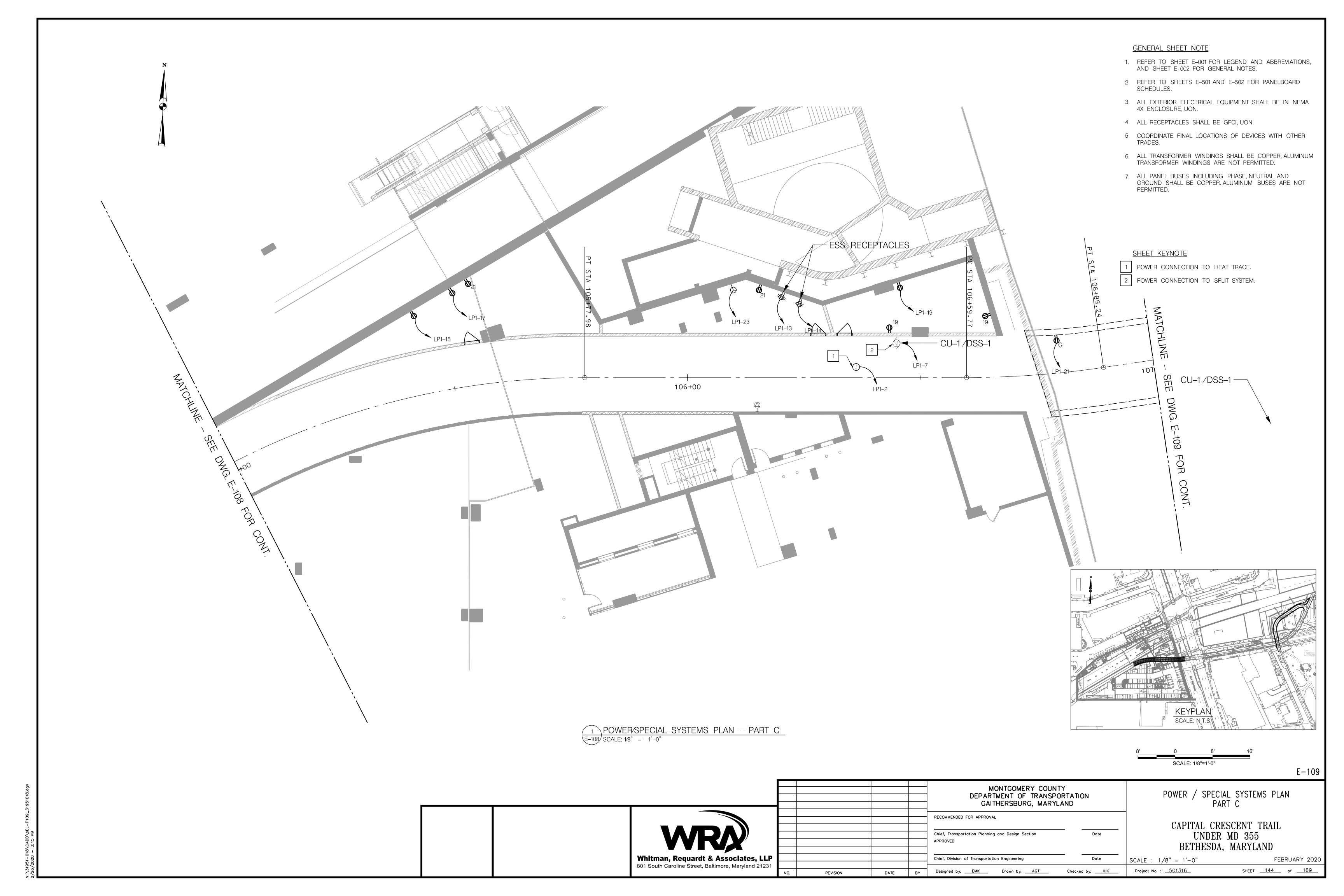
Chief, Transportation Planning and Design Section

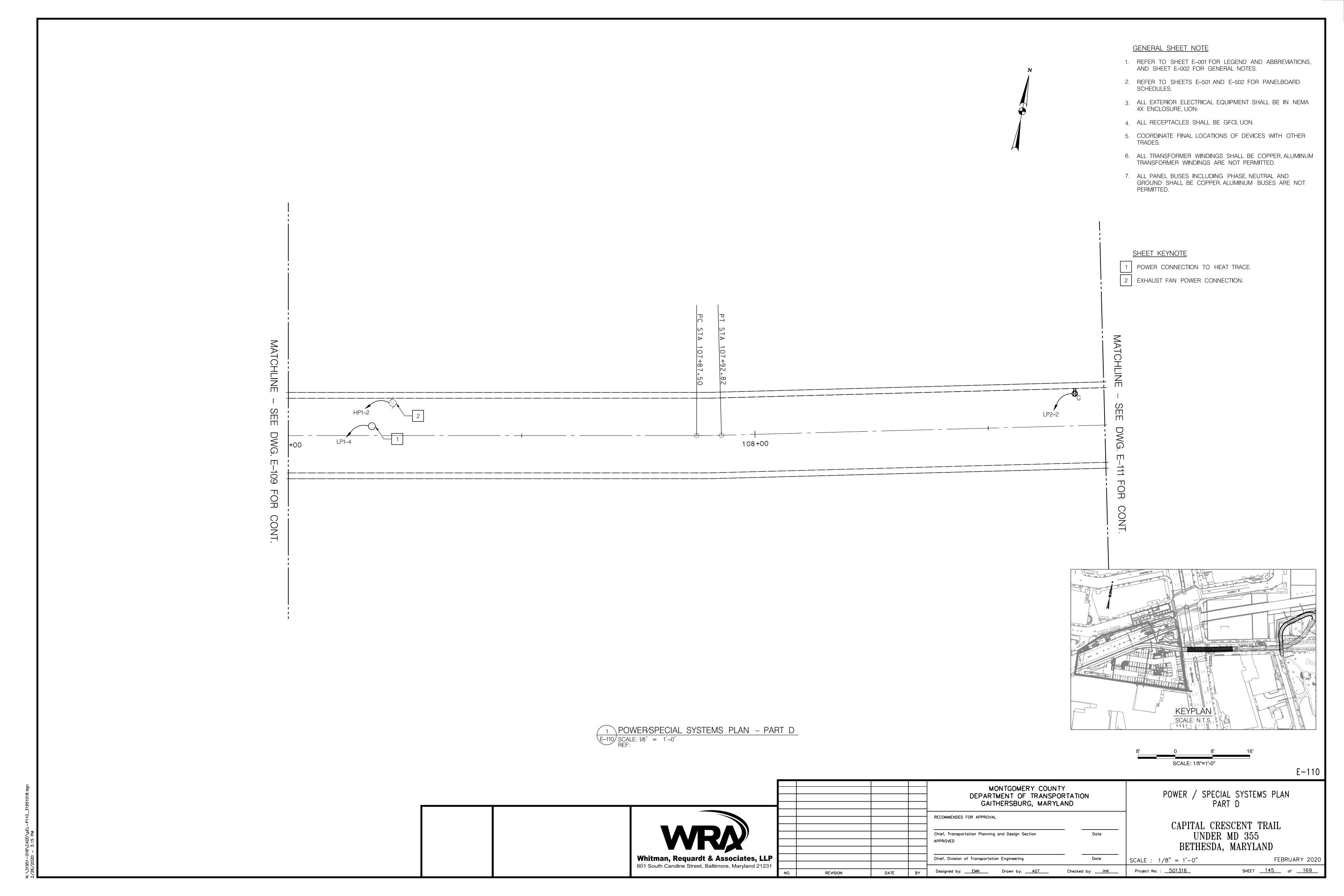
Checked by: IHK

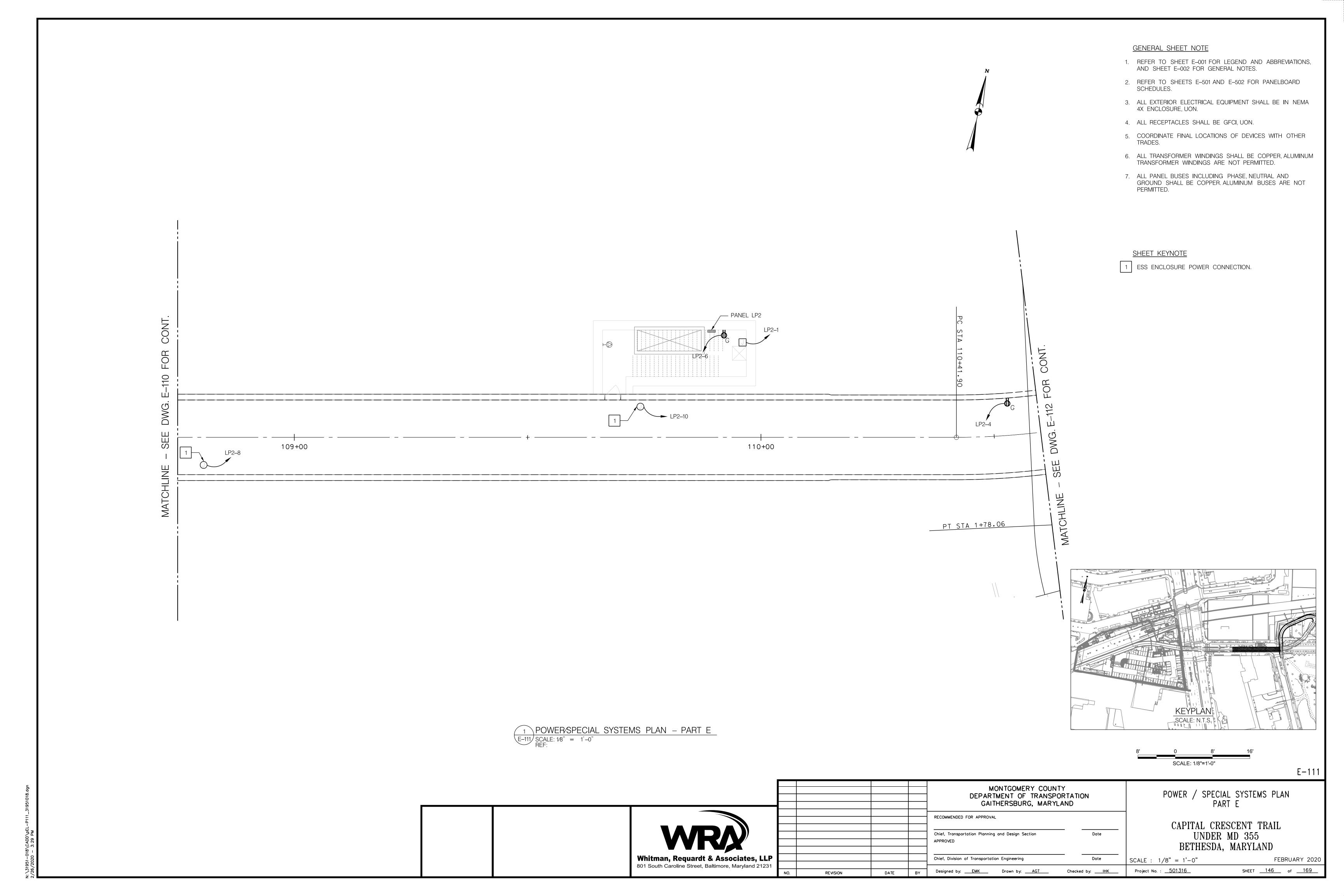
Project No. : <u>501316</u>

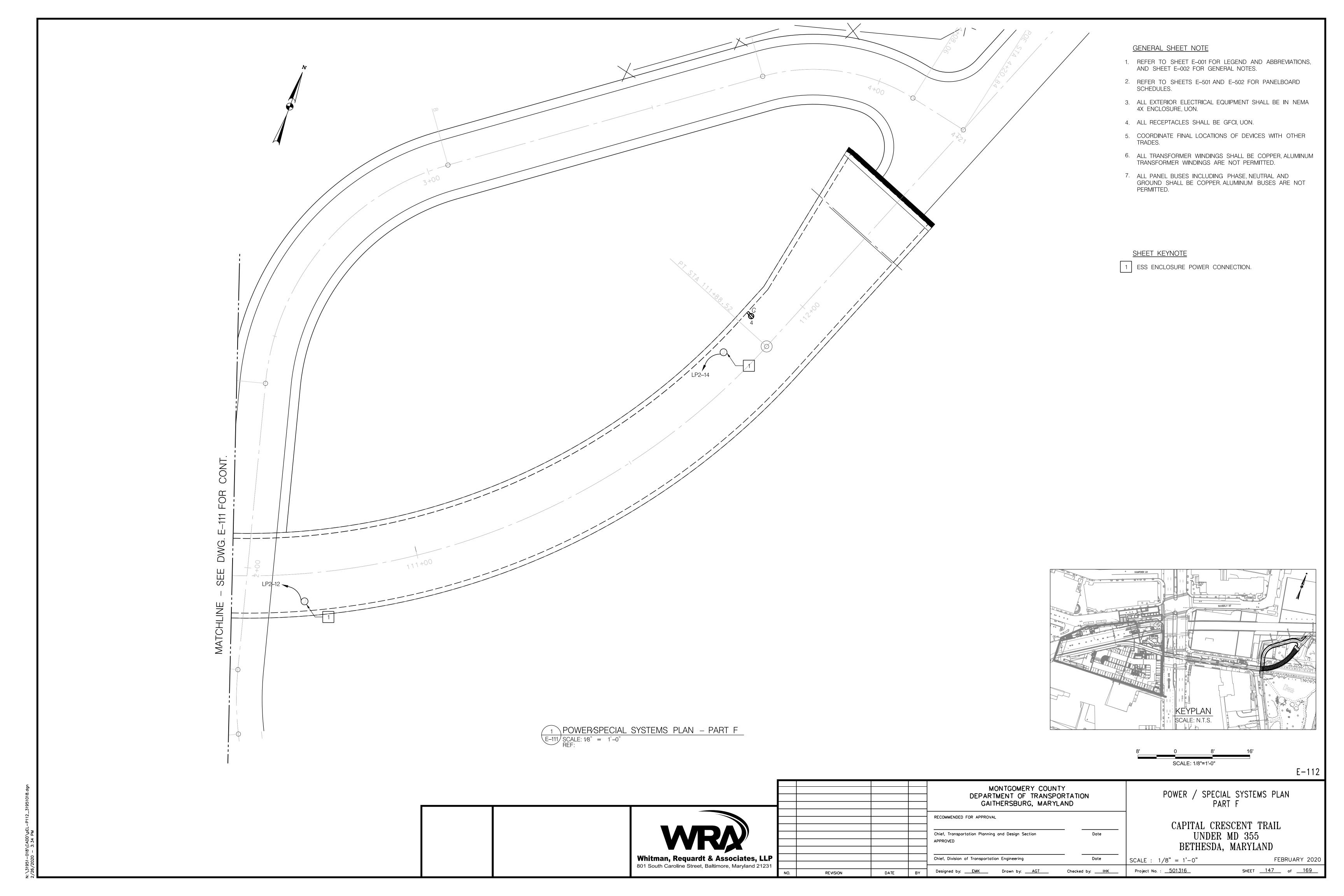
SHEET <u>143</u> of <u>169</u>

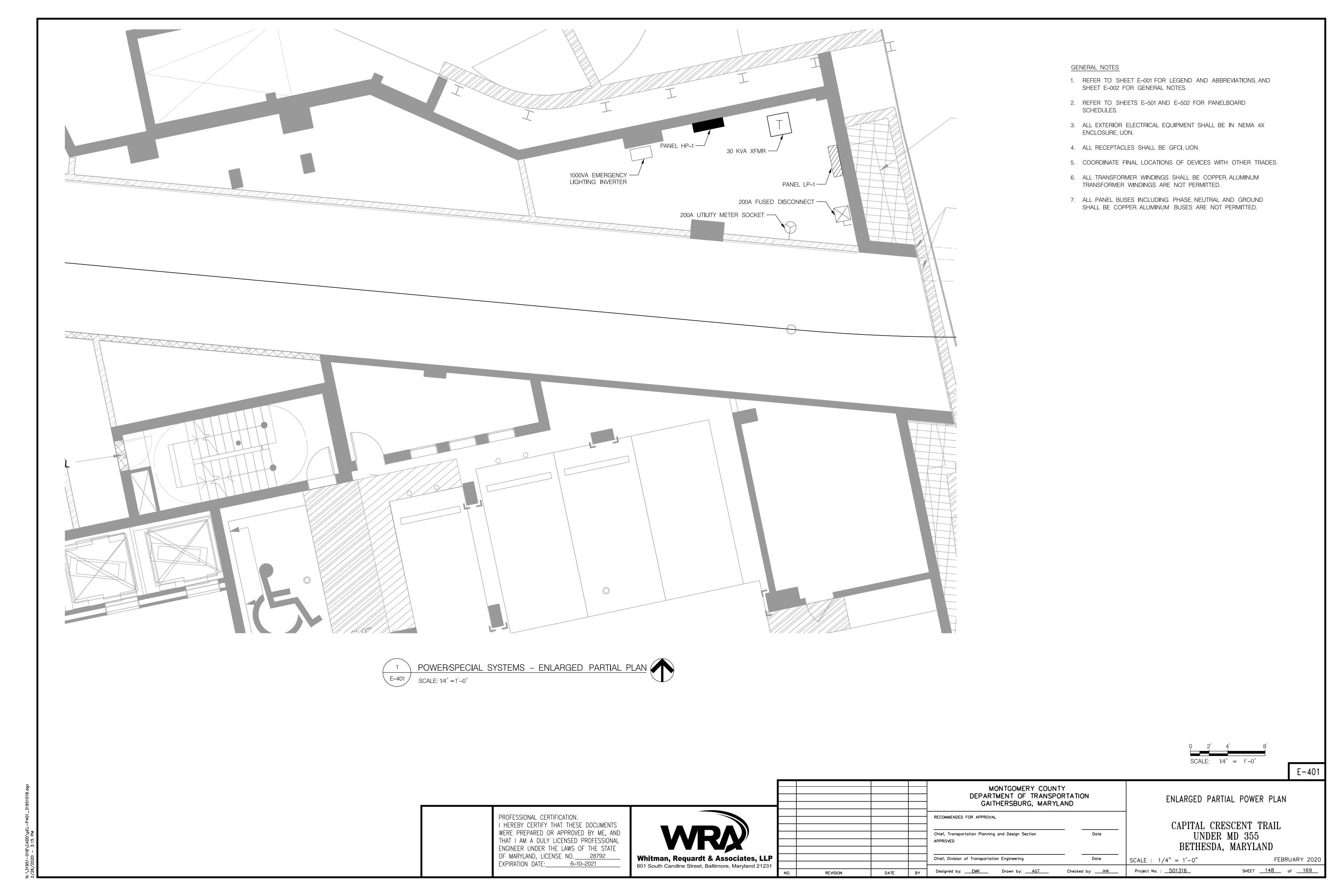
E-108

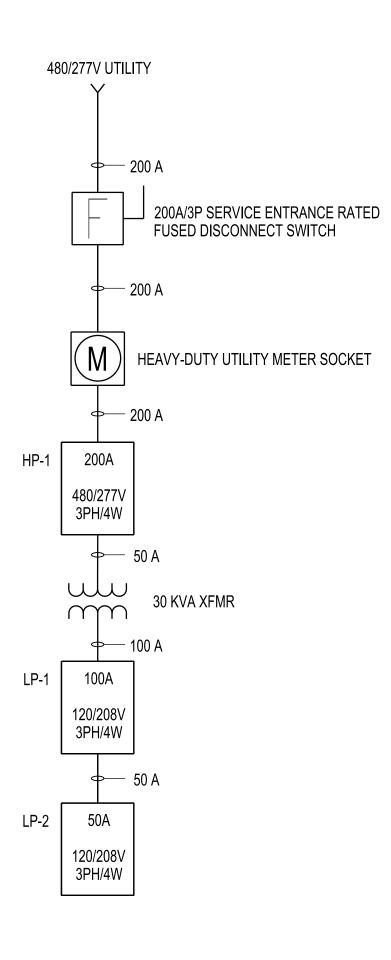












	FEEDER SCHEDULE														
Feeder	СВ	No.	Wire S	Size	Ground Wire	Conduit No.									
No.	Size	Sets			Size	Size inch (")	Remarks								
20	20A	1	4#12		1#12	(1) - 3/4"									
30	30A	1	4#10		1#10	(1) - 3/4"									
50	50A	1	4#6		1#10	(1) - 1"									
100	100A	1	4#1		1#8	(1) - 1 1/2"									
200	200A	1	4#3/0		1#6	(1) - 2"									

NOTES

1. Feeder schedule is based on 75 degrees C. copper conductors. Conduit fill capacity is based on 2014 NEC table C1. Conductor sizes are based on 2014 NEC table 310-16. Ground conductor sizes are based on 2014 NEC table 250-122.

2. Omit neutral for balanced three phase loads.

MOUNTING:	SURFAC	Œ		VOL	TAGE:	480/2	77				PH	I-GRD VOL	TAGE:	E: 277 ACCESSORIES:					-
MCB OR MLO:	MCB			Pl	HASE:	3					F	PH-PH VOL	TAGE:	480			ACCES	SSORIES:	-
MCB FRAME SIZE:	250		В	US MATE	ERIAL:	CU					SOUR	CE EQUIPI	MENT:	-			ACCES	SSORIES:	-
MCB TRIP AMPS:	200			BUS RA	ATING:	250					SOL	IRCE LOCA	ATION:	-			ACCES	SSORIES:	-
MCB MAX KVA RATING:	133		AV	AILABLE	KAIC:	-					P/	ANEL LOCA	ATION:	-			SSORIES:	-	
SPARE KVA:	98		SPA	RE PER	CENT:	73%													
LOAD DESCRIPTION	CONDUIT SIZE (INCHES)	COND TYPE	(NO. WIRE) SIZE	EGC SIZE	WIRE INSUL TYPE	KAIC	CB AMPS/POL ES	POLE#	LOAD AMPS	LOAD AMPS	POLE#	CB AMPS/POL ES	KAIC	WIRE INSUL TYPE	EGC SIZE	(NO. WIRE) SIZE	COND TYPE	CONDUIT SIZE (INCHES)	LOAD DESCRIPTION
								1	36.0	4.8	2								
PANEL LP-1 VIA XFMR T1	1"	EMT	3 #6	1 #10	THWN		50	3	36.0	4.8	4	15		THWN	3 #12	1 #12	EMT	3/4"	EF-1 EXHAUST FAN (3 HP)
								5	36.0	4.8	6								
TUNNEL LIGHTING	3/4"	EMT	2 #10	1 #10	THWN		20	7	6.0	0.0	8	20							SPARE
TUNNEL LIGHTING	3/4"	EMT	2 #10	1 #10	THWN		20	9	6.0	0.0	10	20							SPARE
TUNNEL LIGHTING	3/4"	EMT	2 #10	1 #10	THWN		20	11	6.0	0.0	12	20							SPARE
TUNNEL LIGHTING	3/4"	EMT	2 #10	1 #10	THWN		20	13	6.0	0.0	14	20							SPARE
TUNNEL LIGHTING	3/4"	EMT	2 #10	1 #10	THWN		20	15	6.0	0.0	16	20							SPARE
TUNNEL LIGHTING	3/4"	EMT	2 #10	1 #10	THWN		20	17	6.0	0.0	18	20							SPARE
EM LIGHTING INVERTER	3/4"	EMT	2 #10	1 #10	THWN		20	19	3.6	0.0	20	20							SPARE
SPARE							20	21	0.0	0.0	22	20							SPARE
SPARE							20	23	0.0	0.0	24	20							SPARE
SPACE								25	0.0	0.0	26								SPACE
SPACE								27	0.0	0.0	28								SPACE
SPACE								29	0.0	0.0	30								SPACE
SPACE								31	0.0	0.0	32								SPACE
SPACE								33	0.0	0.0	34								SPACE
SPACE								35	0.0	0.0	36								SPACE
SPACE								37	0.0	0.0	38								SPACE
SPACE								39	0.0	0.0	40								SPACE
SPACE								41	0.0	0.0	42								SPACE
								LOA	D SUMM	IARY PAI	NEL:								
LOAD CATEGORIES	CONNECT	ΓΕD KVA	ÞEMAND	FACTO	DEMAN	ID KVA	TOTAL CO	ONNECT	ED KVA	TOTAL (CONNEC	TED AMPS	DEMA	ND KVA	DEMAND	FACTO	CONNE	CTED KVA	LOAD CATEGORIES
LIGHTING	11.	0	10	0%	11	.0		44.9			54.0			.6	90)%		4.0	MOTOR LOADS
RECEPTACLES (1ST 10KVA)	0.0)	10	0%	0.	.0	TOTAL	DEMAND	KVA	TOTA	L DEMAN	ID AMPS	0	.0	80)%		0.0	HVAC
RECEPTACLES (BALANCE)	0.0		50	1%	0.	.0		35.5			42.7		20	0.9	70)%		29.9	MISCELLANEOUS
A-PHASE KVA	15.			PAN	EL SIZIN	G = TOT	AL DEMANI	O KVA X	CONTIN	UOUS L	OAD FAC	CTOR X FL			TOR			56.4	A-PHASE AMPS
B-PHASE KVA	14.		CONTIN		OAD FAC		1.25					55.5	KVA					52.8	B-PHASE AMPS
C-PHASE KVA	14.				OAD FAC					66.7 AMPS					52.8	C-PHASE AMPS			

NEW PANEL 'HP-1'

MONTGOMERY COUNTY
DEPARTMENT OF TRANSPORTATION
GAITHERSBURG, MARYLAND

RECOMMENDED FOR APPROVAL

Chief, Transportation Planning and Design Section
Date
APPROVED

Chief, Division of Transportation Engineering

Designed by: <u>EMK</u> Drawn by: <u>AGT</u>

ONE LINE DIAGRAM AND PANEL SCHEDULES

CAPITAL CRESCENT TRAIL UNDER MD 355 BETHESDA, MARYLAND

SCALE : NOT TO SCALE

Project No. : <u>501316</u>

Checked by: <u>IHK</u>

FEBRUARY 2020 SHEET <u>149</u> of <u>169</u>

E-501



-018\CADD\pEL-P502_31951018.dgn	0 - 3:15 PM
N: \31951-018\C	

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 28792 EXPIRATION DATE: 6-10-2021



MOUNTING: SURFACE

CONDUIT

SIZE

(INCHES)

3/4"

3/4"

0.0

5.5

0.0

7.8

7.8

8.6

MCB OR MLO: MCB

SPARE KVA: 10

MCB FRAME SIZE: 100

MCB MAX KVA RATING: 29

LOAD DESCRIPTION

PANEL LP-2

CU-1 / DSS-1

ESS RECEPT

DTS RECEPT

SPARE

SPARE

SPARE

SPACE

SPACE

SPACE SPACE

SPACE

SPACE

LIGHTING

A-PHASE KVA

B-PHASE KVA

C-PHASE KVA

LOAD CATEGORIES

RECEPTACLES (1ST 10KVA)

RECEPTACLES (BALANCE)

STANDPIPE RECEPT

TELECOMM RECEPTS

TELECOMM RECEPTS

ELECTRICAL RM RECEPTS

CONVENIENCE RECEPTS

MCB TRIP AMPS: 100

				MONTGOMERY COUNTY DEPARTMENT OF TRANSPO GAITHERSBURG, MARYLA	RTATION	
				RECOMMENDED FOR APPROVAL		
				Chief, Transportation Planning and Design Section APPROVED	Date	-
				Chief, Division of Transportation Engineering	Date	- s
NO.	REVISION	DATE	BY	Designed by: Drown by:	Checked by:	_

PANEL SCHEDULES

CAPITAL CRESCENT TRAIL UNDER MD 355

BETHESDA,	MARYLAND
SCALE :	FEBRUARY 2020
Project No. : <u>501316</u>	SHEET <u>150</u> of <u>169</u>

E-502

								NE	W PAN	IEL 'LI	P-2'								
MOUNTING:	SURFAC	Œ		VOL	TAGE:	208/1	20				PH	I-GRD VOL	TAGE:	120			ACCE	SSORIES:	-
MCB OR MLO:	MCB			Pl	HASE:	3					F	PH-PH VOL	TAGE:	208			ACCE	SSORIES:	-
MCB FRAME SIZE:	100		В	US MATE	ERIAL:	CU					SOUR	CE EQUIPI	MENT:	-			ACCE:	SSORIES:	-
MCB TRIP AMPS:	50			BUS RA	TING:	100					SOU	RCE LOCA	TION:	-			ACCE:	SSORIES:	-
MCB MAX KVA RATING:	14		AV	AILABLE	KAIC:	-					P/	NEL LOCA	TION:	-			ACCE:	SSORIES:	-
SPARE KVA:	6		SPA	RE PERO	CENT:	43%													
LOAD DESCRIPTION	CONDUIT SIZE (INCHES)	COND TYPE	(NO. WIRE) SIZE	EGC SIZE	WIRE INSUL TYPE	KAIC	CB AMPS/POL ES	POLE#	LOAD AMPS	LOAD AMPS	POLE#	CB AMPS/POL ES	KAIC	WIRE INSUL TYPE	EGC SIZE	(NO. WIRE) SIZE	COND TYPE	CONDUIT SIZE (INCHES)	LOAD DESCRIPTION
SUMP PUMPS	3/4"	EMT	2#12	1#12	THWN	•	30	1	20.0	3.0	2	20		THWN	1 #12	2 #12	EMT	3/4"	CONVENIENCE RECEPT
SECURITY GRILLE	3/4"	EMT	2 #12	1 #12	THWN		20	3	9.8	3.0	4	20		THWN	1 #12	2 #12	EMT	3/4"	CONVENIENCE RECEPT
SPARE							20	5	0.0	1.5	6	20		THWN	1 #12	2 #12	EMT	3/4"	SUMP ROOM RECEPT
SPARE							20	7	0.0	3.5	8	20		THWN	1 #12	2 #12	EMT	3/4"	ESS ENCLOSURE 5
SPARE							20	9	0.0	3.5	10	20		THWN	1 #12	2 #12	EMT	3/4"	ESS ENCLOSURE 6
SPARE							20	11	0.0	3.5	12	20		THWN	1 #12	2 #12	EMT	3/4"	ESS ENCLOSURE 7
SPACE								13	0.0	3.5	14	20		THWN	1 #12	2 #12	EMT	3/4"	ESS ENCLOSURE 8
SPACE								15	0.0	24.0	16	30		THWN	1 #10	2 #10	EMT	3/4"	STANDPIPE RECEPT
SPACE								17	0.0	0.0	18	20							SPARE
SPACE								19	0.0	0.0	20								SPACE
SPACE								21	0.0	0.0	22								SPACE
SPACE								23	0.0	0.0	24								SPACE
									AD SUMM										
LOAD CATEGORIES	CONNECT						TOTAL CO		ED KVA	TOTAL C		TED AMPS						CTED KVA	LOAD CATEGORIES
LIGHTING	0.0			0%	0.					_	25.1	_		.2	90			3.6	MOTOR LOADS
RECEPTACLES (1ST 10KVA)				0%		.8 TOTAL DEMAND KVA			KVA	TOTA	L DEMAN	ID AMPS		.0	80			0.0	HVAC
RECEPTACLES (BALANCE)	0.0		50		0.			8.2			22.7			1.2 70%		<u>%</u>	1.7		MISCELLANEOUS
A-PHASE KVA	3.6					G = TOTAL DEMAND KVA X CONTINU				UOUS L	OAD FAC			JRE LOAD FACTOR				30.0	A-PHASE AMPS
B-PHASE KVA	4.8				OAD FAC		1.25					12.8	KVA					10.3	B-PHASE AMPS
C-PHASE KVA	0.6	3	Fl	JTURE L	OAD FAC	CTOR:	1.25					35.5	AMPS					5.0	C-PHASE AMPS

NEW PANEL 'LP-1'

KAIC AMPS/POL POLE# LOAD LOAD AMPS POLE# AMPS/POL KAIC INSUL

1 | 26.0 | 8.3 | 2

3 26.0 12.5 4

5 26.0 9.8 6

7 | 16.0 | 3.5 | 8

11 | 24.0 | 3.5 | 12

13 | 4.0 | 4.0 | 14

15 4.0 0.0 16

17 4.0 0.0 18

19 3.0 0.0 20

21 3.0 0.0 22

23 4.0 0.0 24

25 0.0 0.0 26

27 0.0 0.0 28

29 0.0 0.0 30

31 | 0.0 | 0.0 | 32

33 0.0 0.0 34 35 0.0 0.0 36

37 0.0 0.0 38

39 0.0 0.0 40

41 0.0 0.0 42 LOAD SUMMARY PANEL:

TOTAL DEMAND KVA TOTAL DEMAND AMPS

PANEL SIZING = TOTAL DEMAND KVA X CONTINUOUS LOAD FACTOR X FUTURE LOAD FACTOR

9 16.0 3.5

30

20

20

20

20

20

20

20

20

1.25

24.1

VOLTAGE: 208/120

PHASE:

BUS MATERIAL: CU

SPARE PERCENT: 33%

AVAILABLE KAIC:

EGC

3 #4 | 1 #4 | THWN

WIRE) SIZE

EMT | 2 #12 | 1 #12 | THWN |

EMT 2#6 1#6 THWN

EMT 2 #10 | 1 #10 | THWN |

EMT 2 #10 1 #10 THWN

EMT 2 #10 1 #10 THWN

EMT 2 #10 1 #10 THWN

EMT | 2 #10 | 1 #10 | THWN

EMT 2 #10 | 1 #10 | THWN

100%

100%

50%

CONTINUOUS LOAD FACTOR:

0.0

5.5

0.0

FUTURE LOAD FACTOR: 1.25

(NO.

SIZE

COND

TYPE

EMT

BUS RATING: 100

WIRE

INSUL

TYPE

PH-GRD VOLTAGE: 120

PH-PH VOLTAGE:

SOURCE EQUIPMENT:

CB

20

20

20

20

20

20

20

20

20

20

20

10

CONNECTED KVADEMAND FACTOR DEMAND KVA TOTAL CONNECTED KVA TOTAL CONNECTED AMPS DEMAND KVA DEMAND FACTOR CONNECTED KVA LOAD CATEGORIES

67.0

53.2

SOURCE LOCATION:

PANEL LOCATION:

ACCESSORIES:

ACCESSORIES:

ACCESSORIES:

ACCESSORIES:

ACCESSORIES:

COND

TYPE

CONDUIT

SIZE

(INCHES)

3/4"

3/4"

3/4"

1.2

3.8

13.6

64.8

65.0

71.3

LOAD DESCRIPTION

HEAT TRACE

HEAT TRACE

ESS RECEPT

SPARE

SPARE

SPARE

SPARE

SPARE

SPACE

SPACE

SPACE

SPACE

SPACE

SPACE

SPACE

SPACE

SPACE

HVAC

MOTOR LOADS

A-PHASE AMPS

B-PHASE AMPS

C-PHASE AMPS

MISCELLANEOUS

SECURITY GRILLE

ESS ENCLOSURES 1

ESS ENCLOSURES 2 ESS ENCLOSURES 3

(NO.

WIRE)

SIZE

THWN 1#6 2#6 EMT 3/4"

THWN | 1 #10 | 2 #12 | EMT | 3/4"

THWN 1 #10 2 #12 EMT 3/4"

THWN | 1 #8 | 2 #8 | EMT |

THWN | 1 #8 | 2 #8 | EMT |

THWN | 1 #10 | 2 #12 | EMT |

THWN | 1 #10 | 2 #12 | EMT |

90%

80%

70%

3.1

9.5

30.0 KVA

83.1 AMPS

EGC

SIZE

TYPE

	LIGHTING FIXTURE TYPE SCHEDULE									
FIX.	DESCRIPTION	MOUNTING	L	AMPS	MANUFACTURER AND CATALOG NUMBER					
TYPE	DESCRIPTION	MOONTING	VOLT	TYPE	IVIANOI ACTONEN AND CATALOG INDIVIBLIT					
A	LED LINEAR WALL WASH FIXTURE. 4' LENGTH. ANDJUSTABLE MOUNTING BRACKETS. 4000K CCT. IP66 RATED.	SURFACE	277	4000K LED	ECOSENSE L50-E-48"-04-40-80-MULT-25X75					
B	LED INDUSTRIAL FIXTURE. 6000 LM NOMINAL OUTPUT. 4000K CCT. WET LOCATION LISTED.	SURFACE	277	4000K LED	LITHONIA VAP-6000LM-FST-MD-MVOLT-GZ10-40K-80CRI					
\triangle	LED ALUMINUM EXIT SIGN. DAMP LOCATION LISTING.	WALL	277	LED	LITHONIA TLE-2-R-EL-N					



			MONTGOMERY COUNTY DEPARTMENT OF TRANSPOR GAITHERSBURG, MARYLA	RTATION	LIGHTIN
			RECOMMENDED FOR APPROVAL] Capit <i>a</i>
			Chief, Transportation Planning and Design Section APPROVED	Date	U BETH
			Chief, Division of Transportation Engineering	Date	SCALE : NOT TO SCAL
REVISION	DATE	BY	Designed by: <u>EMK</u> Drawn by: <u>AGT</u>	Checked by:IHK	Project No. : <u>501316</u>

LIGHTING FIXTURE SCHEDULE

CAPITAL CRESCENT TRAIL UNDER MD 355 BETHESDA, MARYLAND

SCALE : NOT TO SCALE

FEBRUARY 2020 SHEET <u>151</u> of <u>169</u>

E-701

ABBREVIATIONS

A AC ACS AFG AFF AHU	AMPERES ALTERNATING CURRENT ACCESS CONTRL SYSTEM ABOVE FINISHED GRADE ABOVE FINISHED FLOOR AIR HANDLING UNIT	MCB MCC MH MIN MLO MOD	MAIN CIRCUIT BREAKER MOTOR CONTROL CENTER MOUNTING HEIGHT MINIMUM MAIN LUGS ONLY MOTOR OPERATED DAMPER
AWG BLDG	AMERICAN WIRE GUAGE BUILDING	MOV MTD MTG	MOTOR OPERATED DAMPER MOUNTED MOUNTING
BKR	BREAKER	N I	NEUTDAL
C CB CCTV	CONDUIT CIRCUIT BREAKER CLOSED CIRCUIT TELEVISION	N NEC NEMA	NEUTRAL NATIONAL ELECTRICAL CODE NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION
DC DN DWH	DIRECT CURRENT DOWN DOMESTIC WATER HEATER	NFSS NIC NTS	NON FUSED SAFETY SWITCH NOT IN CONTRACT NOT TO SCALE
EA	EACH	Р	POLE
EBH	ELECTRIC BASEBOARD HEATER	PB PH	PUSH BUTTON PHASE
EF EH ELECT	EXHAUST FAN ELECTRIC HEATER ELECTRICAL	PL PLC PNL	PILOT LIGHT PROGRAMMABLE LOGIC CONTROLLE PANELBOARD
ELEV EMERG. EMT EQUIP	ELEVATION EMERGENCY ELECTRICAL METALLIC TUBING EQUIPMENT	PT PVC PWR	POTENTIAL TRANSFORMER POLYVINYL CHLORIDE POWER
ESS	ELECTRONIC SECURITY SYSTEM(S)	PH, Ø	PHASE
EWC EWH EX, EXIST	ELECTRIC WATER COOLER ELECTRIC WALL HEATER EXISTING	(R) RECEPT REQ' D	DEVICE IN NEW LOCATION RECEPTACLE REQUIRED
FA FA FAAP	FRAME AMPS FIRE ALARM FIRE ALARM ANNUNCIATOR PANEL	RGS RMS	RIGID GALVANIZED STEEL ROOT MEAN SQUARE
FACP FCU	FIRE ALARM CONTROL PANEL FAN COIL UNIT	STOR SW	STORAGE SWITCH
FDR	FEEDER	SWBD	SWITCHBOARD
FIXT FL FLEX	FIXTURE FLOOR FLEXIBLE	SWGR SYMM SYS	SWITCHGEAR SYMMETRICAL SYSTEM
FMC FS FSS	FLEXIBLE METAL CONDUIT FLOW SWITCH FUSED SAFETY SWITCH	TA TYP	TRIP AMPS TYPICAL
G GFI	GROUND GROUND FAULT INTERRUPTER	UH UG UON	UNIT HEATER UNDERGROUND UNLESS OTHERWISE NOTED
HP HPS HTR	HORSEPOWER HIGH PRESSURE SODIUM HEATER	V VFD	VOLTS OR VOLTAGE VARIABLE FREQUENCY DRIVE
IDS	INTRUSION DETECTION SYSTEM	W	WATTS
JB	JUNCTION BOX	W	WIRE
KAIC KV	THOUSAND AMPERES INTERRUPTING CAPACITY KILOVOLT	W/ WP	WITH WEATHERPROOF
KVA	KILOVOLT AMPERE	XFMR	TRANSFORMER
LTG	LIGHTING		

LEGEND

POWER SUPPLY

JUNCTION BOX

EMERGENCY TELEPHONE

REX

T–XX

DOOR CONTACT BACK BOX CARD READER ELECTRONIC SECURITY SYSTEM ENCLOSURE C-XX CCTV CAMERA POE CCTV CAMERA POE SWITCH ELECTRIC DOOR STRIKE INTRUSION DETECTION KEYPAD

REQUEST TO EXIT MOTION DETECTOR

GENERAL SHEET NOTES

- COORDINATE AND CONFIRM WITH CUSTOMERS SECURITY REPRESENTIVE FINAL LOCATION OF ALL ESS DEVICES PRIOR TO INSTALLATION OF INFRASTRUCTURE.
- 2. PROVIDE PULL STRINGS IN ALL EMPTY CONDUITS TO FACILITATE PULLING OF CABLES.
- CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE THE INSTALLATION OF CONDUIT(S) WITH **EXISTING CONDITIONS.**
- 4. PROVIDE AT A MINIMUM A 12 INCH BEND RADIUS IN ALL CONDUITS.
- ALL CONDUIT SHALL BE ROUTED ABOVE CEILINGS, BELOW FLOORS OR WITHIN WALLS UNLESS OTHERWISE NOTED.
- ALL ENCLOSURES/JUNCTION BOXES SHALL BE SURFACE MOUNTED ABOVE THE CEILING UNLESS
- 7. ALL ENCLOSURES/JUNCTION BOXES MOUNTED WITHIN FIRE RATED PARTITIONS SHALL MEET THE FIRE RATING OF THE PARTITION AS REQUIRED BY CODE.
- 8. PROVIDE CONDUIT BUSHINGS IN EACH ENCLOSURES/JUNCTION BOX.
- ALL ENCLOSURES/JUNCTION AND PULL BOXES SHALL BE PROVIDED WITH COVER PLATES, BACK MOUNTING PANELS AND LOCKING MECHANISMS.
- CONDUIT ROUTING, BACKBOX, AND JUNCTION/PULL BOX LOCATIONS SHALL BE FIELD VERIFIED AND COORDINATED WITH OTHER DISCIPLINES BY THE CONTRACTOR.
- 11. ELECTRONIC SECURITY SYSTEMS (ESS) DEVICES AND EQUIPMENT SHOWN WITH BE FURNISHED AND INSTALLED BY EAI. CONTRACTOR IS RÉSPONSIBLE FOR PROVIDING ALL INFRASTRUCTURE TO CONNECT EACH DEVICE SHOWN. COMMUNICATIONS CABLING TO THESES DEVICES IS ALSO PROVIDED BY EAI.
- 12. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE AND ALL APPLICABLE LOCAL CODES.
- 13. PROVIDE 3/4" CONDUIT UNLESS OTHERWISE NOTED.
- 14. LABEL SECURITY CONDUITS AND TERMINATION BOXES.
- 15. PROVIDE PULL BOXES AFTER THE USE OF (2) 90 DEGREE BENDS.
- 16. DEVICE LAYOUT DEPICTED IN THESE DRAWINGS ARE BASELINE. MODIFICATION TO INFRASTRUCTURE MAY BE NECESSARY DUE TO DOOR OR WALL CONSTRUCTION.
- 17. SEE TELECOMMUNICATIONS SHEETS FOR NETWORK CONNECTIVITY.
- BEFORE CORE DRILLING ANY FLOOR SLAB OR WALL PENETRATION, CONFIRM THE ABSENCE OF REINFORCING. STEEL BY DRILLING A 1/4 DIAMETER PILOT HOLE FOR EACH CONDUIT OR BY OTHER NONDESTRUCTIVE METHODS. DO NOT CUT OR DRILL THROUGH REINFORCING STEEL WITHOUT THE APPROVAL OF THE PROJECT MANAGER. PROVIDE FIRESTOPPING IN ANULAR SPACE IN ALL NEW PENETRATIONS REQUIRED FOR CONDUITS.
- 19. ALL EXISTING TO REMAIN STRUCTURES, PAVEMENTS, EQUIPMENT AND UTILITIES SHALL BE PROTECTED AGAINST DAMAGE AND IF DAMAGED SHALL BE RESTORED TO ORIGINAL CONDITION BY THE CONTRACTOR AT NO COST TO THE OWNER.
- 20. NOTE THAT ALL SYMBOLS MAY NOT BE USED.
- 21. CONTRACTOR SHALL VERIFY ALL FIELD CONDITIONS BEFORE STARTING WORK.

TY-001

PROFESSIONAL CERTIFICATION. HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO.___ EXPIRATION DATE:_



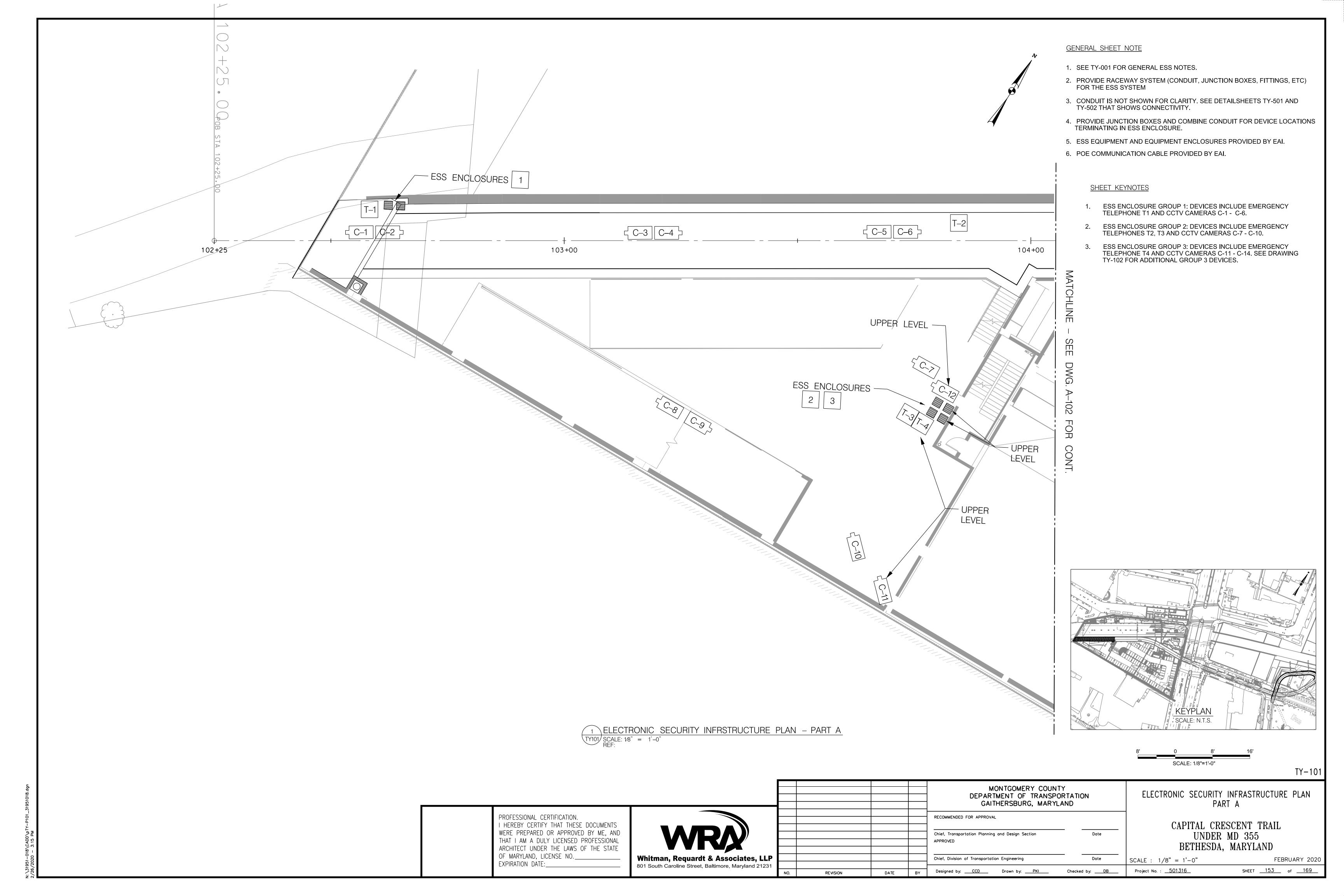
			MONTGOMERY COUN' DEPARTMENT OF TRANSPO GAITHERSBURG, MARYL	ORTATION
			RECOMMENDED FOR APPROVAL	
			Chief, Transportation Planning and Design Section APPROVED	Date
			Chief, Division of Transportation Engineering	Date
REVISION	DATE	BY	Designed by: <u>CCD</u> Drawn by: <u>PKI</u>	Checked by: DB

ELECTRONIC SECURITY INFRASTRUCTURE PLAN NOTES, SYMBOLS AND ABBREVIATIONS

> CAPITAL CRESCENT TRAIL UNDER MD 355 BETHESDA, MARYLAND

SCALE : AS SHOWN Project No. : <u>501316</u>

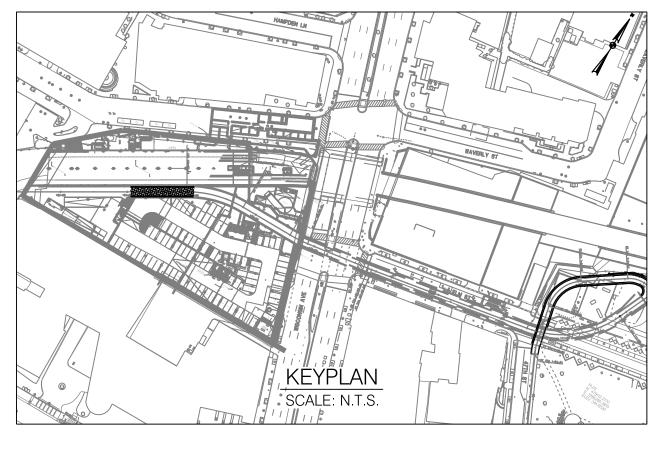
FEBRUARY 2020 SHEET <u>152</u> of <u>169</u>



 C−15 | C−16 |

 C-13 C14 101 1 ELECTRONIC SECURITY INFRASTRUCTURE PLAN – PART B TY102 SCALE: 1/8" = 1'-0" REF: GENERAL SHEET NOTES

- 1. SEE TY-001 FOR GENERAL ESS NOTES.
- 2. PROVIDE RACEWAY SYSTEM (CONDUIT, JUNCTION BOXES, FITTING, ETC)., FOR THE ESS SYSTEM.
- 3. CONDUIT IS NOT SHOWN FOR CLARITY. SEE DETAIL SHEETS TY-501 AND TY-502 THAT SHOWS CONNECTIVITY.
- 4. PROVIDE JUNCTION BOXES AND COMBINE CONDUIT FOR CCTV CAMERA LOCATIONS TERMINATING IN ESS ENCLOSURE.
- 5. ESS GROUP 3 DEVICES INCLUDES CCTV CAMERA C-13 AND C-14.
- 6. ESS GROUP 4 DEVICES INCLUDE EMERGENCY TELEPHONE T5 AND CCTV CAMERAS C-15 AND C-16.
- PROVIDE JUNCTION BOXES AND COMBINE CONDUIT FOR GROUP 4 DEVICE LOCATIONS TERMINATING IN ESS SECURITY NETWORKING ROOM.
- 8. POE COMMUNICATION CABLE PROVIDED BY EAI.
- 9. ESS EQUIPMENT AND EQUIPMENT ENCLOSURES BY EAI.

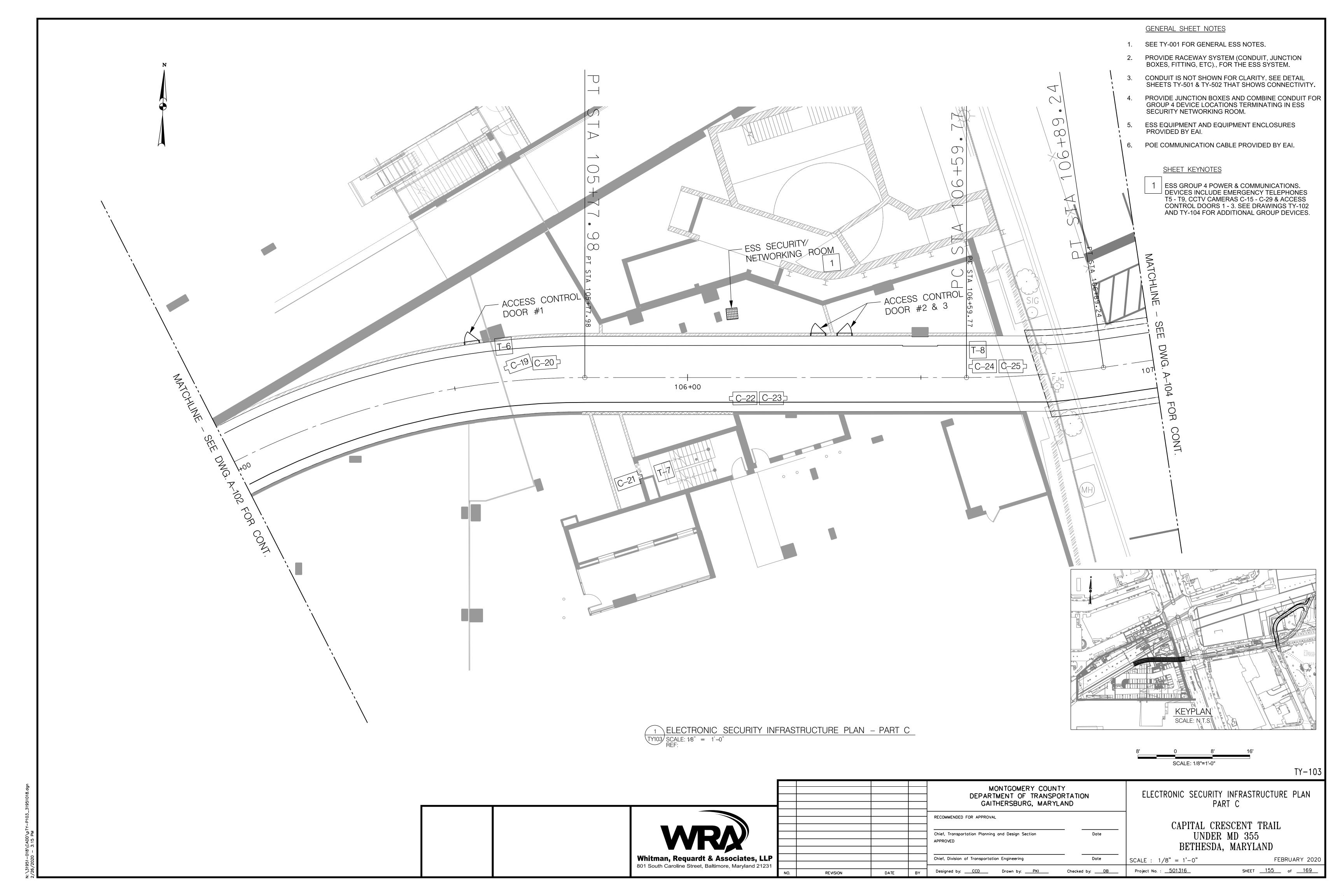


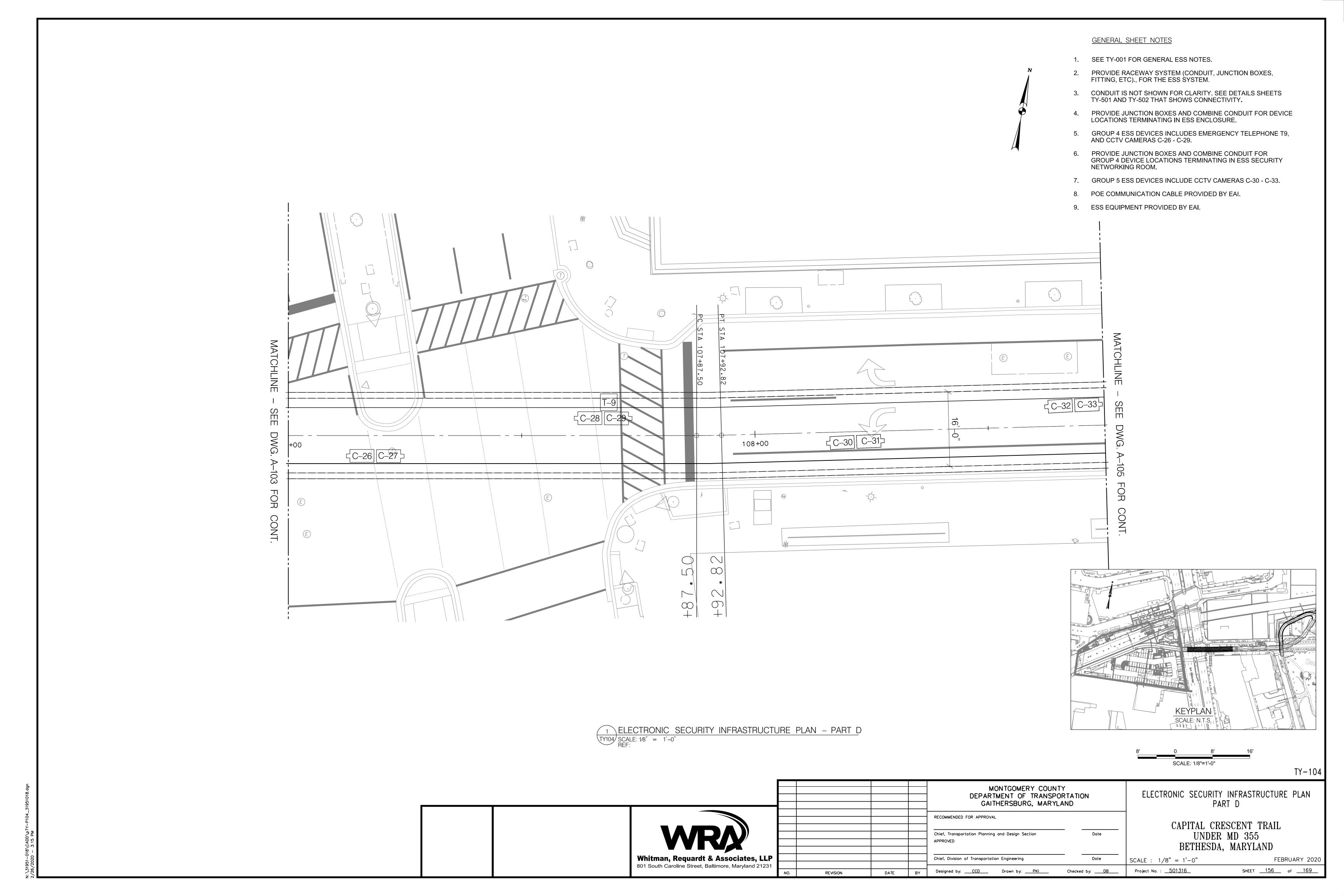
SCALE: 1/8"=1'-0"

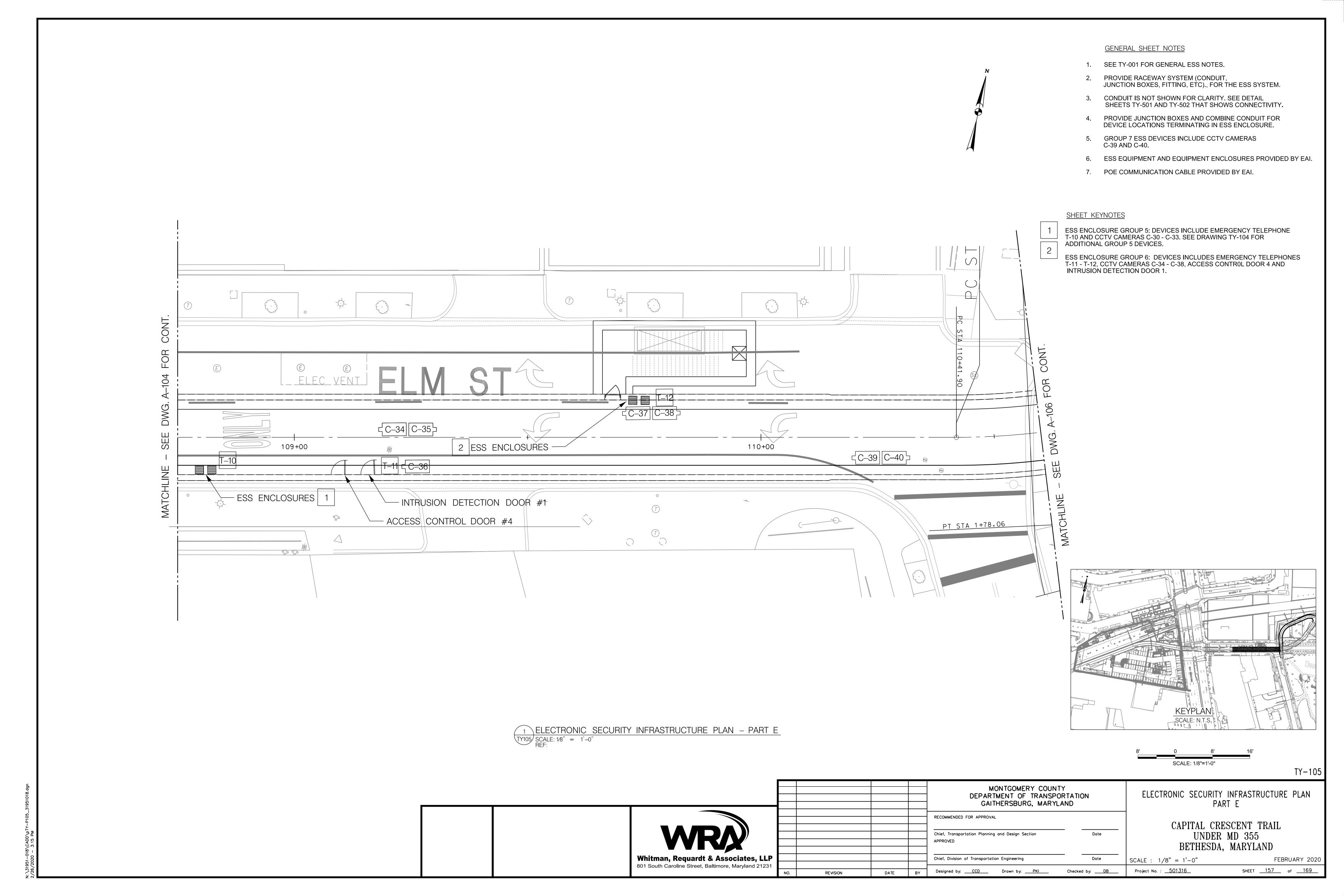
TY-102

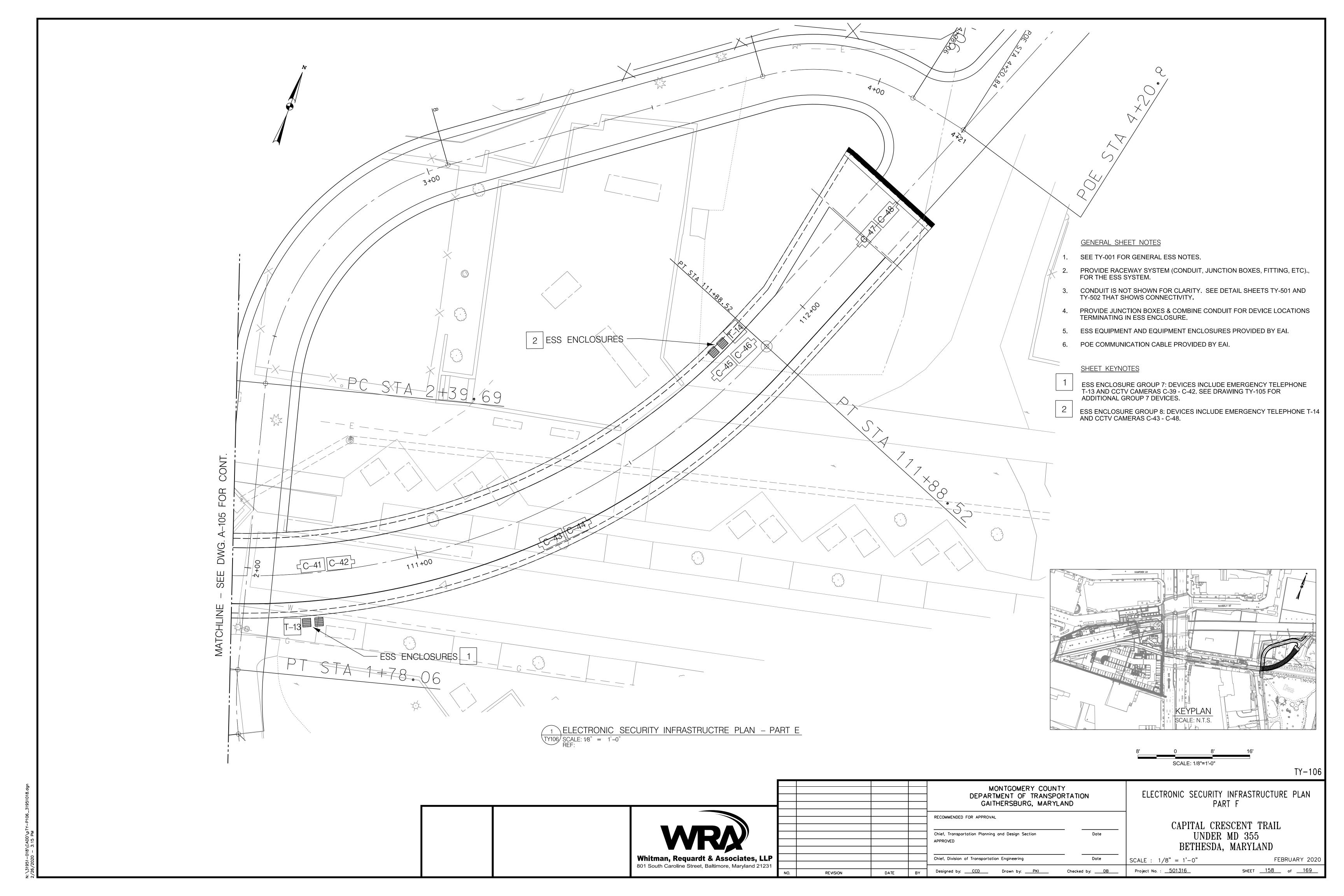
FEBRUARY 2020

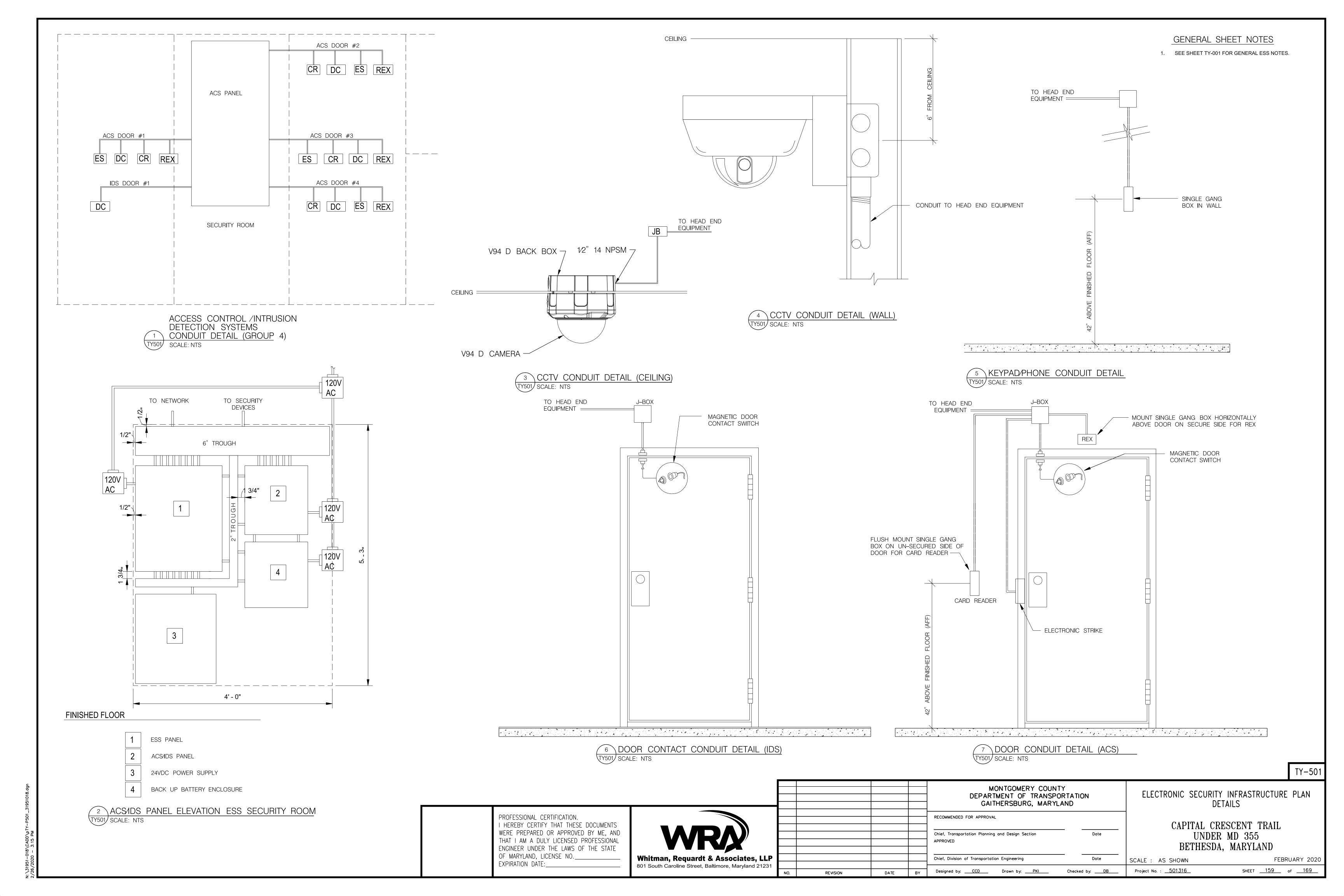
MONTGOMERY COUNTY
DEPARTMENT OF TRANSPORTATION
GAITHERSBURG, MARYLAND ELECTRONIC SECURITY INFRASTRUCTURE PLAN PART B RECOMMENDED FOR APPROVAL CAPITAL CRESCENT TRAIL UNDER MD 355 BETHESDA, MARYLAND Chief, Transportation Planning and Design Section Whitman, Requardt & Associates, LLP 801 South Caroline Street, Baltimore, Maryland 21231 Chief, Division of Transportation Engineering SCALE : 1/8" = 1'-0"Project No. : <u>501316</u> SHEET <u>154</u> of <u>169</u> Checked by: <u>DB</u>

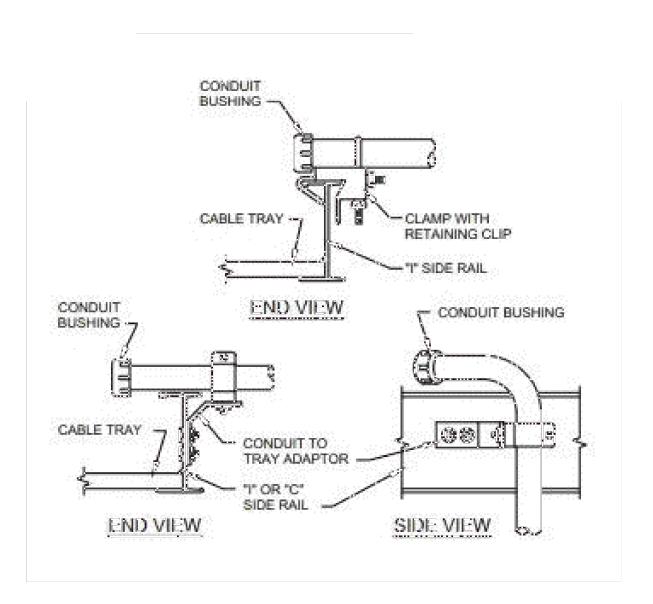




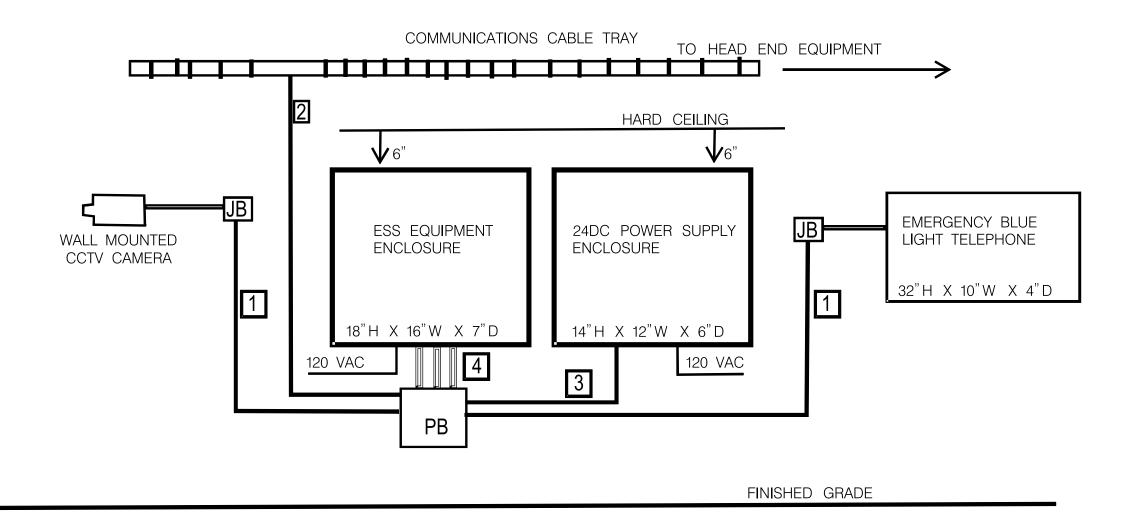




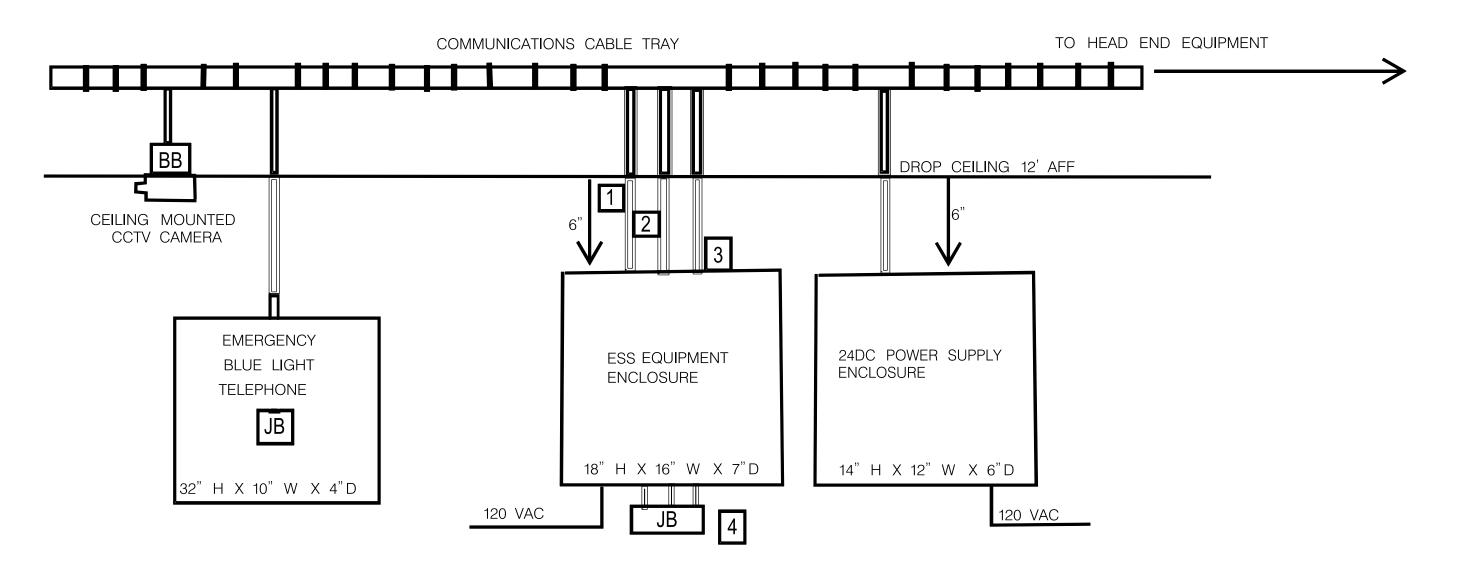




3 CONDUIT TO CABLE TRAY DETAIL TY502 SCALE: NTS



1 ESS EQUIPMENT CONDUIT DETAIL (SURFACE MOUNT TYPICAL) TY502 SCALE: NTS



2 ESS EQUIPMENT CONDUIT DETAIL (EMBEDDED TYPICAL) TY502 SCALE: NTS

TY-502

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. EXPIRATION DATE:_



				MONTGOMERY COUI DEPARTMENT OF TRANSF GAITHERSBURG, MARY
				RECOMMENDED FOR APPROVAL
				Chief, Transportation Planning and Design Section APPROVED
				Chief, Division of Transportation Engineering
NO.	REVISION	DATE	BY	Designed by: <u>CCD</u> Drawn by: <u>PKI</u>

DEPARTMENT OF TRANSPORTATION GAITHERSBURG, MARYLAND NDED FOR APPROVAL ensportation Planning and Design Section

Checked by: DB

MONTGOMERY COUNTY

ELECTRONIC SECURITY INFRASTRUCTURE PLAN DETAILS

> CAPITAL CRESCENT TRAIL UNDER MD 355 BETHESDA, MARYLAND

SCALE : AS SHOWN Project No. : <u>501316</u>

GENERAL SHEET NOTES

2. PROVIDE RACEWAY SYSTEM (CONDUIT, JUNCTION BOXES, FITTING, ETC)., FOR THE ESS SYSTEM.

3. SEE TELECOMMUNICATIONS DRAWINGS FOR FOR CABLE TRAY DETAILS.

4. ESS EQUIPMENT AND EQUIPMENT ENCLOSURES PROVIDED BY EAI.

5. CCTV CAMERA POE COMMUNICATION CABLE PROVIDED BY EAI.

1. SEE TY-001 FOR GENERAL ESS NOTES.

SHEET KEYNOTES

POWER AND COMMUNICATION CABLE. CONNECTION TO ESS GROUP EQUIPMENT.

FIBER OPTIC COMMUNICATIONS HOME

CONDUCT INLET INTO ENCLOSURE MUST BE FROM THE BOTTOM OF THE ENCLOSURE.

RUN CABLE.

24VDC POWER.

FEBRUARY 2020 SHEET <u>160</u> of <u>169</u>

LEGEND

RADIO DEVICES



DIRECTIONAL UHF DONOR ANTENNA FOR PUBLIC SAFETY RADIO SYSTEM - ARROW INDICATES DIRECTION, # INDICATE ANTENNA NUMBER.



OMNI DIRECTIONAL COVERAGE UNIT FOR CELLULAR REPATER SYSTEM - # INDICATES UNIT NUMBER.



ETHERNET POE EXTENDER FOR CELLULAR REPEATER COVERAGE UNITS - # INDICATES EXTENDER NUMBER.

CELLULAR SERVICE SIGNAL BOOSTER (VERIZON, AT&T, T-MOBILE & SPRINT).



PUBLIC SAFETY RADIO BI-DIRECTIONAL AMPLIFIER (700/800 MHZ).



WELDED WIRE BASKET TRAY 12" WIDE BY 4" DEEP. INSTALL TRAY 12" ABOVE ACCESSIBLE CEILING MEASURED FROM UNDERSIDE OF TRAY. SUPPORT TRAY USING WALL MOUNTED SUPPORTS OR TRAPEZE-STYLE SYSTEM THAT IS INDEPENDENT FROM ACCESSIBLE CEILING SUPPORT SYSTEM. SECURE TRAY TO ALL SUPPORTS. ENSURE TRAY SECTIONS ARE CONDUCTIVELY CONTINUOUS FOR GROUNDING PURPOSES. CONNECT CABLE TRAY TO TELECOMMUNICATIONS GROUND. PROVIDE A MINIMUM OF (2) SUPPORTS FOR EACH TRAY SECTION LONGER THAN 5 CONTINUOUS FEET. PLACE À SUPPORT NO MORE THAN 1-FOOT FROM ANY END TRAY SECTION. PLACE SUPPORTS ON EACH SIDE OF ADJOINING TRAY SECTIONS WITHIN 2-FEET OF CONNECTION.

1/2" 50 OHM COAXIAL ANTENNA CABLE, INSTALL IN 1-1/2" CONDUIT

ABBREVIATIONS AMPERES ALTERNATING CURRENT AFF ABOVE FINISHED FLOOR AFG ABOVE FINISHED GRADE AHU AIR HANDLING UNIT AIC AMPERES INTERRUPTING CAPACITY, (SYM, RMS AMPS) AMERICAN WIRE GAUGE AWG **BLDG** BUILDING BKR BREAKER CONDUIT CB CIRCUIT BREAKER CH CABINET HEATER CKT CIRCUIT COMB COMBINATION CLG CEILING CT **CURRENT TRANSFORMER** CU COPPER DB DECIBEL DBM DECIBEL-MILLIWATTS DWG DRAWING

ECD ELEMENTARY CONTROL DIAGRAM EF EXHAUST FAN **EQUIP EQUIPMENT ETR EXISTING TO REMAIN ETBR EXISTING TO BE REMOVED** EWH ELECTRIC WATER HEATER EX, EXIST EXISTING EXP **EXPLOSION PROOF FUSE**

FAAP FIRE ALARM ANNUNCIATOR PANEL **FACP** FIRE ALARM CONTROL PANEL FC **FAN COIL UNIT** FSS **FUSED SAFETY SWITCH** FT FOOT OR FEET GROUND GROUND FAULT INTERRUPTER

GFI HID HIGH INTENSITY DISCHARGE HH HANDHOLE HOA HAND OFF AUTOMATIC HP HORSEPOWER HPS HIGH PRESSURE SODIUM HTR HEATER HIGH VOLTAGE HV

JUNCTION BOX JB THOUSAND AMPERES INTERRUPTING KAIC

CAPACITY ΚV KILOVOLT KILOVOLT AMPERE KVA ΚW KILOWATT LTG LIGHTING

HERTZ

MCB MAIN CIRCUIT BREAKER MCCB MOLDED CASE CIRCUIT BREAKER

MH MOUNTING HEIGHT MHZ MEGAHERTZ MIN MINIMUM MAIN LUGS ONLY MLO MOD MOTOR OPERATED DAMPER MSP MOTOR STARTER PANEL

MTD MOUNTED MTG MOUNTING NEUTRAL NOTIFICATION APPLIANCE CONTROL PANEL

NATIONAL ELECTRICAL CODE NEMA NATIONAL ELECTRICAL MANUFACTURER'S

ASSOCIATION NON FUSED SAFETY SWITCH NIC NOT IN CONTRACT

NTS NOT TO SCALE OVERLOAD **PUSH BUTTON** PH PHASE PNL PANELBOARD PS PRESSURE SWITCH PRESSURE SWITCH HIGH PVC POLYVINYL CHLORIDE RECEPT RECEPTACLE

RGS RIGID GALVANIZED STEEL RMROOM RX REMOVE EXISTING S.T. SHUNT TRIP SW SWITCH SWBD SWITCHBOARD **SWGR SWITCHGEAR** SYM SYMMETRICAL SYS TRANSFORMER

SYSTEM TYP **TYPICAL** SPD SURGE PROTECTIVE DEVICE UON **UNLESS OTHERWISE NOTED**

VOLTS OR VOLTAGE VFD VARIABLE FREQUENCY DRIVE

W/ WITH

WP WEATHERPROOF **XFMR** TRANSFORMER PHASE

GENERAL NOTES

- 1. ALL ILLUSTRATED DEVICE LOCATIONS ARE APPROXIMATE AND MUST BE COORDINATED WITH EXISTING STRUCTURES AND EQUIPMENT.
- 2. CONTRACTOR IS TO PROVIDE A COMPLETE AND OPERATIONAL TWO-WAY RADIO AND CELLULAR REPEATER AND DISTRIBUTED ANTENNA SYSTEM.
- 3. SYSTEM SHALL PROVIDE A SIGNAL LEVEL OF -95 DBM OR BETTER IN 99% OF ALL AREAS.
- 4. ISOLATION BETWEEN THE DONOR ANTENNA AND ALL INSIDE ANTENNAS SHALL BE A MINIMUM OF 15 DB ABOVE THE SIGNAL BOOSTER GAIN UNDER ALL OPERATING CONDITIONS.

T-001

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 28792 EXPIRATION DATE: 6-10-2021



DI				
RECOMMENDED FOR				
Chief, Transportation				
APPROVED				
Chief, Division of Tro				
Designed by:D	BY	DATE	REVISION	١.

MONTGOMERY COUNTY DEPARTMENT OF TRANSPORTATION GAITHERSBURG, MARYLAND APPROVAL ion Planning and Design Section

Checked by: DAA

ansportation Engineering

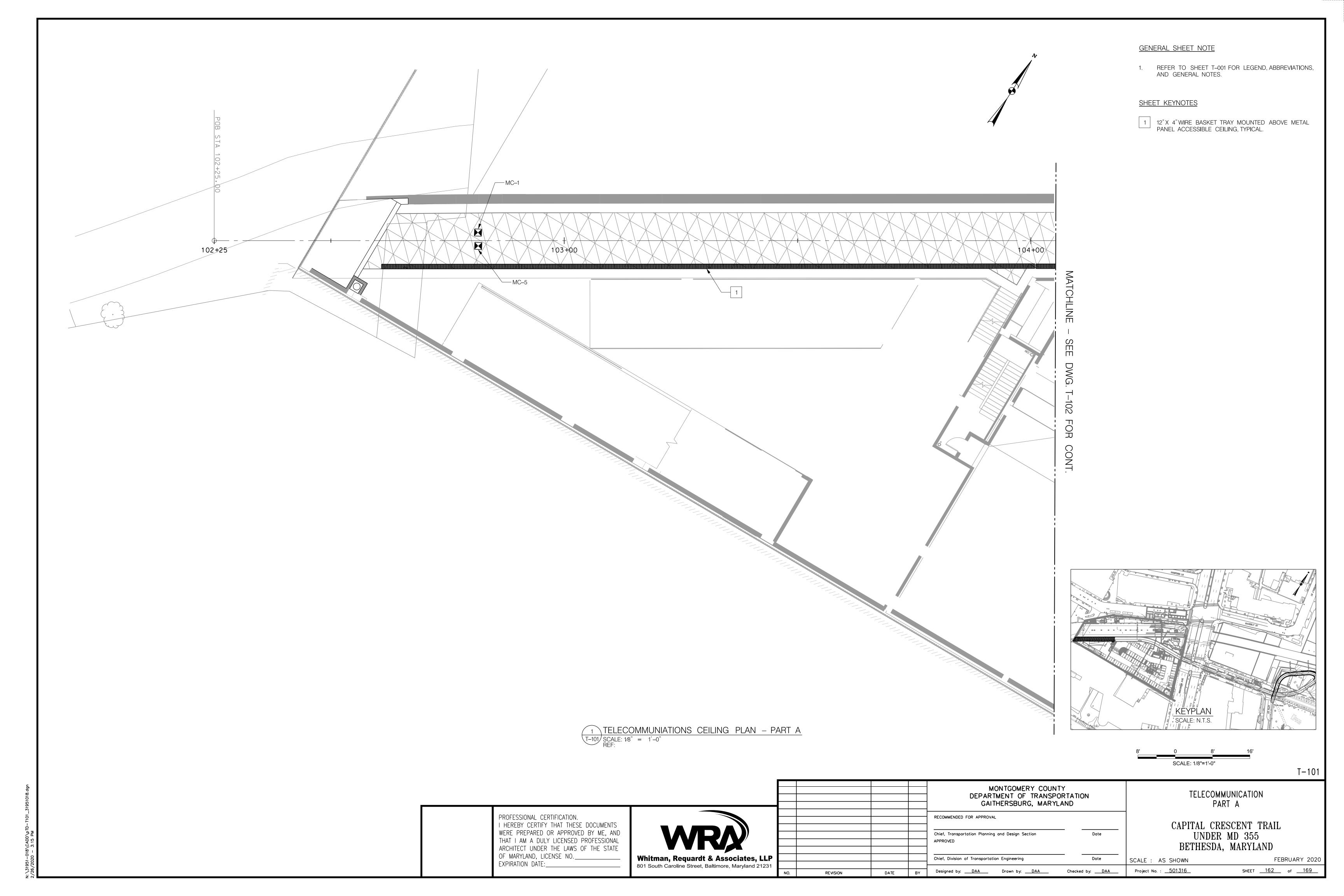
AA Drawn by: DAA

TELECOMMUNICATION NOTES, SYMBOLS AND ABBREVIATIONS

> CAPITAL CRESCENT TRAIL UNDER MD 355 BETHESDA, MARYLAND

SCALE : AS SHOWN Project No. : <u>501316</u>

FEBRUARY 2020 SHEET <u>161</u> of <u>169</u>

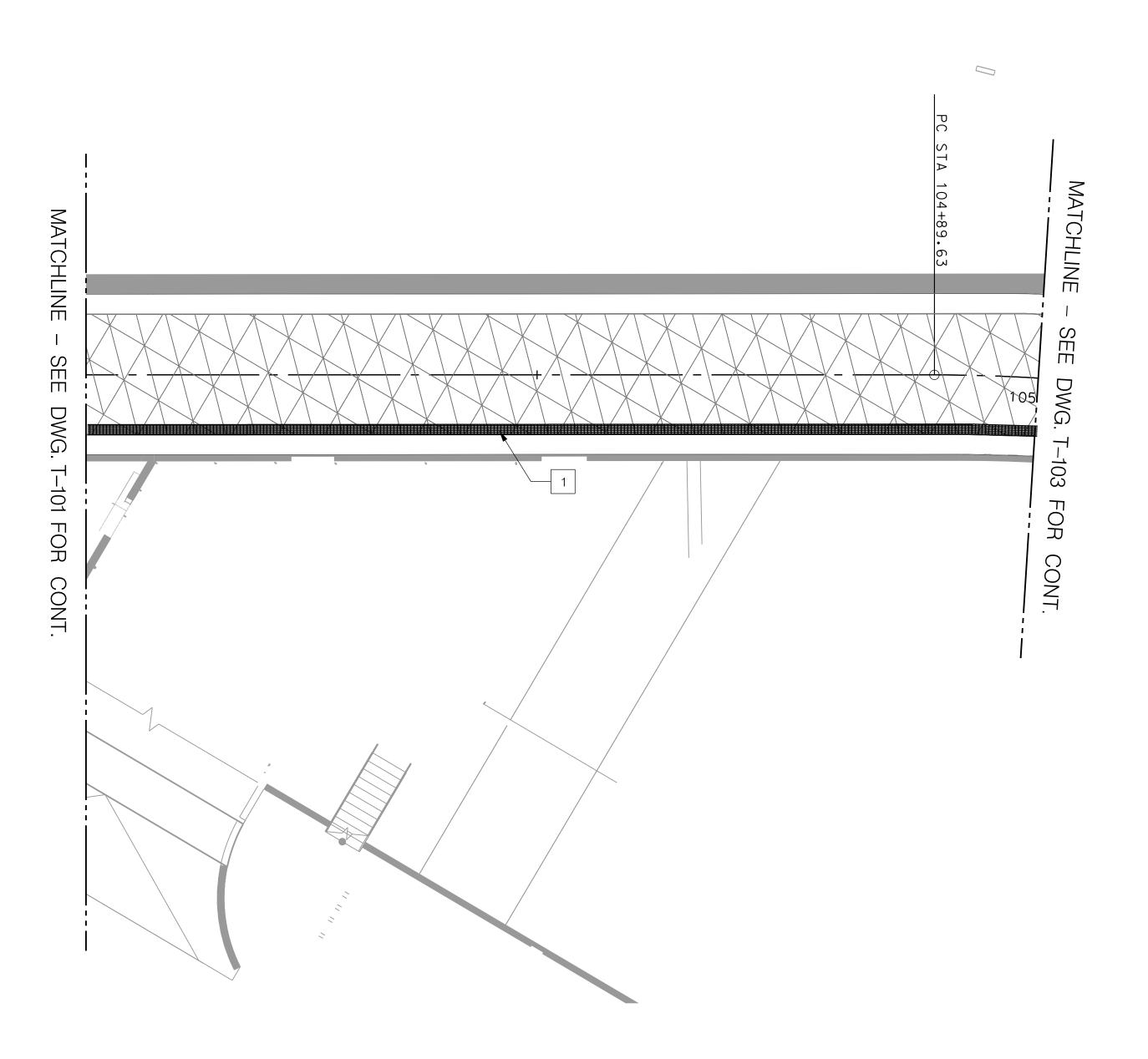


GENERAL SHEET NOTE

1. REFER TO SHEET T-001 FOR LEGEND, ABBREVIATIONS, AND GENERAL NOTES.

SHEET KEYNOTES

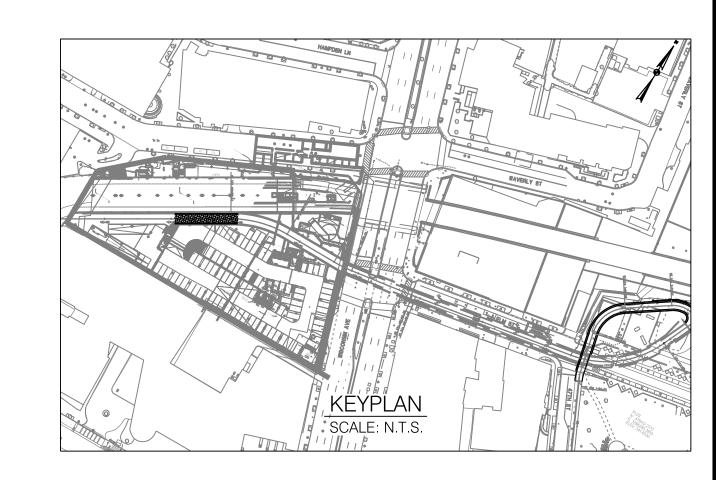
1 12"X 4" WIRE BASKET TRAY MOUNTED ABOVE METAL PANEL ACCESSIBLE CEILING, TYPICAL.



TELECOMMUNICATIONS CEILING PLAN — PART B

T-102 SCALE: 1/8" = 1'-0"

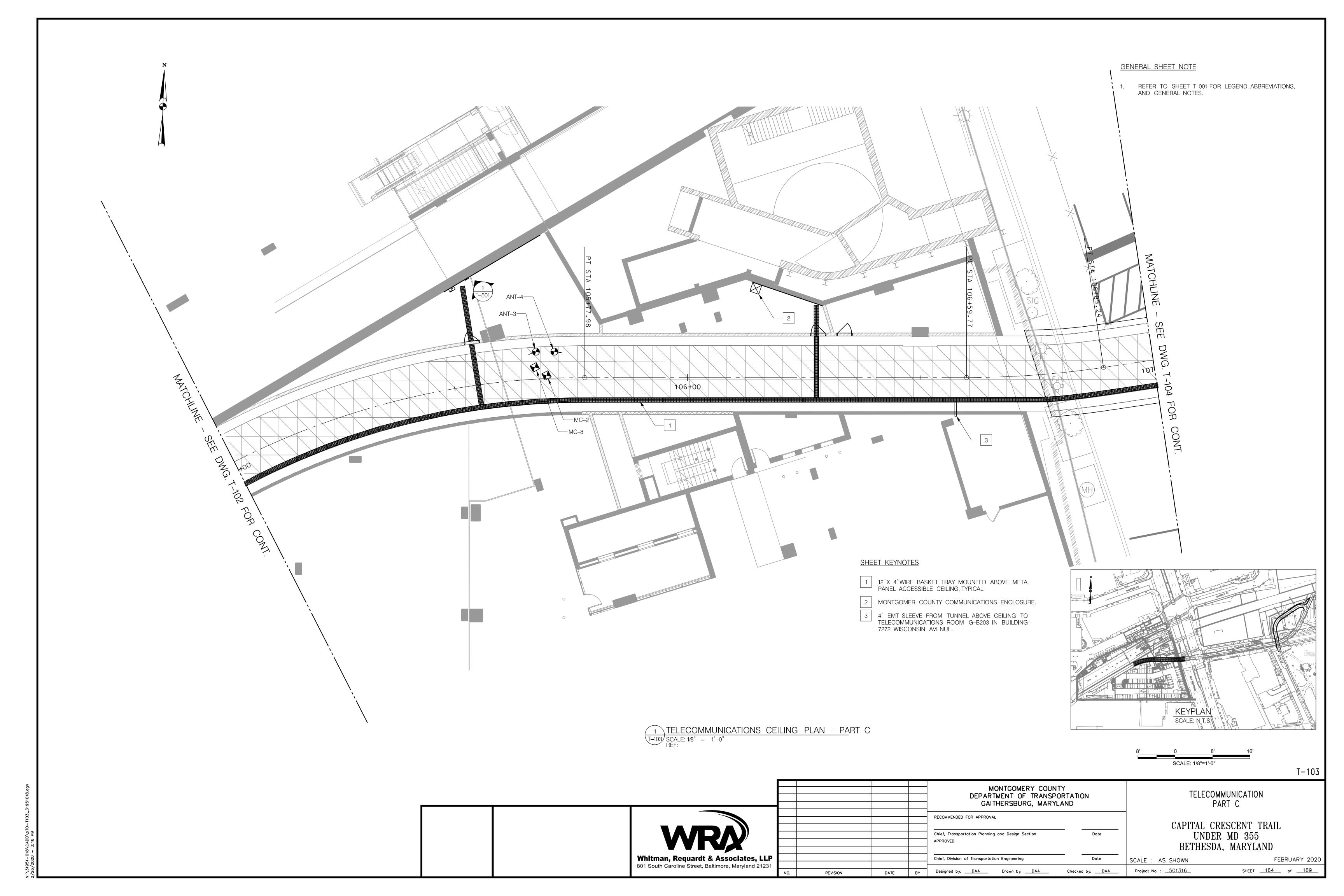
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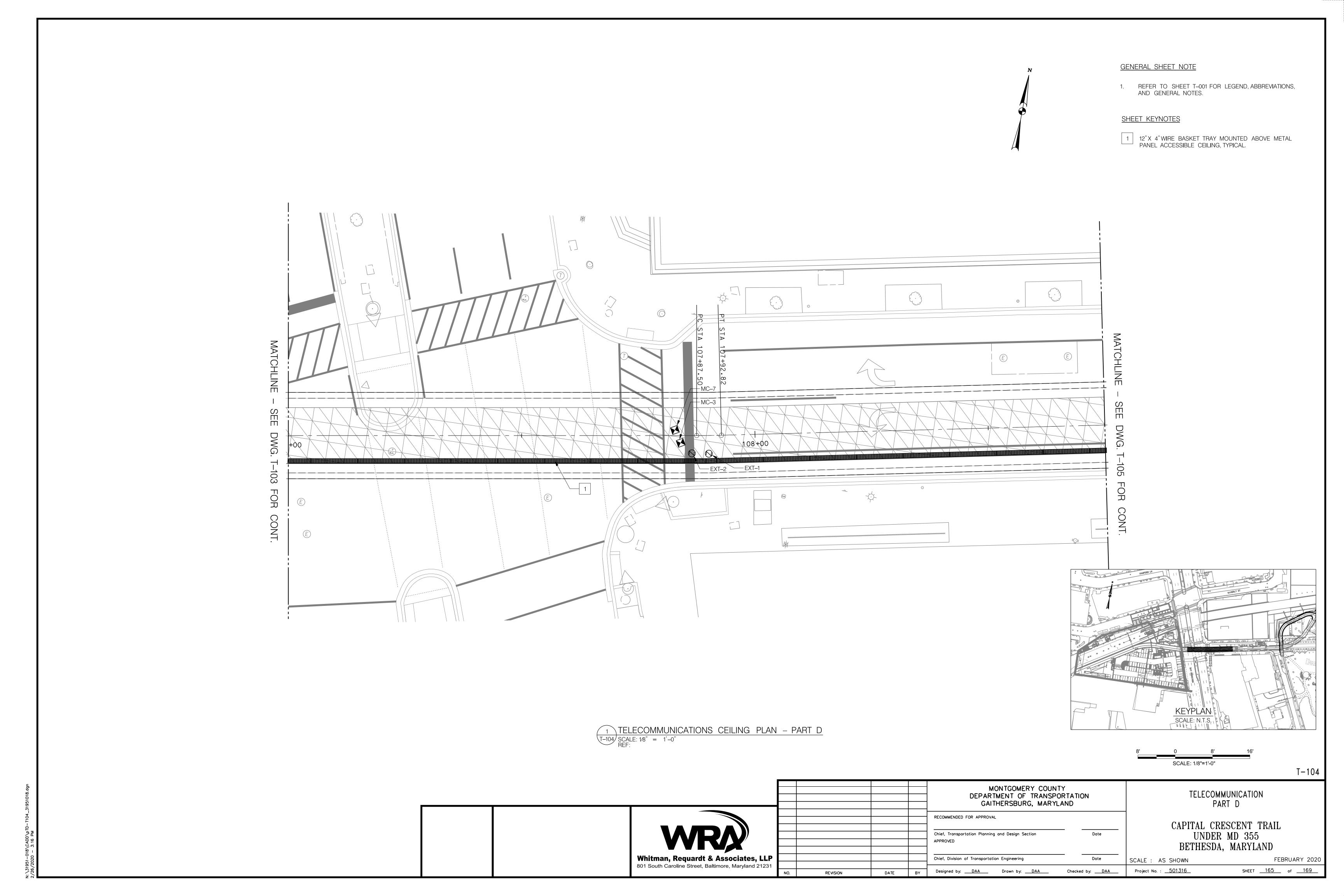


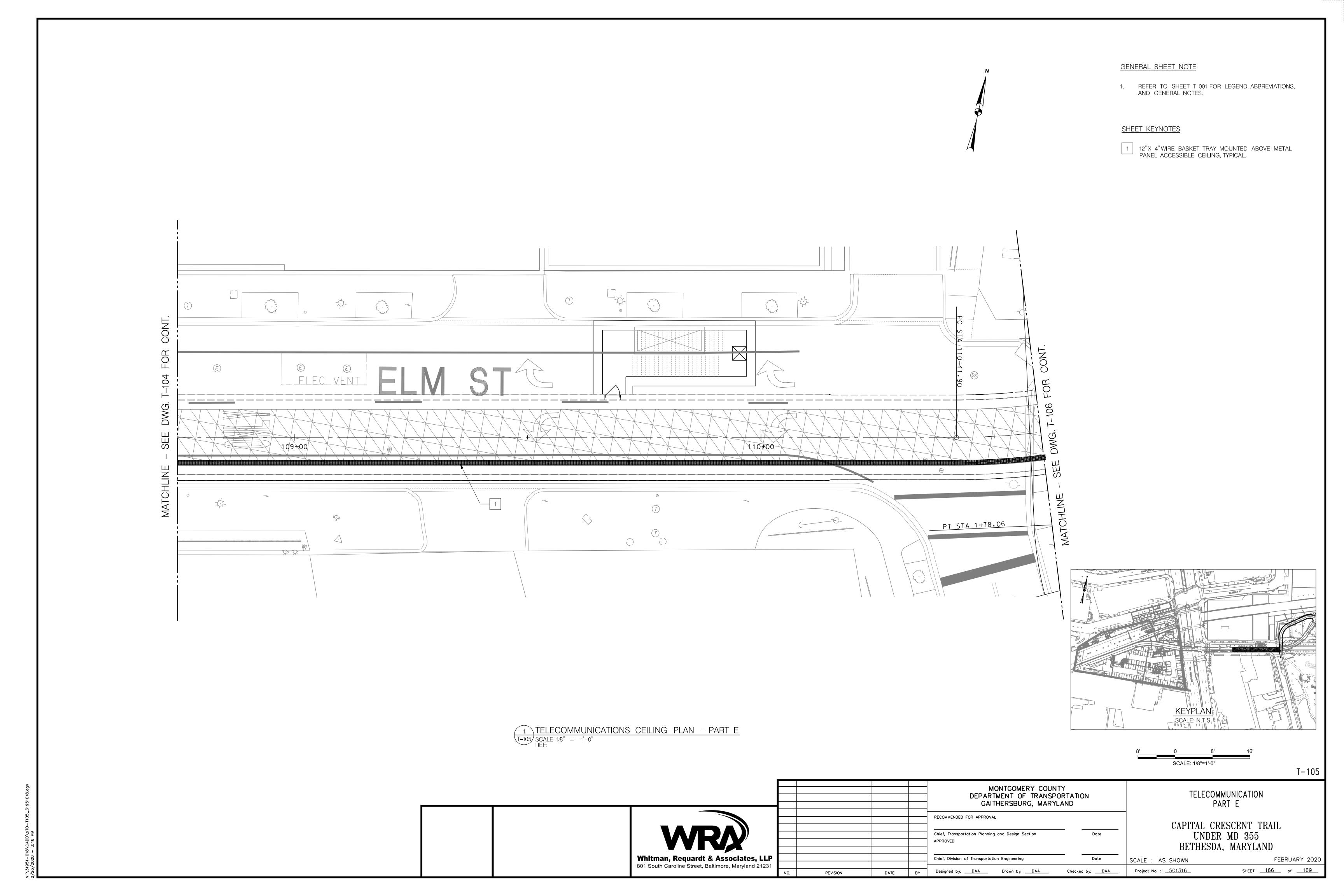
8' 0 8' SCALE: 1/8"=1'-0"

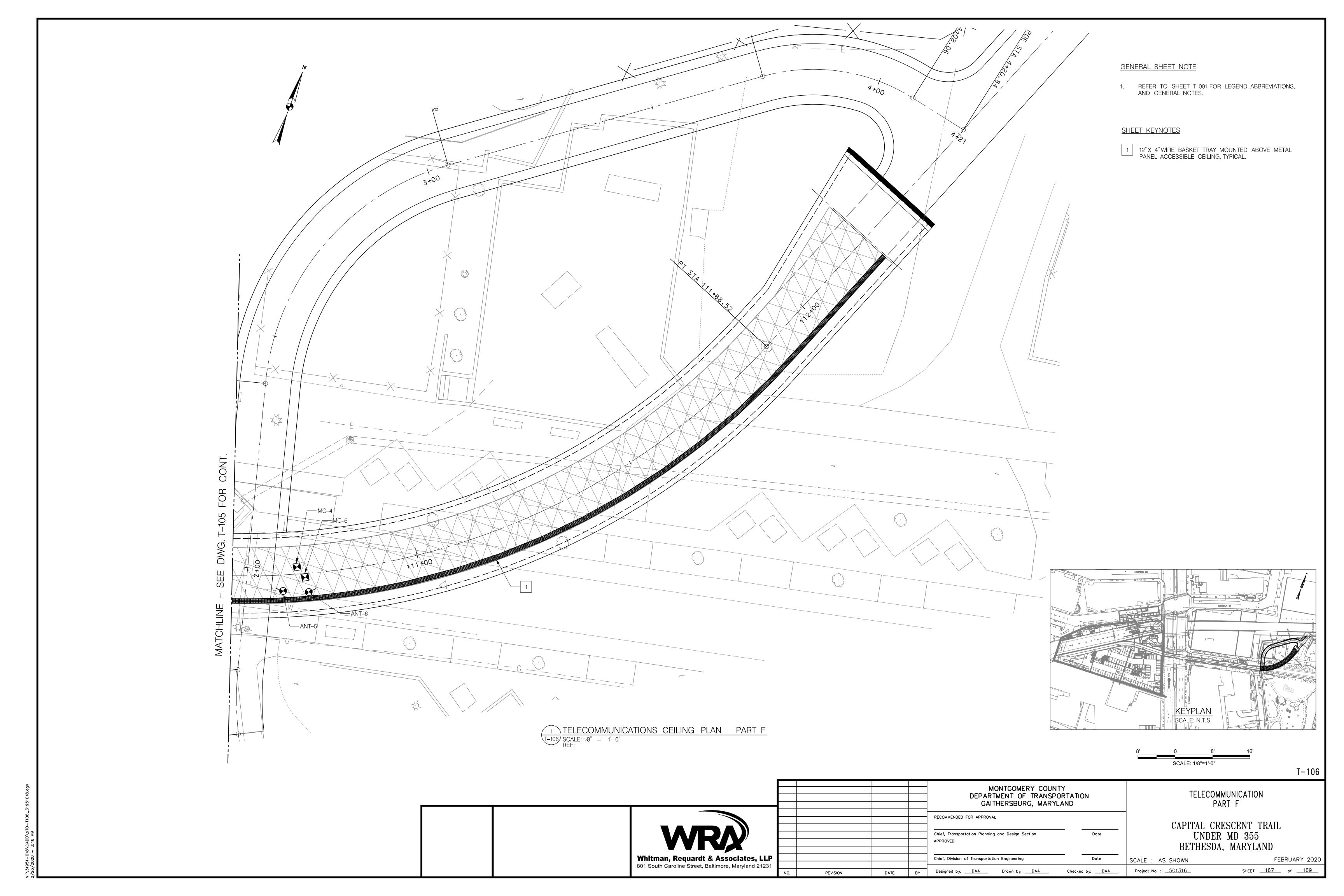
T-102

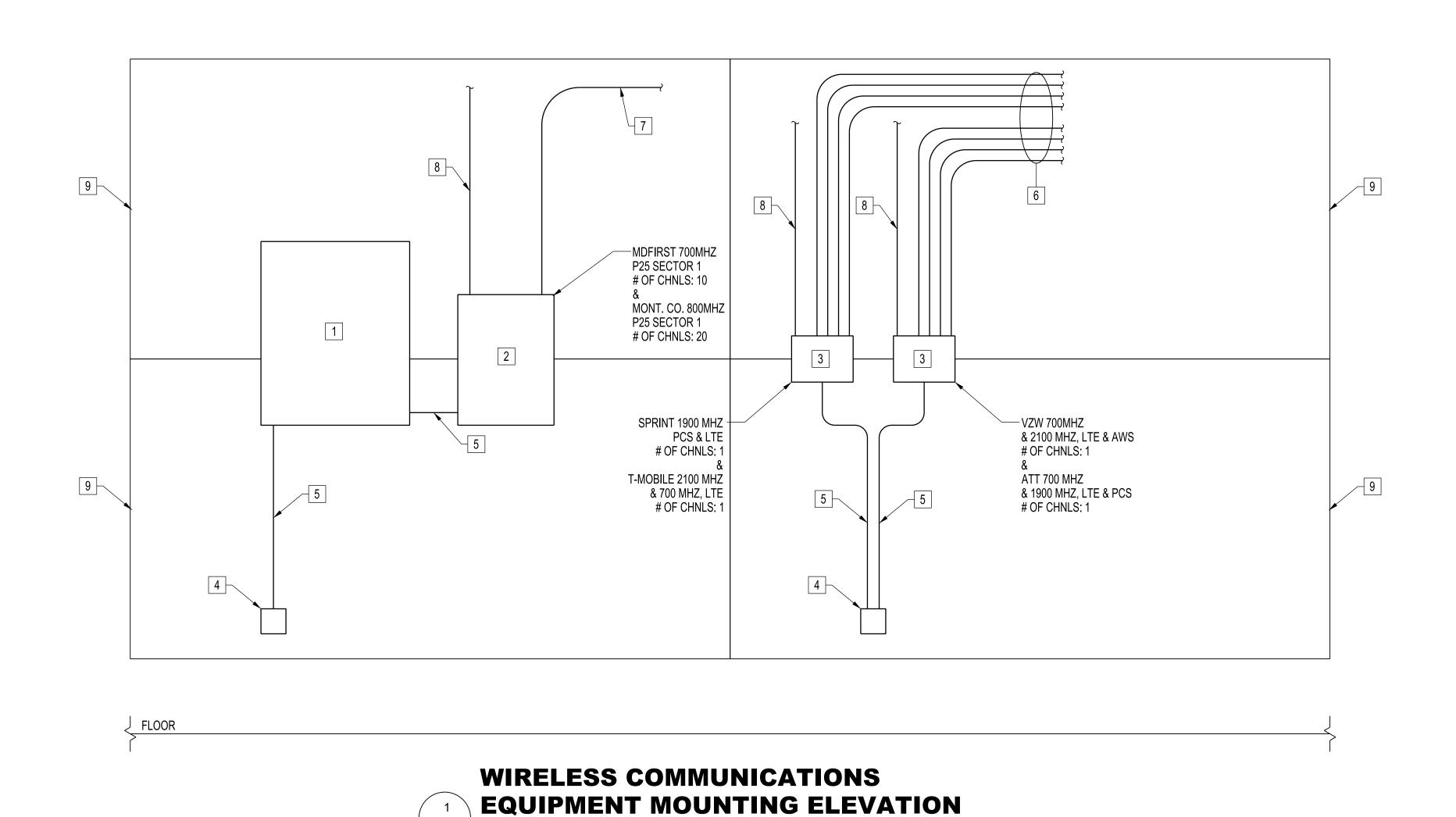
г						MONTGOMERY COUNT DEPARTMENT OF TRANSPO GAITHERSBURG, MARYL	RTATION		UNICATION T B
						RECOMMENDED FOR APPROVAL		CAPITAL CRE	SCENT TRAIL
						Chief, Transportation Planning and Design Section APPROVED	Date	UNDER	MD 355 MARYLAND
	Whitman, Requardt & Associates, LLP					Chief, Division of Transportation Engineering	Date	SCALE : AS SHOWN	FEBRUARY 2020
	801 South Caroline Street, Baltimore, Maryland 21231	NO.	REVISION	DATE	BY	Designed by: <u>DAA</u> Drawn by: <u>DAA</u>	Checked by: <u>DAA</u>	Project No. : <u>501316</u>	SHEET <u>163</u> of <u>169</u>







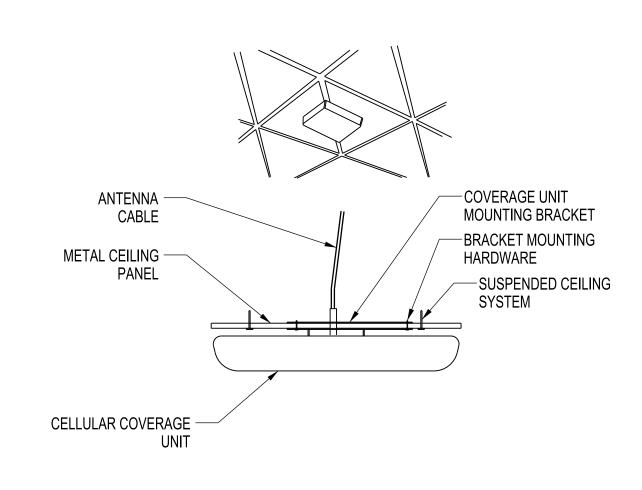




ANTENNA CABLE BRACKET MOUNTING METAL CEILING -HARDWARE PANEL SUSPENDED CEILING SYSTEM - ANTENNA MOUNTING BRACKET DIRECTIONAL ANTENNA

T-501 | SCALE: NONE





CELLULAR COVERAGE UNIT CIELING MOUNTING DETAIL T-501 | SCALE: NONE

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			MONTGOMERY COUNTY DEPARTMENT OF TRANSPOR GAITHERSBURG, MARYLA	PTATION
			RECOMMENDED FOR APPROVAL	
			Chief, Transportation Planning and Design Section APPROVED	Date
			Chief, Division of Transportation Engineering	Date
REVISION	DATE	BY	Designed by: <u>DAA</u> Drawn by: <u>DAA</u>	Checked by: DAA

TELECOMMUNICATION WIRELESS SYSTEM DETAILS

GENERAL NOTES:

DRAWING NOTES:

3 CELLULAR SIGNAL BOOTSER.

9 4' x 8' FIRE RATED PLYWOOD.

5 POWER CORD.

4 ELECTRICAL POWER RECEPTACLE.

1 PUBLIC SAFETY BATTERY BACKUP UNIT.

2 PUBLIC SAFETY BIDIRECTIONAL AMPLIFIER.

6 ETHERNET CABLE TO CELLULAR COVERAGE UNITS.

7 COAXIAL CABLE TO DIRECTIONAL ANTENNAS IN TUNNEL.

8 COAXIAL CABLE TO DONOR ANTENNA MOUNTED ON ROOF OF BLDG. 7272.

AND GENERAL NOTES.

1. REFER TO SHEET T-001 FOR LEGEND, ABBREVIATIONS

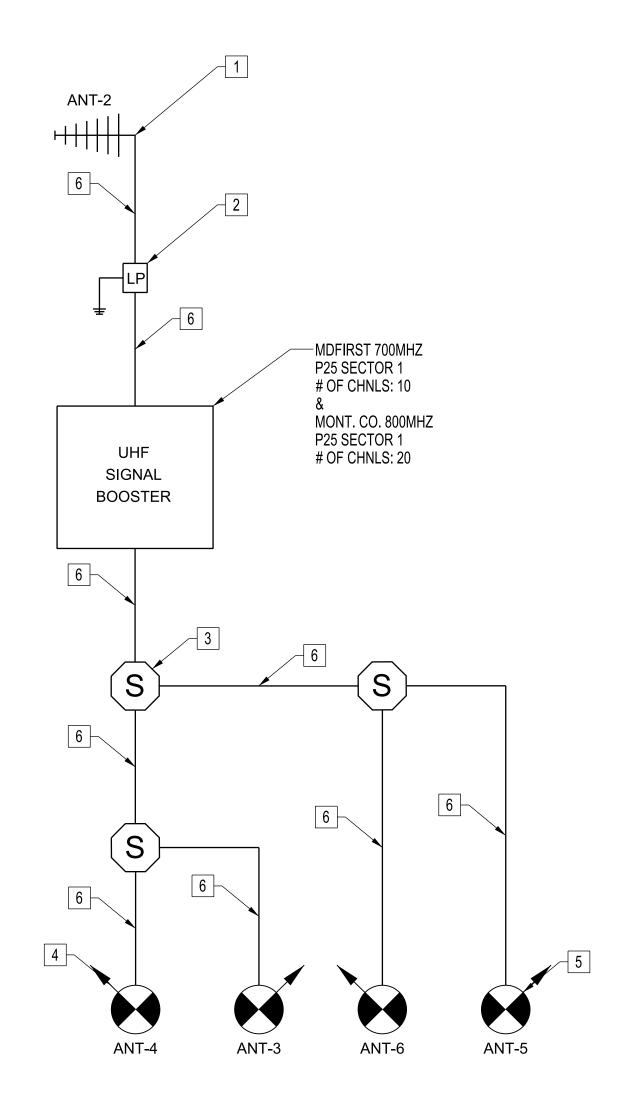
2. DRAWINGS ARE DIAGRAMATIC. CONTRACTOR MUST VERIFY ALL DIMENTIONS IN FIELD.

CAPITAL CRESCENT TRAIL UNDER MD 355 BETHESDA, MARYLAND

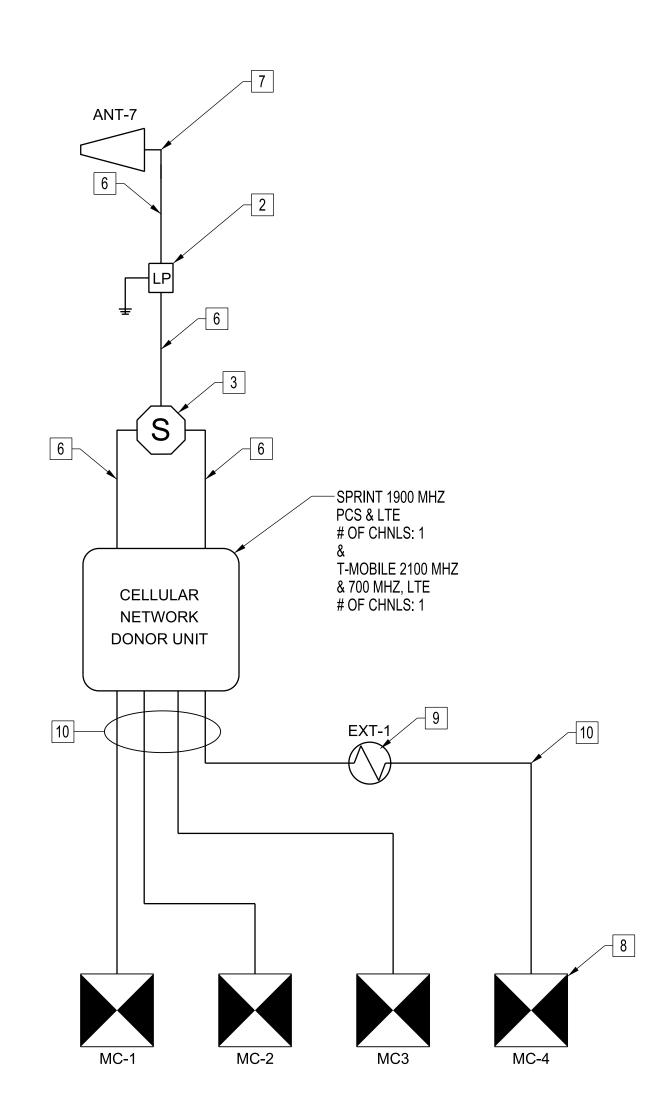
SCALE : AS SHOWN Project No. : <u>501316</u>

FEBRUARY 2020 SHEET <u>168</u> of <u>169</u>

T-501







ONE LINE DIAGRAM CELLPHONE REPEATER SYSTEM SUPPORTING SPRINT & T-MOBILE T-601 | SCALE: NONE

SYSTEM DESCRIPTION:

The system proposed will consist of two solutions. Solution one will provide public safety coverage inside of the tunnel through the use of a rooftop mounted Yagi donor antenna, a Bi-Directional Amplifier(BDA), and a passive Distributed Antenna System(DAS). The DAS portion is comprised of coaxial cabling, antennas, and splitters. This solution will also feature battery backup power and an annunciator panel per Montgomery County requirements for the BDA. The BDA will support 700MHz and 800MHz public safety services. Solution two is a separate layer which will provide commercial wireless operator services within the tunnel. This will be provided by a Cel-Fi Quatra 2000 system manufactured by Nextivity Inc. The Cel-Fi Quatra system is comprised of its own rooftop donor antenna, which feed network units that amplify the carrier's signals and feed them over twisted pair cabling to coverage units. The coverage units then redistribute and radiate the signal within the area surrounding it. Two of these systems will be required in order to support the major four wireless service operators. One system will supply AT&T & Verizon coverage through their 700, 1900, & 2100MHz bands. The other system will supply T-Mobile and Sprint coverage through their 700,1900, & 2100MHz bands. The installation of these systems will require space to mount antennas outside on a roof or similar area of good coverage, space for the main equipment to be mounted, pathways for coaxial and twisted pair cabling, and space along the tunnel to support mounting antennas, splitters, range extenders, and coverage units.

GENERAL NOTES:

1. DIAGRAMS ARE PRELIMINARY.

2. DEVICE QUANTITIES MAY CHANGE.

DRAWING NOTES:

1 746-896 MHZ YAGI DONOR ANTENNA.

2 LIGHTNING ARRESTOR CONNECTED TO GROUND.

3 RF SIGNAL/POWER SPLITTER, TYPICAL.

4 DIRECTIONAL PANEL ANTENNA, TYPICAL.

5 OMNIDIRECTIONAL ANTENNA, TYPICAL.

6 COAXIAL CABLE.

7 698-960/1710-2700 MHZ DIRECTIONAL ANTENNA.

8 COVERAGE UNIT, TYPICAL.

9 TWISTED PAIR SIGNAL EXTENDER.

10 TWISTED PAIR CABLE.

ONE LINE DIAGRAM CELLPHONE REPEATER SYSTEM SUPPORTING VZW & AT&T

- VZW 700MHZ

OF CHNLS: 1

ATT 700 MHZ

OF CHNLS: 1

CELLULAR

NETWORK

DONOR UNIT

& 2100 MHZ, LTE & AWS

& 1900 MHZ, LTE & PCS

T-601 | SCALE: NONE

T-601

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				MONTGOMERY COUNTY DEPARTMENT OF TRANSPORTATION GAITHERSBURG, MARYLAND		
				RECOMMENDED FOR APPROVAL		-
				Chief, Transportation Planning and Design Section APPROVED	Date	
				Chief, Division of Transportation Engineering	Date	SO
0.	REVISION	DATE	BY	Designed by: <u>DAA</u> Drown by: <u>DAA</u> Checke	d by: <u>DAA</u>	

TELECOMMUNICATION WIRELESS SYSTEM DIAGRAM

CAPITAL CRESCENT TRAIL UNDER MD 355 BETHESDA, MARYLAND

SCALE : AS SHOWN Project No. : <u>501316</u>

FEBRUARY 2020 SHEET 169 of 169