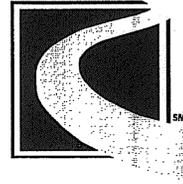


MARYLAND TRANSPORTATION AUTHORITY



FT-2432-000-006

FORT McHENRY TUNNEL

MISCELLANEOUS STRUCTURAL REPAIRS INSIDE THE FORT McHENRY TUNNEL (B)

BALTIMORE CITY

CONTRACT NO. FT-2432-000-006

INDEX OF SHEETS

SHEET NO.	DWG. NO.	DESCRIPTION
1	T-1.00	TITLE SHEET
2	S-1.00	PLAN AND ELEVATION - 1 OF 2
3	S-1.01	PLAN AND ELEVATION - 2 OF 2
4	S-2.00	DEFECT LOCATION TABLES
5	S-2.01	DECK REPAIR DETAILS

FOR THE CONVENIENCE AND INFORMATION OF BIDDERS, PRINTS OF PLANS OF THE PERTINENT EXISTING STRUCTURE ARE INCLUDED WITH THIS CONTRACT. NO RESPONSIBILITY FOR THEIR ACCURACY OR COMPLETENESS IS ASSUMED BY THE MARYLAND TRANSPORTATION AUTHORITY. DIMENSIONS, DETAILS, ETC. SHOWN MAY NOT BE AS BUILT.

INCLUDED FOR YOUR USE ARE THE FOLLOWING:

SF1, SF2, SF34, SF34A (BALTO. CITY CONTRACT NO. 2563)
SCI, SGI, SG2, SG3 (BALTO. CITY CONTRACT NO. 2547)

SPECIFICATIONS

The Specifications for all work on this project shall be State Highway Administration's Standard Specifications entitled "Standard Specifications for Construction And Materials," dated July 2008, and all additions and/or revisions thereto; and other Specifications in the Special Provisions.

STANDARDS

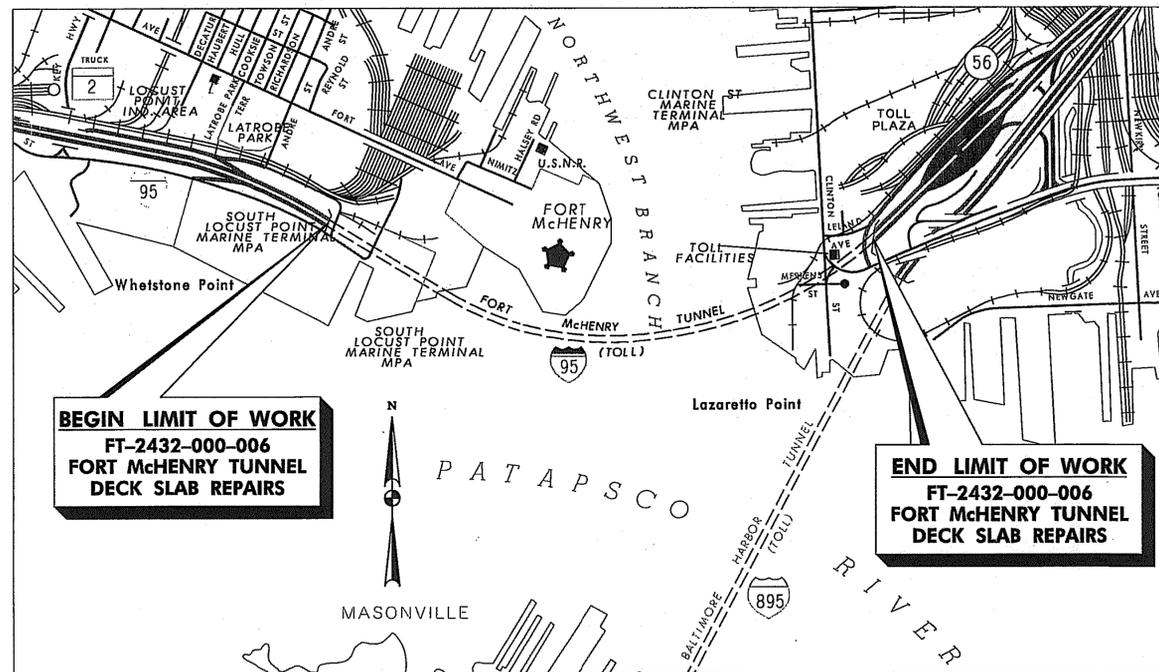
Standards for this contract will be those of the State Highway Administration. It will be the responsibility of the Contractor that the Standards in his possession are the latest S.H.A. Standards as of the date of advertisement.

COMPLETENESS OF DOCUMENTS

The Maryland Transportation Authority shall only be responsible for the completeness of documents obtained directly from the Maryland Transportation Authority's cashier's office. Failure to attach addenda may cause the bid to be irregular.

UTILITIES

The location of utilities shown on the plans are for information and guidance only. No guarantee is made of the accuracy of said locations.



LOCATION MAP
SCALE: 1"=2000'

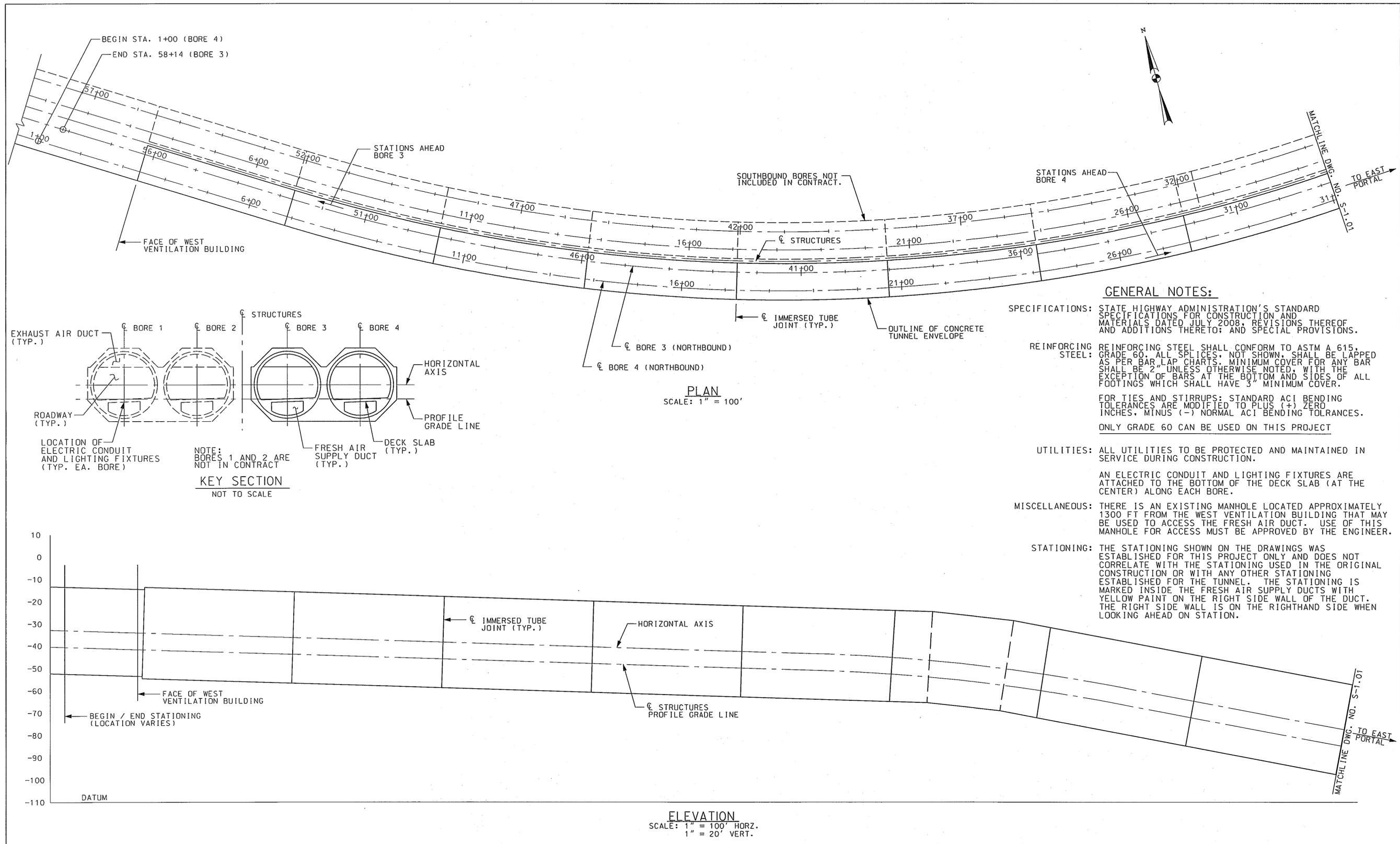
STV | PB Americas II
joint venture

7125 AMBASSADOR ROAD
SUITE 200
BALTIMORE, MARYLAND 21244

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. 26066 , EXPIRATION DATE: 9/24/2011

MARYLAND TRANSPORTATION AUTHORITY	
RECOMMENDED FOR APPROVAL	9/14/10 DATE
DIRECTOR, ENGINEERING DIVISION	9/14/10 DATE
APPROVED	9/14/10 DATE
CHIEF ENGINEER, OFFICE OF ENGINEERING AND CONSTRUCTION	9/21/10 DATE
APPROVED	9/21/10 DATE
EXECUTIVE SECRETARY	



GENERAL NOTES:

- SPECIFICATIONS:** STATE HIGHWAY ADMINISTRATION'S STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS DATED JULY 2008, REVISIONS THEREOF AND ADDITIONS THERETO; AND SPECIAL PROVISIONS.
- REINFORCING STEEL:** REINFORCING STEEL SHALL CONFORM TO ASTM A 615, GRADE 60. ALL SPLICES, NOT SHOWN, SHALL BE LAPPED AS PER BAR LAP CHARTS. MINIMUM COVER FOR ANY BAR SHALL BE 2" UNLESS OTHERWISE NOTED, WITH THE EXCEPTION OF BARS AT THE BOTTOM AND SIDES OF ALL FOOTINGS WHICH SHALL HAVE 3" MINIMUM COVER.
- FOR TIES AND STIRRUPS:** STANDARD ACI BENDING TOLERANCES ARE MODIFIED TO PLUS (+) ZERO INCHES, MINUS (-) NORMAL ACI BENDING TOLERANCES. ONLY GRADE 60 CAN BE USED ON THIS PROJECT
- UTILITIES:** ALL UTILITIES TO BE PROTECTED AND MAINTAINED IN SERVICE DURING CONSTRUCTION.
- MISCELLANEOUS:** AN ELECTRIC CONDUIT AND LIGHTING FIXTURES ARE ATTACHED TO THE BOTTOM OF THE DECK SLAB (AT THE CENTER) ALONG EACH BORE. THERE IS AN EXISTING MANHOLE LOCATED APPROXIMATELY 1300 FT FROM THE WEST VENTILATION BUILDING THAT MAY BE USED TO ACCESS THE FRESH AIR DUCT. USE OF THIS MANHOLE FOR ACCESS MUST BE APPROVED BY THE ENGINEER.
- STATIONING:** THE STATIONING SHOWN ON THE DRAWINGS WAS ESTABLISHED FOR THIS PROJECT ONLY AND DOES NOT CORRELATE WITH THE STATIONING USED IN THE ORIGINAL CONSTRUCTION OR WITH ANY OTHER STATIONING ESTABLISHED FOR THE TUNNEL. THE STATIONING IS MARKED INSIDE THE FRESH AIR SUPPLY DUCTS WITH YELLOW PAINT ON THE RIGHT SIDE WALL OF THE DUCT. THE RIGHT SIDE WALL IS ON THE RIGHTHAND SIDE WHEN LOOKING AHEAD ON STATION.

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MARYLAND TRANSPORTATION AUTHORITY
 Engineering Division

ADDENDUMS & REVISIONS			
NO.	DESCRIPTION	BY	DATE

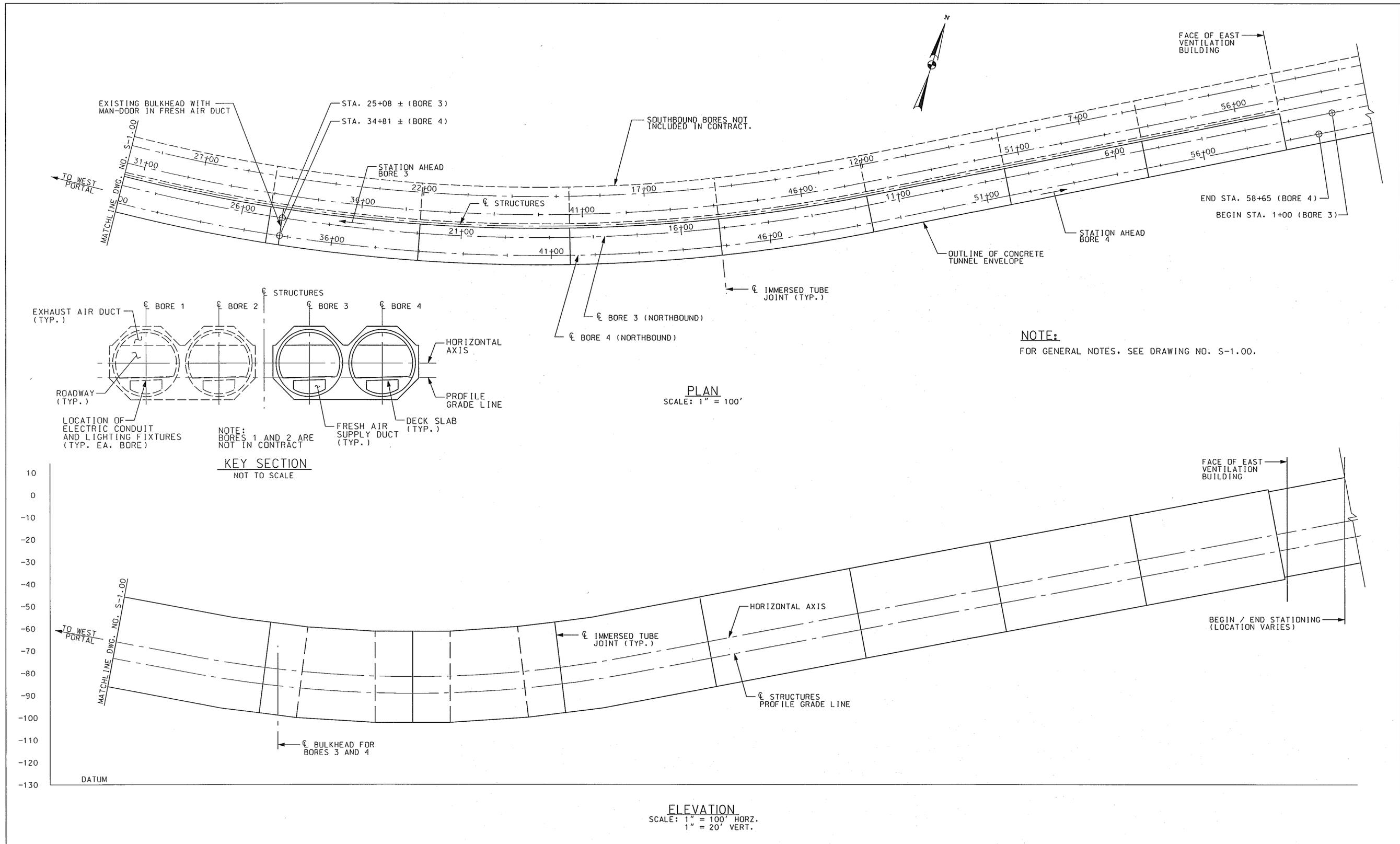
FORT McHENRY TUNNEL
MISCELLANEOUS STRUCTURAL REPAIRS
INSIDE THE FORT McHENRY TUNNEL (B)
 BALTIMORE CITY
 PLAN AND ELEVATION - 1 OF 2

DESIGNED BY RH DRAWN BY GBS CHECKED BY JPW
 CONST. REVIEW BY DATE 05/2010 SCALE AS SHOWN

CONTRACT NO.
FT-2432-000-006

DRAWING NO.
S-1.00

SHEET NO.
2 OF 5



STV | PB Americas II
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 7125 AMBASSADOR ROAD
 SUITE 200
 BALTIMORE, MARYLAND 21244

MARYLAND TRANSPORTATION AUTHORITY
 Engineering Division

ADDENDUMS & REVISIONS			
NO.	DESCRIPTION	BY	DATE

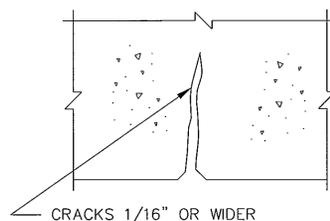
FORT McHENRY TUNNEL
MISCELLANEOUS STRUCTURAL REPAIRS
INSIDE THE FORT McHENRY TUNNEL (B)
 BALTIMORE CITY
 PLAN AND ELEVATION - 2 OF 2

DESIGNED BY RH DRAWN BY GBS CHECKED BY JPW
 CONST. REVIEW BY DATE 05/2010 SCALE AS SHOWN

CONTRACT NO.
 FT-2432-000-006
 DRAWING NO.
S-1.01
 SHEET NO.
 3 OF 5

LOCATION OF SLAB DEFECTS NORTHBOUND BORE #3															
STATIONING		SPALLS (SF)						DELAM (SF)		CRACKS (LF)					
		S1		S2		S3		D		C1		C2		C3	
FROM	TO	Slab	Walls	Slab	Walls	Slab	Walls	Slab	Walls	Slab	Walls	Slab	Walls	Slab	Walls
01+00	02+00	0	1	0	1	32	2	24	62	74	7	0	0	0	0
02+00	03+00	1	4	2	5	0	0	310	68	18	35	0	0	0	0
03+00	04+00	2	1	4	2	0	0	312	69	30	27	0	3	0	0
04+00	05+00	4	2	0.5	2	0	0	388	60	0	11	0	3	0	0
05+00	06+00	4	3	8	1	0	6	249	44	30	16	0	3	0	0
06+00	07+00	10	0	0	5	0	0	446	43	0	14	0	0	0	0
07+00	08+00	3	9	5	6	0	0	455	70	0	22	0	21	0	0
08+00	09+00	5	1	9	4	2	0	304	84	28	8	0	0	0	0
09+00	10+00	3	2	13	9	0	0	259	47	68	24	0	0	0	0
10+00	11+00	1	0	4	8	0	0	345	115	36	40	0	0	0	0
11+00	12+00	1	4	6	12	0	0	434	60	10	41	0	3	0	0
12+00	13+00	4	2	4	3	0	0	275	45	30	20	0	5	0	0
13+00	14+00	0	4	0	2	4	0	280	37	44	15	0	3	0	0
14+00	15+00	3	0	0	2	0	0	410	38	54	22	0	6	0	0
15+00	16+00	2	3	1	1	0	0	347	65	30	18	0	11	0	0
16+00	17+00	7	0	18	0	6	0	424	21	0	28	0	9	0	0
17+00	18+00	6	0	2	1	5	0	500	35	27	22	0	12	0	0
18+00	19+00	6	0	8	2	26	0	398	28	26	27	0	12	0	0
19+00	20+00	0	1	18	1	0	0	382	49	20	43	0	3	0	0
20+00	21+00	0	0	11	0	8	0	603	44	0	49	0	3	0	0
21+00	22+00	4	1	22	0	14	0	447	53	15	42	0	15	0	0
22+00	23+00	2	6	8	2	125	0	456	83	10	31	0	2	0	0
23+00	24+00	2	3	22	0	55	0	501	72	0	48	0	6	0	0
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25+00	26+00	6	7	14	0	50	0	356	4	34	60	0	3	0	0
26+00	27+00	0	2	12	1	0	0	476	48	20	50	0	0	0	0
27+00	28+00	2	1	13	1	0	0	462	86	64	39	0	7	0	0
28+00	29+00	2	5	16	3	0	0	392	60	32	54	0	3	0	0
29+00	30+00	0	0	19	0	75	0	231	64	0	19	0	6	0	0
30+00	31+00	6	3	2	0	41	0	428	66	10	30	0	10	0	0
31+00	32+00	2	1	0	0	0	0	451	51	0	13	0	14	0	0
32+00	33+00	4	0	0	0	120	0	260	87	0	5	0	20	0	0
33+00	34+00	0	4	0	0	60	0	387	62	0	19	0	6	0	0
34+00	35+00	2	3	16	0	62	0	377	47	10	37	0	10	0	0
35+00	36+00	6	3	4	0	48	0	380	72	22	20	0	2	0	6
36+00	37+00	6	1	6	6	0	0	338	79	20	15	0	8	0	0
37+00	38+00	0	2	9	0	0	0	318	78	23	41	0	7	0	0
38+00	39+00	7	1	4	0	8	0	276	44	18	26	0	0	0	0
39+00	40+00	3	1	1	0	0	0	259	43	5	16	0	5	0	0
40+00	41+00	5	0	2	0	42	0	278	50	5	32	0	0	0	0
41+00	42+00	3	1	5	0	49	0	370	76	8	43	0	8	0	0
42+00	43+00	2	1	10	0	0	0	320	57	0	29	0	5	0	0
43+00	44+00	0	2	10	2	0	0	357	61	45	20	0	8	0	0
44+00	45+00	2	1	12	2	8	0	396	74	68	23	0	4	0	0
45+00	46+00	1	2	7	3	0	0	297	54	94	45	0	0	0	0
46+00	47+00	1	3	4	4	0	0	281	44	69	44	0	23	0	0
47+00	48+00	5	2	4	3	0	0	417	25	90	36	0	5	0	0
48+00	49+00	0	4	16	2	0	0	307	34	131	61	0	4	0	0
49+00	50+00	1	1	15	6	70	0	475	49	28	65	0	13	0	5
50+00	51+00	8	0	17	2	0	0	497	65	38	49	0	11	0	0
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55+00	56+00	3	5	26	0	0	0	289	19	8	25	0	0	0	1
56+00	57+00	0	0	0	0	2	12	15	215	14	0	0	0	0	3
57+00	58+00	0	0	0	0	6	0	43	18	188	16	0	0	0	0
58+00	58+14	0	0	0	0	0	0	0	0	42	15	0	0	0	0
TOTALS		171	116	453	114	966	10	20,733	3,052	2,015	1,837	0	314	0	19

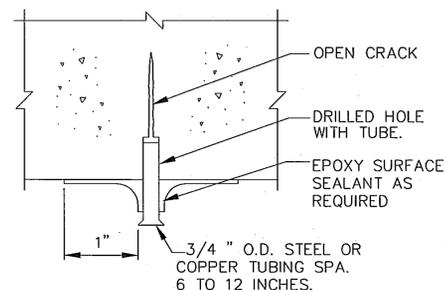
LOCATION OF SLAB DEFECTS NORTHBOUND BORE #4															
STATIONING		SPALLS (SF)						DELAM (SF)		CRACKS (LF)					
		S1		S2		S3		D		C1		C2		C3	
FROM	TO	Slab	Walls	Slab	Walls	Slab	Walls	Slab	Walls	Slab	Walls	Slab	Walls	Slab	Walls
01+00	02+00	0	15	0	13	0	0	99	22	175	16	0	0	0	0
02+00	03+00	0	0	0	9	2	0	95	20	92	17	0	0	0	0
03+00	04+00	4	3	3	0	0	0	194	73	28	31	0	0	0	0
04+00	05+00	0	1	0	2	0	1	329	104	10	46	0	0	0	0
05+00	06+00	1	2	17	4	0	3	473	75	67	24	0	14	0	4
06+00	07+00	2	2	26	0	0	2	400	77	11	53	0	20	0	0
07+00	08+00	7	1	34	3	10	0	440	68	0	48	0	0	0	0
08+00	09+00	4	1	16	0	10	0	498	58	4	36	0	8	0	0
09+00	10+00	3	1	7	10	15	0	439	58	3	61	0	5	0	0
10+00	11+00	0	0	16	0	0	0	384	57	0	44	0	5	0	2
11+00	12+00	0	5	41	3	0	0	362	94	0	31	0	3	0	3
12+00	13+00	0	1	2.5	4	0	0	302	69	0	33	0	4	0	0
13+00	14+00	1	3	1	1	0	0	189	46	11	29	0	3	0	0
14+00	15+00	0	6	3	0	0	0	307	69	0	28	0	3	0	4
15+00	16+00	2	0	24	2	0	0	244	83	0	23	0	7	0	4
16+00	17+00	4	2	21	1	16	0	316	52	0	35	0	24	0	4
17+00	18+00	2	0	16	0	85	0	241	58	0	20	0	11	0	0
18+00	19+00	3.5	0	4	0	79	0	292	29	4	27	0	8	0	3
19+00	20+00	1	0	2	3	0	0	170	61	20	20	0	10	0	0
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21+00	22+00	19	0	24	0	0	0	340	26	4	38	0	13	0	0
22+00	23+00	1	0	6	4	92	1	231	48	0	15	0	3	0	0
23+00	24+00	2	2	31	2	20	0	232	51	8	8	0	19	0	0
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25+00	26+00	2	0	49	0	0	0	203	39	19	26	0	14	0	0
26+00	27+00	0	0	0	0	0	0	183	22	0	16	0	12	0	0
27+00	28+00	0	0	0	1	0	0	183	21	0	8	0	13	0	0
28+00	29+00	0	0	6	0	0	0	363	30	68	14	0	13	0	0
29+00	30+00	4	0	13	0	40	0	340	36	24	10	0	29	0	4
30+00	31+00	0	0	12	0	51	0	459	34	10	20	0	3	0	0
31+00	32+00	0	0	7	0	0	0	555	78	25	12	0	7	0	0
32+00	33+00	4	0	14	0	0	0	396	28	9	26	0	16	0	0
33+00	34+00	5	0	0	2	0	0	209	20	15	29	0	16	0	0
34+00	34+81	13	0	25	0	0	0	416	29	0	15	0	12	0	0
34+81	36+00	3	0	40	0	112	0	483	48	24	55	0	17	0	3
36+00	37+00	0	0	50.5	0	125	0	308	24	0	31	0	10	0	0
37+00	38+00	0	0	20	0	30	0	420	41	10	17	0	17	0	0
38+00	39+00	0	0	22	0	0	0	474	41	0	28	0	18	0	0
39+00	40+00	0	0	5	0	10	0	312	33	8	31	0	6	0	0
40+00	41+00	0	0	8	0	0	0	230	25	12	23	0	6	0	0
41+00	42+00	0	0	19	0	30	0	410	20	10	38	0	6	0	0
42+00	43+00	5	0	17	0	28	0	376	16	11	35	0	12	0	0
43+00	44+00	0	0	17	0										



CRACK

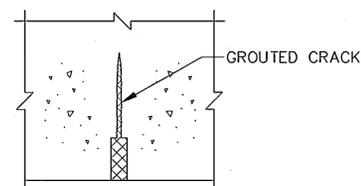
STEP A

CLEAN OUT CRACK WITH HAND TOOLS, HIGH PRESSURE AIR BLAST AND VACUUM CLEAN SURFACE.



STEP B

- A. SEAL SURFACE OF CRACK WITH EPOXY SURFACE SEALANT. SEAL SHALL COMPLETELY BRIDGE THE CRACK WHEN APPLIED TO CONCRETE FACE.
- B. DRILL HOLES AND INSERT PORTS TO A DIAMETER AND DEPTH SUFFICIENT TO ASSURE A SNUG FIT OF THE PORT.



STEP C

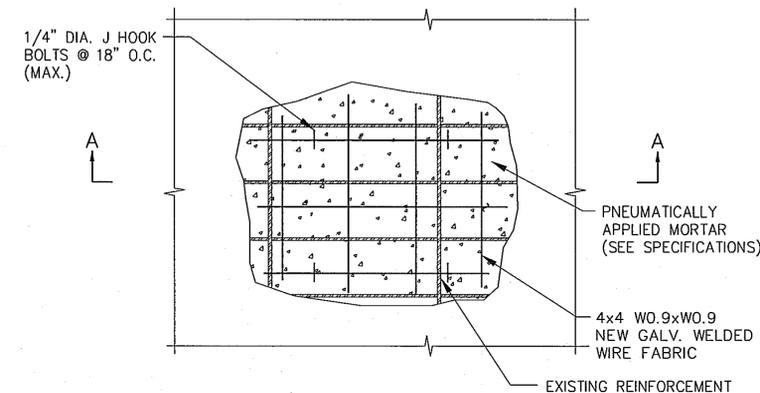
- A. INJECT EPOXY AS DETAILED IN THE SPECIFICATIONS. FOLLOW MANUFACTURER INSTRUCTIONS FOR CURING TIME. REMOVE A MINIMUM AMOUNT OF EPOXY SURFACE SEALANT AND SEALER TO THE SATISFACTION OF THE ENGINEER.
- B. CUT OFF INJECTION TUBE FLUSH WITH CONCRETE FACE.
- C. PATCH OVER INJECTION TUBE AND GRIND EPOXY SURFACE SEALANT FLUSH WITH THE ORIGINAL SURFACE.

CRACK REPAIR DETAILS BY EPOXY INJECTION

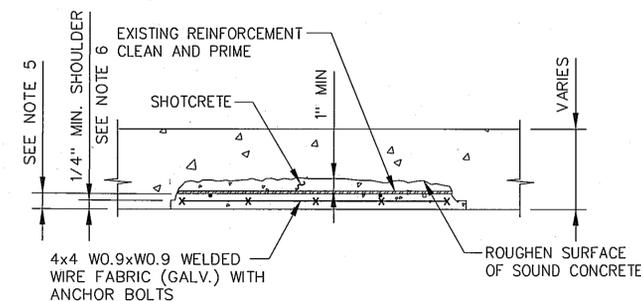
SCALE: NOT TO SCALE

CRACK REPAIR NOTES:

- 1. THE CONTRACTOR SHALL INJECT CRACKS WIDER THAN 1/16" WITH EPOXY. NO OTHER CRACKS SHALL BE INJECTED UNLESS OTHERWISE DIRECTED BY THE ENGINEER. ANY ADDITIONAL CRACKS THAT THE ENGINEER DIRECTS TO BE FILLED SHALL BE PAID AT THE CONTRACT UNIT PRICE.
- 2. FOLLOW MANUFACTURER'S RECOMMENDATIONS FOR INSTALLATION OF GROUT MATERIAL.



REFLECTED PLAN



SECTION A-A

TYPICAL SURFACE REPAIR

SCALE: 2" = 1'-0"

GENERAL REPAIR NOTES:

- 1. THE LOCATION AND EXTENT OF EACH TYPE OF REPAIR IS SHOWN IN THE DEFECT LOCATION TABLES. THE ENGINEER AND THE CONTRACTOR SHALL JOINTLY INSPECT EACH ITEM TO BE REPAIRED AND AGREE TO THE EXTENT OF THE REPAIR. THE CONTRACTOR SHALL QUANTIFY ANY ADDITIONAL REPAIRS AND OBTAIN APPROVAL FROM THE ENGINEER PRIOR TO THE START OF REPAIR WORK.
- 2. CONCRETE REPAIRS SHALL BE COMPLETED IN THE FOLLOWING ORDER:
 - A. REMOVE DETERIORATED CONCRETE AND CLEAN REINFORCEMENT.
 - B. SEAL CRACKS BY EPOXY INJECTION.
 - C. PREP CLEANED REINFORCEMENT WITH ZINC COATING. PLACE GALV. WELDED WIRE FABRIC WITH ANCHOR BOLTS.
 - D. PLACE NEW PNEUMATICALLY APPLIED MORTAR IN SPALLED AREA.
 - E. APPLY CURING COMPOUND TO AREA OF REPAIR.
- 3. ALL EXISTING DIMENSIONS SHOWN ARE APPROXIMATE AND SHALL BE FIELD VERIFIED BY THE CONTRACTOR.
- 4. FOR CRACK REPAIR SEE SPECIFICATION SECTION 400-03. SEE SPECIFICATION SECTION 423 FOR SURFACE REPAIR.
- 5. THE MINIMUM COVER FOR NEW PNEUMATICALLY APPLIED MORTAR OVER EXISTING OR NEW REINFORCING STEEL SHALL BE 2". IN AREAS WHERE THE COVER OVER THE REINFORCING IS LESS THAN 2", WHEN MEASURED TO THE EXISTING BOTTOM OF ROADWAY SLAB, THE PNEUMATICALLY APPLIED MORTAR SHALL BE BUILT UP TO PROVIDE A MINIMUM COVER OF 2". WHEN NEW PNEUMATICALLY APPLIED MORTAR IS BUILT UP BEYOND THE EXISTING BOTTOM OF ROADWAY SLAB, THE EDGES OF THE PNEUMATICALLY APPLIED MORTAR PATCHES SHALL BE SLOPED 1:1 TO MATCH THE EXISTING BOTTOM OF ROADWAY SLAB.
- 6. SHOULDER TO BE CREATED USING HYDRO-DEMOLITION. SAW CUTTING SHALL NOT BE USED.



7125 AMBASSADOR ROAD
SUITE 200
BALTIMORE, MARYLAND 21244



MARYLAND TRANSPORTATION AUTHORITY

Engineering Division

ADDENDUMS & REVISIONS			
NO.	DESCRIPTION	BY	DATE

FORT McHENRY TUNNEL MISCELLANEOUS STRUCTURAL REPAIRS INSIDE THE FORT McHENRY TUNNEL (B)			
BALTIMORE CITY DECK REPAIR DETAILS			
DESIGNED BY <u> RH </u>	DRAWN BY <u> GBS </u>	CHECKED BY <u> JPW </u>	SHEET NO.
CONST. REVIEW BY <u> </u>	DATE <u> 05/2010 </u>	SCALE <u> AS SHOWN </u>	5 OF 5

CONTRACT NO. FT-2432-000-006
DRAWING NO. S-2.01
SHEET NO. 5 OF 5