



December 12, 2022

Mr. Scott Green, PE
 Strand Associates, Inc.
 615 Elsinore Place, Suite 320
 Cincinnati, Ohio 45202

Re: Pavement Cores
 GPHC - Embschoff Woods Pavement Evaluation
 Cincinnati, Ohio
 Geotechnology Project No. J041853.04

Dear Mr. Green:

Presented in this report are the results of the pavement cores completed at Embshoff Woods and Nature Preserve in Cincinnati, Ohio. Our services were performed in general accordance with our Proposal P041853.04, which was dated September 21, 2022 and authorized via Task Order No. 22-02 on November 22, 2022.

The approximate locations of the pavement cores, which are denoted as Pavement Cores PC-1 through PC-8, are illustrated on the attached Pavement Core Location Plans. The cores were drilled on December 8, 2022, and the core holes were patched with cold-patch asphalt. There was no aggregate base beneath the asphalt pavement at any of the cored locations.

A summary of the asphalt pavement thicknesses is provided in Table 1, and photographs of the pavement cores are included as an attachment to this report.

Table 1. Summary of pavement base thicknesses.

Pavement Core	Asphalt Concrete Course Thickness (in.)		Total Asphalt Concrete Core Thickness (in.)
	Surface	Base	
PC-1	1.25	6.75	8
PC-2	1	6	7
PC-3	1.5	6.25	7.75
PC-4	1	8	9
PC-5	1.25	6.5	7.75
PC-6	1.75	7.25	9
PC-7	1.5	7.5	9
PC-8	2	9	11

This report has been prepared on behalf of, and for the exclusive use of, Strand Associates, Inc. for specific application to the named project as described herein. If this report is provided to other parties, it should be provided in its entirety with all supplementary information. In addition, Strand



Associates, Inc. should make it clear that the information is provided for factual data only, and not as a warranty of subsurface conditions presented in this report.

Geotechnology has attempted to conduct the services reported herein in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality and under similar conditions. The field exploration methods used indicate pavement and aggregate subbase conditions only at the specific locations where samples were obtained, only at the time they were obtained, and only to the depths penetrated. Consequently, these conditions may vary gradually, abruptly, and/or nonlinearly between sample locations.

We appreciate the opportunity to provide the material sampling services for this project. If you have any questions regarding this report, or if we may be of any additional service to you, please do not hesitate to contact us.

Respectfully submitted,
GEOTECHNOLOGY, LLC

Joshua L. Weaver, EI
Staff Engineer

Joseph D. Hauber, PE
Principal Geotechnical Engineer

JLW/JDH:jlw/jdh

Attachments: Pavement Core Location Plans
Site Photographs
Pavement Core Photographs

Copies submitted: Strand Associates, Inc. (email)

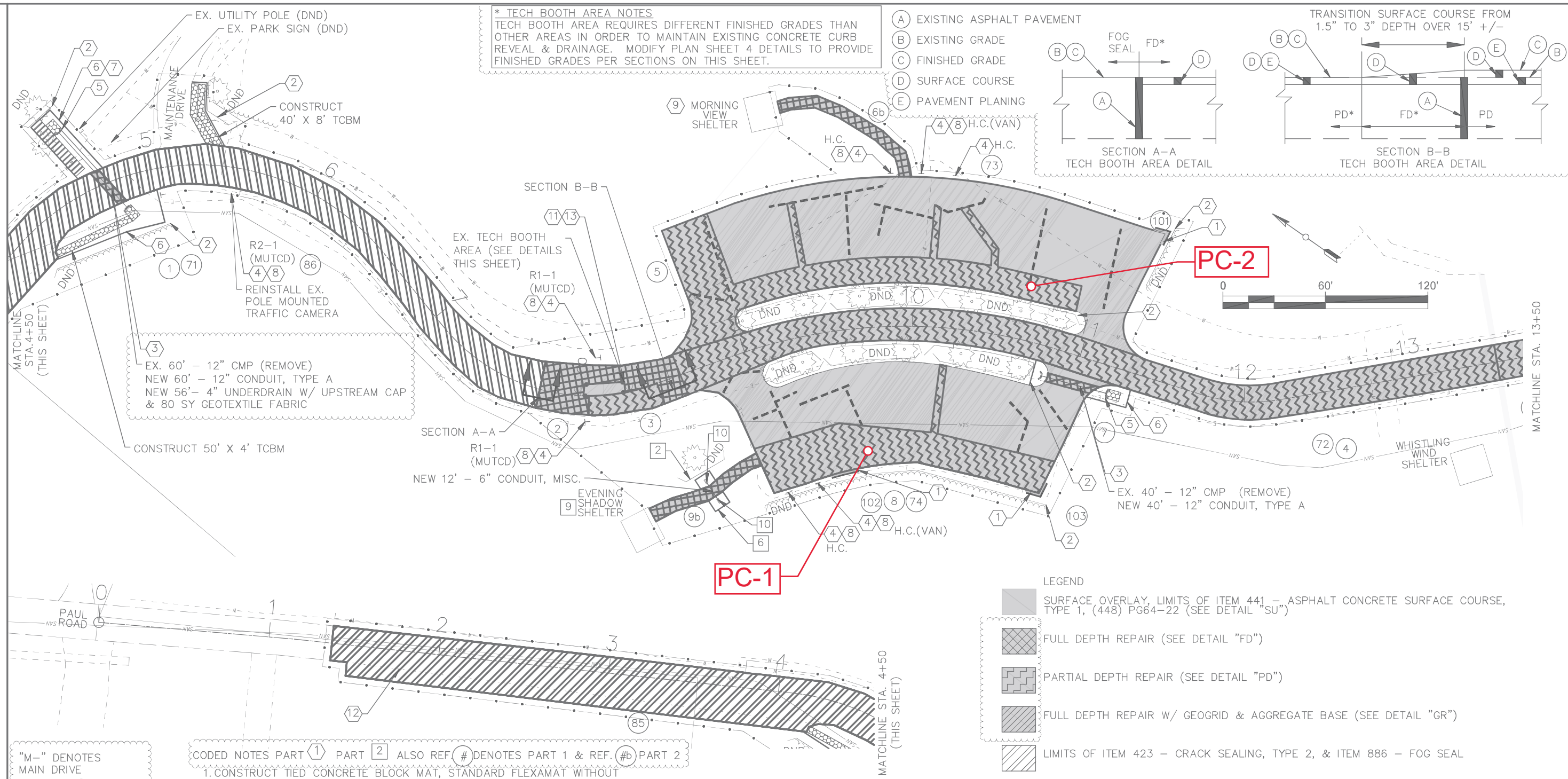
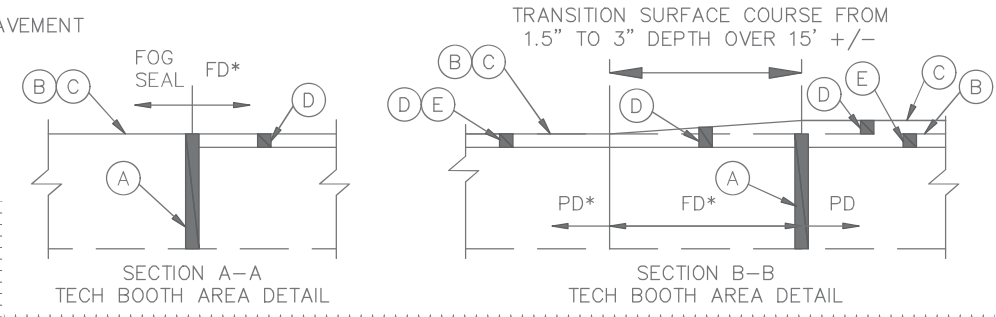


PAVEMENT CORE LOCATION PLANS



*** TECH BOOTH AREA NOTES**
 TECH BOOTH AREA REQUIRES DIFFERENT FINISHED GRADES THAN OTHER AREAS IN ORDER TO MAINTAIN EXISTING CONCRETE CURB REVEAL & DRAINAGE. MODIFY PLAN SHEET 4 DETAILS TO PROVIDE FINISHED GRADES PER SECTIONS ON THIS SHEET.

- (A) EXISTING ASPHALT PAVEMENT
- (B) EXISTING GRADE
- (C) FINISHED GRADE
- (D) SURFACE COURSE
- (E) PAVEMENT PLANING



PC-2

PC-1

- LEGEND**
- SURFACE OVERLAY, LIMITS OF ITEM 441 - ASPHALT CONCRETE SURFACE COURSE, TYPE 1, (448) PG64-22 (SEE DETAIL "SU")
 - FULL DEPTH REPAIR (SEE DETAIL "FD")
 - PARTIAL DEPTH REPAIR (SEE DETAIL "PD")
 - FULL DEPTH REPAIR W/ GEOGRID & AGGREGATE BASE (SEE DETAIL "GR")
 - LIMITS OF ITEM 423 - CRACK SEALING, TYPE 2, & ITEM 886 - FOG SEAL
 - STRESS-ABSORBING MEMBRANE INTERLAYER (SAMI), 24" WIDE, APPROXIMATE LOCATION (SEE GEN. NOTES)
 - DND TREE PROTECTION FENCE, DND (DO NOT DISTURB) (SEE GEN. NOTES & DETAILS)
 - TREE PROTECTION WRAP AROUND EXIST. TREE (SEE GEN. NOTES & DETAILS)
 - TREE PROTECTION MAT PLACED ON GRADE (SEE GEN. NOTES & DETAILS)
 - HEADWALL (SEE DETAILS)
 - TIED-CONCRETE BLOCK MAT (TCBM), STANDARD FLEXAMAT WITHOUT UNDERLAYMENT, OR EQUAL (SEE DETAILS)
 - LIMITS OF CONSTRUCTION
 - SHLD SHOULDER
 - H.C. HANDICAP PARKING (SEE ADA PLAN SHEET DETAIL)
 - MUTCD MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES

"M-" DENOTES MAIN DRIVE

DESC.	Ref. #	Area (SF)
FD	1	123
FD M-	2	1634
PD M-	3	514
PD M-	4	9883
PD	5	5595
FD	7	143
PD	8	3982
SU M-	71	123
SU M-	72	12195
SU	73	17792
SU	74	11865
SEAL M-	85	9406
SEAL M-	86	6714
TCBM	101	15
TCBM	102	16
TCBM	103	15
FD	6b	659
FD	9b	535

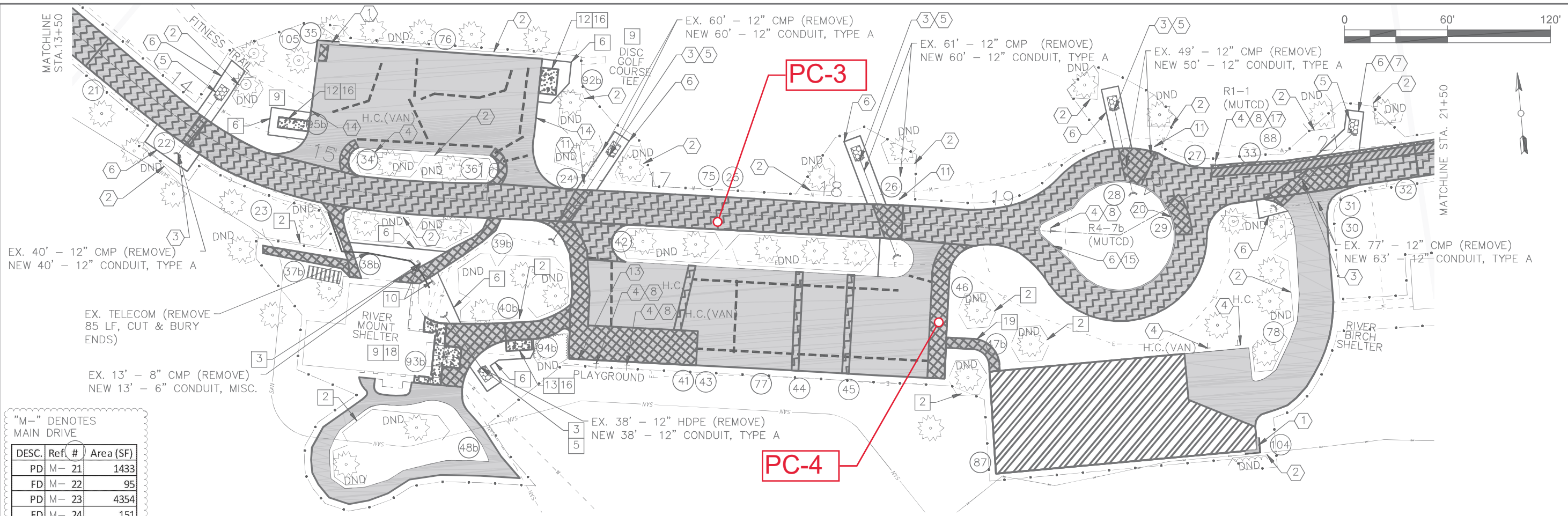
CODED NOTES PART 1 PART 2 ALSO REF. # DENOTES PART 1 & REF. #b PART 2

1. CONSTRUCT TIED CONCRETE BLOCK MAT, STANDARD FLEXAMAT WITHOUT UNDERLAYMENT (OR EQUAL), 4'-WIDE BY LENGTH SHOWN
2. CONSTRUCT TREE PROTECTION FENCE
3. REMOVE EX. CONDUIT; CONSTRUCT NEW CONDUIT, (SEE PLAN LENGTHS & SIZE). CONSTRUCT INLET & OUTLET HEADWALLS
4. ITEM 630 - INSTALL NEW OWNER FURNISHED COMPOSITE SIGN POST. PROVIDE & INSTALL NEW SIGN (SEE ADA PLAN SHEET 16).
5. CONSTRUCT OUTLET PROTECTION WITH TIED CONCRETE BLOCK MAT, STANDARD FLEXAMAT WITHOUT UNDERLAYMENT (OR EQUAL), 5.5'-WIDE BY 6'-BEYOND HEADWALL.
6. GRADING/RESHAPE GRASS AREA PROVIDE 4H:1V SLOPE, (3H:1V MAX) (280 SY)
7. CONSTRUCT EMBANKMENT TO FILL EX. ERODED AREA (15 CY)
8. ITEM 630 - REMOVE EX. SIGN POST & RETURN SIGN TO OWNER.
9. SEE GRADING/ADA PLAN SHEETS (VARIABLE OVERLAY DEPTH)
10. CONSTRUCT HEADWALL (NO OUTLET PROTECTION)
11. REMOVE & RESET EX. SITE FURNISHING (PLANTERS)
12. EX. PARKING BLOCKS ALONG ENTRANCE DRIVE TO REMAIN.
13. EX. BOLLARDS TO REMAIN.

PAVEMENT CORE LOCATION PLAN (APPROX. LOCATION)

DESIGN AGENCY

 DESIGNER
 RM
 REVIEWER
 TZ 04-13-23
 PROJECT ID
 117816
 SHEET TOTAL
 P:7 19



"M-" DENOTES MAIN DRIVE

DESC.	Ref. #	Area (SF)
PD	M- 21	1433
FD	M- 22	95
PD	M- 23	4354
FD	M- 24	151
PD	M- 25	3304
FD	M- 26	271
PD	M- 27	6836
FD	M- 28	316
FD	M- 29	219
FD	M- 30	48
FD	M- 31	498
PD	M- 32	540
GR	M- 33	596
FD	M- 34	105
FD	M- 35	50
FD	M- 36	111
FD	M- 41	2144
PD	M- 42	422
PD	M- 43	154
PD	M- 44	230
PD	M- 45	230
FD	M- 46	815
SU	M- 75	18614
SU	M- 76	8550
SU	M- 77	13934
SU	M- 78	4264
SEAL	M- 87	7695
SHLD	M- 88	178
TCBM	M- 104	15
TCBM	M- 105	23
FD	M- 37b	255
FD	M- 38b	256
FD	M- 39b	446
FD	M- 40b	1127
FD	M- 47b	230
SU	M- 48b	2186
CONC	M- 92b	150
CONC	M- 93b	416
CONC	M- 94b	90
CONC	M- 95b	108

CODING NOTES PART 1 PART 2 ALSO REF. # DENOTES PART 1 & REF. #b PART 2

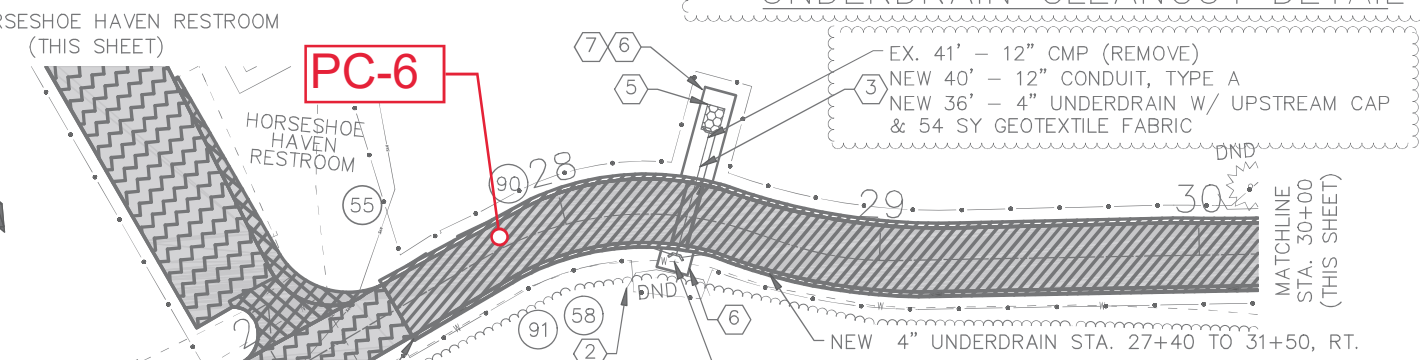
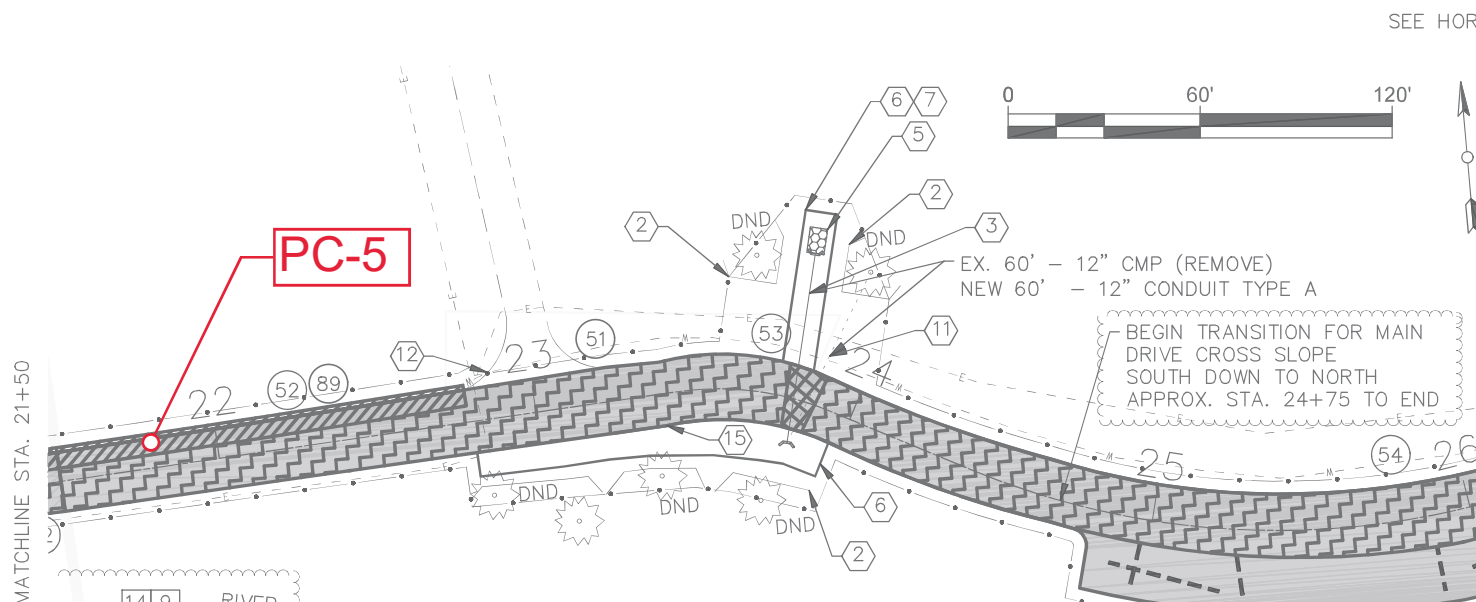
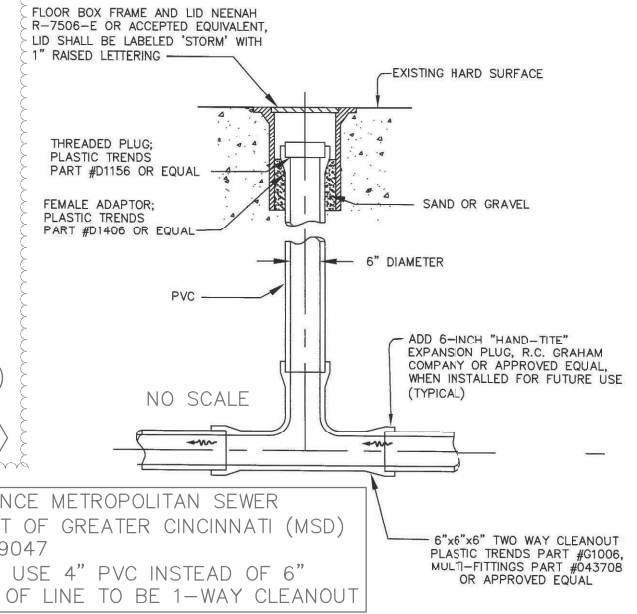
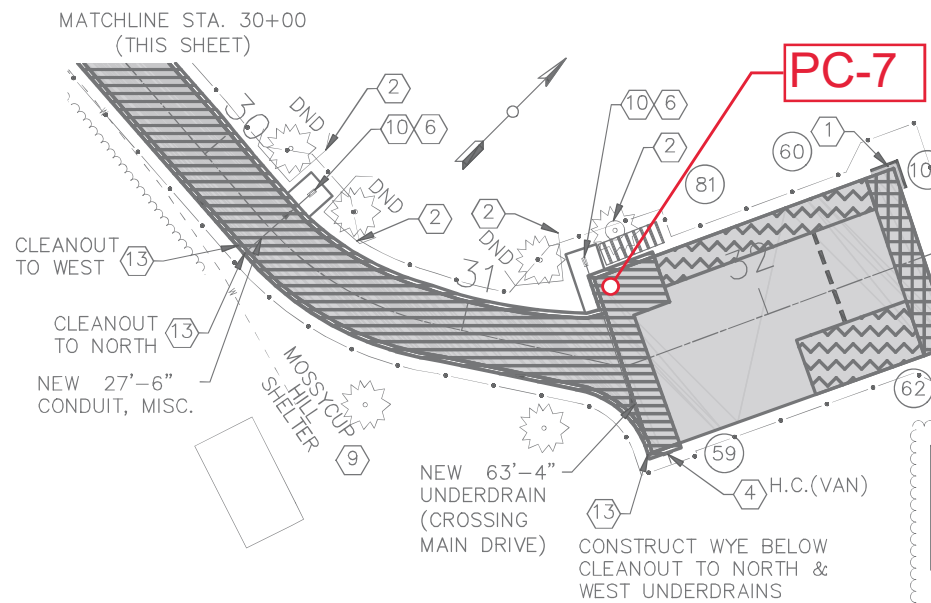
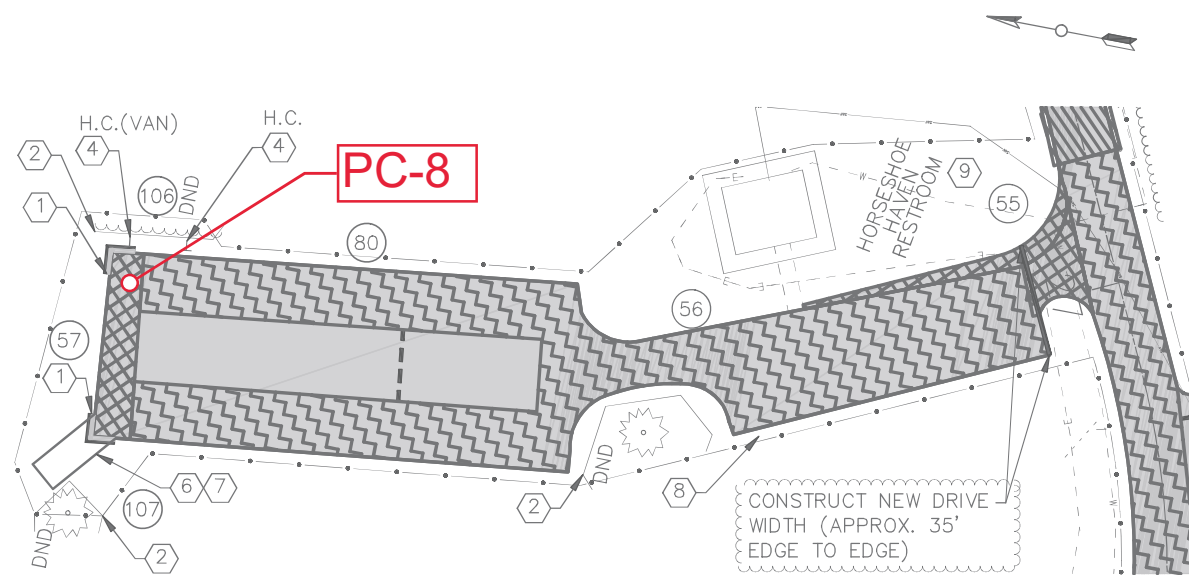
1. CONSTRUCT TIED CONCRETE BLOCK MAT, STANDARD FLEXAMAT WITHOUT UNDERLAYMENT (OR EQUAL), 4'-WIDE BY LENGTH SHOWN
2. CONSTRUCT TREE PROTECTION FENCE
3. REMOVE EX. CONDUIT; CONSTRUCT NEW CONDUIT, (SEE PLAN LENGTHS & SIZE). CONSTRUCT INLET & OUTLET HEADWALLS.
4. ITEM 630 - INSTALL NEW OWNER FURNISHED COMPOSITE SIGN POST. PROVIDE & INSTALL NEW SIGN (SEE ADA PLAN SHEET 16).
5. CONSTRUCT OUTLET PROTECTION WITH TIED CONCRETE BLOCK MAT, STANDARD FLEXAMAT WITHOUT UNDERLAYMENT (OR EQUAL), 5.5'-WIDE BY 6'-BEYOND HEADWALL.
6. GRADE/RESHAPE GRASS AREA PROVIDE 4H:1V SLOPE, (3H:1V MAX) (940 SY)
7. CONSTRUCT EMBANKMENT TO FILL EX. ERODED AREA (15 CY)
8. ITEM 630 - REMOVE EX. SIGN POST & RETURN SIGN TO OWNER.
9. SEE GRADING/ADA PLAN SHEETS (VARIABLE OVERLAY DEPTH)
10. CONSTRUCT HEADWALL (NO OUTLET PROTECTION)
11. CUT EX. CONDUIT 2' BEYOND EDGE OF PAVEMENT; REMOVE CONDUIT UNDER PAVEMENT; FILL & PLUG REMAINING CONDUIT SECTION NEAR TREE.
12. REMOVE AND DISPOSE OF EX. BENCH; EXCAVATE & REMOVE EX. FOOTING, BACKFILL WITH SELECT BACKFILL.
13. REMOVE & RESET EX. SITE FURNISHING (BICYCLE RACK, BENCH)
14. REMOVE & DISPOSE OF EX. TIMBERS ALONG PAVEMENT (APPROX. 40 LF TOTAL)
15. REMOVE ASPHALT OUTSIDE/BEYOND PAVEMENT LANE (5 SY). REGRADE CENTER OF ISLAND (385 SY), PROVIDE POSITIVE DRAINAGE TO NEW CULVERT PIPE.
16. CONSTRUCT NEW CONCRETE TO ACHIEVE ADA COMPLIANT SLOPES ALONG PATH & FOR FUTURE BENCH (ACCESSIBLE ROUTE)
17. STOP BAR MARKING
18. REMOVE EX. CONCRETE, SEE GRADING PLAN (46.2 SY)
19. CONSTRUCT NEW WALK (SEE DETAIL "FD", PEDESTRIAN WALK NOTES)
20. CONSTRUCT VARIABLE OVERLAY FOR POSITIVE DRAINAGE AWAY FROM PAVEMENT (EX. AREA OF PONDING WATER)

PC-4

LEGEND

- SURFACE OVERLAY, LIMITS OF ITEM 441 - ASPHALT CONCRETE SURFACE COURSE, TYPE 1, (448) PG64-22 (SEE DETAIL "SU")
- FULL DEPTH REPAIR (SEE DETAIL "FD")
- PARTIAL DEPTH REPAIR (SEE DETAIL "PD")
- FULL DEPTH REPAIR W/ GEOGRID & AGGREGATE BASE (SEE DETAIL "GR")
- LIMITS OF ITEM 423 - CRACK SEALING, TYPE 2, & ITEM 886 - FOG SEAL
- STRESS-ABSORBING MEMBRANE INTERLAYER (SAMI), 24" WIDE, APPROXIMATE LOCATION (SEE GEN. NOTES)
- TREE PROTECTION FENCE, DND (DO NOT DISTURB) (SEE GEN. NOTES & DETAILS)
- TREE PROTECTION WRAP AROUND EXIST. TREE (SEE GEN. NOTES & DETAILS)
- TREE PROTECTION MAT PLACED ON GRADE (SEE GEN. NOTES & DETAILS)
- HEADWALL (SEE DETAILS)
- TIED-CONCRETE BLOCK MAT (TCBM), STANDARD FLEXAMAT WITHOUT UNDERLAYMENT, OR EQUAL (SEE DETAILS)
- LIMITS OF CONSTRUCTION
- SHOULDER
- HANDICAP PARKING (SEE ADA PLAN SHEET DETAIL)
- MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES
- CONCRETE PAVEMENT (SEE GEN. NOTES & DETAILS SHEET 3)

PAVEMENT CORE LOCATION PLAN (APPROX. LOCATION)



- CODING NOTES PART 1 PART 2 ALSO REF. # DENOTES PART 1 & REF. #b PART 2**
1. CONSTRUCT TIED CONCRETE BLOCK MAT, STANDARD FLEXAMAT WITHOUT UNDERLAYMENT (OR EQUAL), 4'-WIDE BY LENGTH SHOWN
 2. CONSTRUCT TREE PROTECTION FENCE
 3. REMOVE EX. CONDUIT; CONSTRUCT NEW CONDUIT, (SEE PLAN LENGTHS & SIZE). CONSTRUCT INLET & OUTLET HEADWALLS.
 4. ITEM 630 - INSTALL NEW OWNER FURNISHED COMPOSITE SIGN POST. PROVIDE & INSTALL NEW SIGN (SEE ADA PLAN SHEET 16).
 5. CONSTRUCT OUTLET PROTECTION WITH TIED CONCRETE BLOCK MAT, STANDARD FLEXAMAT WITHOUT UNDERLAYMENT (OR EQUAL), 5.5'-WIDE BY 6'-BEYOND HEADWALL.
 6. GRADE/RESHAPE GRASS AREA PROVIDE 4H:1V SLOPE, (3H:1V MAX) (270 SY)
 7. CONSTRUCT EMBANKMENT TO FILL EX. ERODED AREA (15 CY)
 8. ITEM 630 - REMOVE EX. SIGN POST & RETURN SIGN TO OWNER.
 9. SEE GRADING/ADA PLAN SHEETS (VARIABLE OVERLAY DEPTH)
 10. CONSTRUCT HEADWALL (NO OUTLET PROTECTION)
 11. CUT EX. CONDUIT 2' BEYOND EDGE OF PAVEMENT; REMOVE CONDUIT UNDER PAVEMENT; FILL & PLUG REMAINING CONDUIT SECTION NEAR TREE.
 12. EX. CONCRETE BLOCKS AT THIS DRIVE TO REMAIN.
 13. CONSTRUCT CLEANOUT FROM UNDERDRAIN UP TO FINISHED GRADE
 14. CONSTRUCT NEW CONCRETE, SEE GRADING PLAN (98 SF)
 15. CONSTRUCT VARIABLE OVERLAY FOR POSITIVE DRAINAGE AWAY FROM PAVEMENT (EX. AREA OF PONDING WATER)

"M-" DENOTES MAIN DRIVE

DESC.	Ref #	Area (SF)
PD	M- 51	3841
GR	M- 52	643
FD	53	183
PD	54	6753
FD	55	706
PD	56	9168
FD	57	630
GR	M- 58	8079
GR	M- 59	672
PD	60	704
FD	61	544
PD	62	652
SU	M- 79	22939
SU	80	13322
SU	81	5778
SHLD	M- 89	183
SHLD	M- 90	649
SHLD	M- 91	665
TCBM	106	15
TCBM	107	15
TCBM	108	15
TCBM	109	15

LEGEND

- SURFACE OVERLAY, LIMITS OF ITEM 441 - ASPHALT CONCRETE SURFACE COURSE, TYPE 1, (448) PG64-22 (SEE DETAIL "SU")
- FULL DEPTH REPAIR (SEE DETAIL "FD")
- PARTIAL DEPTH REPAIR (SEE DETAIL "PD")
- FULL DEPTH REPAIR W/ GEOGRID & AGGREGATE BASE (SEE DETAIL "GR")
- LIMITS OF ITEM 423 - CRACK SEALING, TYPE 2, & ITEM 886 - FOG SEAL
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- TREE PROTECTION MAT PLACED ON GRADE (SEE GEN. NOTES & DETAILS)
- HEADWALL (SEE DETAILS)
- TIED-CONCRETE BLOCK MAT (TCBM), STANDARD FLEXAMAT WITHOUT UNDERLAYMENT, OR EQUAL (SEE DETAILS)
- LIMITS OF CONSTRUCTION
- SHLD SHOULDER
- H.C. HANDICAP PARKING (SEE ADA PLAN SHEET DETAIL)
- MUTCD MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES
- CONCRETE PAVEMENT (SEE GEN. NOTES & DETAILS SHEET 3)

PAVEMENT CORE LOCATION PLAN (APPROX. LOCATION)



SITE PHOTOGRAPHS





Site Photograph 1. Pavement Core PC-1 (photograph taken December 1, 2022).



Site Photograph 2. Pavement Core PC-2 (photograph taken December 1, 2022).



Site Photograph 3. Pavement Core PC-3 (photograph taken December 1, 2022).



Site Photograph 4. Pavement Core PC-4 (photograph taken December 1, 2022).



Site Photograph 5. Pavement Core PC-5 (photograph taken December 1, 2022).



Site Photograph 6. Pavement Core PC-6 (photograph taken December 1, 2022).



Site Photograph 7. Pavement Core PC-7 (photograph taken December 1, 2022).



Site Photograph 8. Pavement Core PC-8 (photograph taken December 1, 2022).



PAVEMENT CORE PHOTOGRAPHS





Pavement Core Photograph 1. Pavement Core PC-1.



Pavement Core Photograph 2. Pavement Core PC-2.



Pavement Core Photograph 3. Pavement Core PC-3.



Pavement Core Photograph 4. Pavement Core PC-4.



Pavement Core Photograph 5. Pavement Core PC-5.



Pavement Core Photograph 6. Pavement Core PC-6.



Pavement Core Photograph 7. Pavement Core PC-7.



Pavement Core Photograph 8. Pavement Core PC-8.
